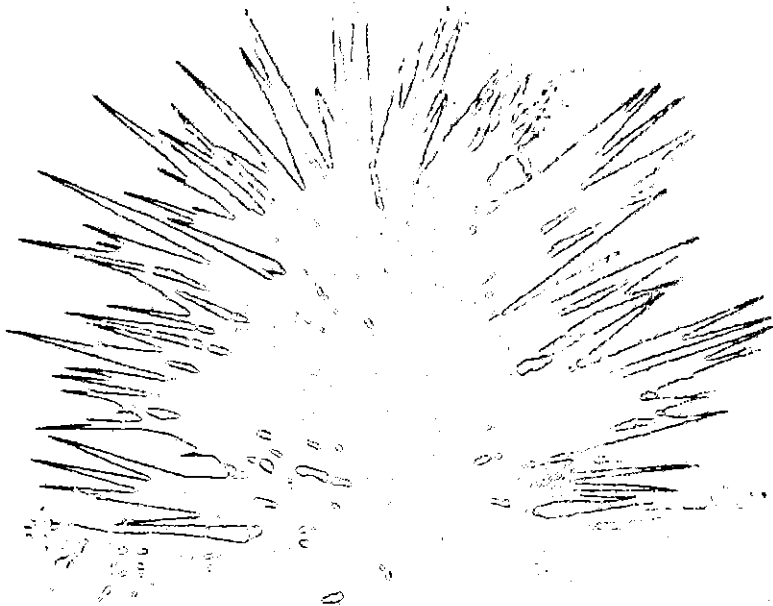


The University of Texas



at El Paso



BULLETIN
1973-74

THE UNIVERSITY OF TEXAS AT EL PASO

1973-74

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STATEMENT OF EQUAL EDUCATIONAL OPPORTUNITY

With respect to the admission and education of students, with respect to the availability of student loans, grants, scholarships, and job opportunities, with respect to the employment and promotion of teaching and non-teaching personnel, with respect to the student and faculty activities conducted on premises owned or occupied by the University, and with respect to student and faculty housing situated on premises owned or occupied by the University, The University of Texas at El Paso shall not discriminate either in favor of or against any person on account of his or her creed, color, or national origin.

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CATALOG

The University of Texas at El Paso

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SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS

TEXAS ASSOCIATION OF COLLEGES

TEXAS ASSOCIATION OF GRADUATE SCHOOLS

BUSINESS

EDUCATION

ENGINEERING

LIBERAL ARTS

SCIENCES

GRADUATE STUDY

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CALENDER FOR FALL SEMESTER — 1973

SEPTEMBER							OCTOBER							NOVEMBER							DECEMBER									
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S			
						1			1	2	3	4	5	6							1	2	3							1
2	3	4	5	6	7	8	7	8	9	10	11	12	13	4	5	6	7	8	9	10	2	3	4	5	6	7	8			
9	10	11	12	13	14	15	14	15	16	17	18	19	20	11	12	13	14	15	16	17	9	10	11	12	13	14	15			
16	17	18	19	20	21	22	21	22	23	24	25	26	27	18	19	20	21	22	23	24	16	17	18	19	20	21	22			
23	24	25	26	27	28	29	28	29	30	31	25	26	27	28	29	30	23	24	25	26	27	28	29							
30																														

AUGUST

- 29—New Student Convocation — Magoffin Auditorium.
General Faculty Meeting — Union Theater
Preplacement and Advanced Credit Examinations.
- 30-31—Registration Activities

SEPTEMBER

- 3—Labor Day — Holiday
- 4—Classes Begin
- 10—Last day of late registration; last day to add a course.
- 28—Last day to drop a course with an automatic W.

NOVEMBER

- 7-21—Registration for 1974 Spring Semester
- 22-23—Thanksgiving Holidays
- 26—Last day to drop a course without withdrawing from the University.
- 30—Last day for new students to submit application for 1974 Spring Semester.

DECEMBER

- 8—Last day to officially withdraw from the University.
- 15-21—Final Examination for 1973 Fall Semester.
- 22-Jan. 8—Christmas Recess.

CALENDAR FOR SPRING SEMESTER — 1974

JANUARY

- 9—New Student Convocation — Magoffin Auditorium
Preplacement and Advanced Credit Examinations.
- 10-11—Registration Activities
- 14—Classes Begin
- 18—Last day of late registration; last day to add a course.

FEBRUARY

- 8—Last day to drop a course with an automatic W.

MARCH

- 29—Last day for new students to submit applications for admission to 1974 Summer Sessions.

APRIL

- 2-16—Registration for 1974 Summer Sessions and 1974 Fall Semester.
- 5—Last day to drop a course without withdrawing from the University.
- 10-16—Spring Recess.
- 26—Last day to officially withdraw from the University.

MAY

- 4-10—Final Examinations for 1974 Spring Semester.
- 11—Commencement
- 29—New Student Convocation.
- Preplacement and Advanced Credit Examinations.

CALENDAR FOR SUMMER SESSIONS—1974

MAY

- 30-31—Registration activities for 1974 First Summer Session.

JUNE

- 3—Classes Begin
- 6—Last day to add a course
- 14—Last day to drop a course with an automatic W.
- 28—Last day to drop a course without withdrawing from the University.

JULY

- 4—Holiday
- 5—Last day to officially withdraw from the University.
- 10-11—Final Examination for 1974 First Summer Session.
- 12—Preplacement and Advanced Credit Examinations.
- Last day for new students to submit applications for admission to the 1974 Fall Semester.
- 15-16—Second Summer Session registration activities.
- 17—Second Summer Session classes begin.
- 22—Last day to add a course.
- 30—Last day to drop a course with an automatic W.

AUGUST

- 9—Last day to drop a course without withdrawing from the University.
- 16—Last day to officially withdraw from the University.
- 22-23—Final Examinations for 1974 Second Summer Session.

JANUARY							FEBRUARY							MARCH							APRIL										
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S				
			1	2	3	4	5						1	2							1	2				1	2	3	4	5	6
6	7	8	9	10	11	12	3	4	5	6	7	8	9	3	4	5	6	7	8	9	7	8	9	10	11	12	13				
13	14	15	16	17	18	19	10	11	12	13	14	15	16	10	11	12	13	14	15	16	14	15	16	17	18	19	20				
20	21	22	23	24	25	26	17	18	19	20	21	22	23	17	18	19	20	21	22	23	21	22	23	24	25	26	27				
27	28	29	30	31	24	25	26	27	28	29	30	24	25	26	27	28	29	30	28	29	30										
							24	25	26	27	28	31																			

MAY							JUNE							JULY							AUGUST									
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S			
				1	2	3	4						1			1	2	3	4	5	6							1	2	3
5	6	7	8	9	10	11	2	3	4	5	6	7	8	7	8	9	10	11	12	13	4	5	6	7	8	9	10			
12	13	14	15	16	17	18	9	10	11	12	13	14	15	14	15	16	17	18	19	20	11	12	13	14	15	16	17			
19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	27	18	19	20	21	22	23	24			
26	27	28	29	30	31	23	24	25	26	27	28	29	28	29	30	31	25	26	27	28	29	30	31							
							30																							

Board of Regents of The University of Texas System

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Terms Expire 1979

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Chancellor of The University of Texas System

CHARLES A. LEMAISTHE, M.D.

THE UNIVERSITY OF TEXAS AT EL PASO

OFFICERS OF GENERAL ADMINISTRATION

- ARLEIGH B. TEMPLETON, *President*, 1972
B.S., Sam Houston State University;
M.Ed., Ed.D., University of Houston
- LEWIS FREDERICK HATCH, *Vice-President for Academic Affairs*, 1967
B.S., Washington State University; M.S., Ph.D., Purdue University
- MARSHALL LEE PENNINGTON, *Vice-President for Business Affairs*, 1936-49; 1969
B.B.A., The University of Texas at Austin
- GARY DONALD BROOKS, *Vice-President for Student Affairs*, 1968
B.M.E., Millikin University; M.S.Ed., Ed.D., Indiana University
- HALBERT GARVICE ST. CLAIR, *Business Manager*, 1960
B.B.A., The University of Texas at Austin. Certified Public Accountant
- BILL SAMPSON, *Registrar*, 1972
B.S., Brigham Young University
- ROBERT LOUIS SCHUMAKER, *Director of Admissions*, 1946
B.S., The University of Texas at El Paso; M.S., University of Arizona
- DONALD LEE BOSSEAU, *University Librarian*, 1972
B.S., Kansas State University; M.S., University of Kansas; M.L.S., University of Hawaii
- GEORGE COURTNEY MCCARTY, *Director of Athletics*, 1953
B.S., M.A., New Mexico State University

OFFICERS OF ACADEMIC ADMINISTRATION

BUSINESS ADMINISTRATION

- JOHN MARVIN RICHARDS, *Dean*, 1962
B.A., University of Kansas; M.S., Emporia State College;
Ph.D., Louisiana State University
- LAWRENCE PHILLIPS BLANCHARD, *Assistant Dean*, 1959
B.A., J.D., The University of Texas at Austin

EDUCATION

- CYRUS MAYSHARK, *Dean*, 1972
B.A., Williams College; M.Ed., Boston University; M.S. Hyg., Harvard University; H.S.D., Indiana University

ENGINEERING

- RAY WESLEY GUARD, *Dean*, 1970
B.S.M.E., Purdue University; M.S.M.E., Carnegie Institute of Technology;
Ph.D., Purdue University

GRADUATE

- KENNETH EPHRIAM BEASLEY, *Dean*, 1967
B.A., M.A., Ph.D., University of Kansas
- JACK SMITH, *Assistant Dean*, 1964
B.S., M.S., Ph.D., University of Arizona
- THOMAS A. ARCINIEGA, *Assistant Dean*, 1971
B.S., New Mexico State University; M.A., Ph.D., University of New Mexico

LIBERAL ARTS

- RAY SMALL, *Dean*, 1961
B.A., West Texas State University;
M.A., Ph.D., The University of Texas at Austin
- WADE JAMES HARTRICK, *Assistant Dean*, 1944
B.A., Texas Tech University;
M.B.A., Ph.D., The University of Texas at Austin

SCIENCE

- JAMES WILLIAM WHALEN, *Dean*, 1968
A.B., M.S., Ph.D., University of Oklahoma

Date indicates year of original appointment.

LIBRARY ADMINISTRATION

- BAXTER POLK, *Director of Special Collections*, 1936
B.A., Hardin-Simmons University, B.S. in L.S., University of Oklahoma; M.S. in L.S., Columbia University
- MRS. HELEN CARMEN BELL, *Education Librarian*, 1972
B.S.F.S., Georgetown University; M.L.S., George Peabody College
- BARBARA DELL BLAIR, *Acquisitions Librarian*, 1958
B.A., The University of Texas at El Paso; M.L.S., University of Washington
- WALLACE HAWN BRUCKER, *Special Collections Librarian*, 1967
B.S., United States Military Academy
- MRS. ROSEMARY CORCORAN, *Documents Librarian*, 1966
B.A., Manhattanville College
- MRS. YVONNE ETNYNE GREEAR, *Coordinator of Reference Services*, 1964
B.F.A., M.L.S., The University of Texas at Austin
- KENNETH WESLEY HEDMAN, *Assistant University Librarian*, 1969
B.S., The University of Texas at El Paso; M.L.S., University of Washington
- LEON CLAIRE METZ, *University Archivist*, 1967
- FLETCHER CAMPBELL NEWMAN, *Science Librarian*, 1969
B.A., The University of Texas at El Paso; M.L.S., Immaculate Heart College
- MRS. INEZ NINNA SCHWEER, *Circulation Librarian*, 1964
- EDWARD EARL WEIR, *Assistant to the University Librarian*, 1963
- MRS. JACQUELINE WILLINGHAM, *Chief Catalog Librarian*, 1959
B.A., The University of Texas at El Paso; M.L.S., Texas Woman's University
- MRS. ANNE WISE, *Serials Librarian*, 1967
B.S., Dickinson College

OTHER ADMINISTRATIVE OFFICERS

- EVAN HAYWOOD ANTONE, *Director/Editor of Texas Western Press*, 1967
B.A., M.A., The University of Texas at El Paso;
M.A., Ph.D., University of California at Los Angeles
- THOMAS A. ARCINIEGA, *Advisor to the President for Disadvantaged Students*, 1971
B.S., New Mexico State University; M.A., Ph.D., University of New Mexico
- JOSE FERNANDO AVILA, *Assistant Dean of Students*, 1971
B.S., M.E., The University of Texas at El Paso
- JAMES BYRON BACON, *Director of Contracts and Grants*, 1964
B.S., M.A., The University of Texas at El Paso
- JACK BAKER, JR., *The Union Director*, 1969
B.S., Oklahoma State University
- MAX CARLTON BOLEN, *Coordinator of Science Education*, 1965
B.A., Wabash College; M.S., Purdue University;
Ph.D., Texas A&M University
- MRS. JAMIE ANDREWS BOWEN, *Director of Institutional Studies*, 1971
B.A., The University of Texas at Austin; M.S., The University of Texas at El Paso
- THOMAS MILLER CHISM, *Director of Freshman Services*, 1966
B.A., Carson Newman College;
B.D., Southwestern Baptist Theological Seminary; M.A., Phillips University

OFFICERS OF ADMINISTRATION

- FRANK CIRIZA, *Project Director of High School Equivalency Program*, 1970
 B.S., M.S., The University of Texas at El Paso
- MRS. PHYLLIS MATTHEWS CLARK, *Director of International Student Services*, 1971
 B.A., New Jersey State Teachers' College at Montclair
- JOSEPH A. DELLA MALVA, *Director of Student Publications*, 1970
- JOHN THOMAS EVANS, *Director of Financial Aid and Placement*, 1966
 B.A., Washington State University
- REX ERVIN GERALD, *Director of Museum*, 1958
 B.A., University of Arizona; M.A., University of Pennsylvania
- EUGENE WENDELL GREEN, *Director of Personnel*, 1965
 B.S., University of Maryland; M.Litt. University of Pittsburgh
- LLOYD LORENZO LEECH, JR., *Director of Development*, 1972
 B.S., Virginia Military Institute; M.S., University of Illinois
- CURTIS HAROLD LYMAN, *Director of Health Services*, 1968
 B.A., The University of Texas at El Paso;
 M.D., The University of Texas Medical Branch at Galveston
- MRS. JUNE MARQUEZ, *Assistant to the Business Manager*, 1949
- WALTER DANIEL MCCOY, *Associate Dean of Students*, 1970
 B.S., The University of Texas at El Paso;
 M.S.Ed., The University of Texas at El Paso
- HERBERT CLARK MORROW, JR., *Curator, Museum*, 1969
 B.A., M.A., University of Arizona
- GLENN LLOYD PALMORE, *Director of Bureau of Business and Economic Research*,
 1971
 B.S., University of Maryland; M.B.A., D.B.A., University of Oklahoma
- JAMES COLEMAN PARKER, *Director, The Center for Continuing Education*, 1972
 B.S., University of Alabama; M.Ed., University of Virginia
- DONALD LEONARD PAULSON, *Director of University Counseling Service*, 1972
 B.A., Hamline University; M.S. Ed., Indiana University; Ph.D., University
 of Iowa
- MRS. JANE WEYMAN PECK, *Supervisor of Health Service*, 1959
 R.N., University of Cincinnati School of Nursing and Health
- FRANCIS JAVIER PUIG, *Physician Consultant*, 1971
 M.D., Havana University
- JAMES BLANCHETTE REEVES, *Coordinator of Health Related Programs*, 1955
 B.S., M.S., Louisiana State University; Ph.D.,
 The University of Texas at Austin
- MRS. LOUISE FLETCHER RESLEY, *Assistant Dean of Students*, 1940
 B.A., The University of Texas at El Paso;
 M.A., The University of Texas at Austin
- MRS. JOY MORGAN RILEY, *Executive Assistant to the President*, 1964
- STEVE ROBERT ROSENFELD, *Director of Student Activities*, 1969
 B.B.A., The University of Texas at El Paso
- SAMUEL WARREN SCOTT, JR., *Director of Computation Center*, 1970
 B.Sc.E.E., M.B.A., New Mexico State University
- CYRIL BERT SHERIFF, *Director of Physical Plant*, 1971
 B.S., University of Oklahoma
- CURTIS JOSEPH SPIER, *Psychiatric Consultant*, 1969
 B.A., The University of Texas at El Paso
 M.D., The University of Texas (Southwestern) Medical School at Dallas
- WILLIAM NEIL TIDWELL, *Assistant Business Manager*, 1964
 B.B.A., The University of Texas at El Paso
- DALE WALKER, *Director of News and Information*, 1966
 B.A., The University of Texas at El Paso

THE FACULTY

- LONNIE LEE ABERNETHY, *Professor of Metallurgical Engineering*, 1963
B. Cer.E., North Carolina State University;
M.Sc., Ph.D., Ohio State University. Registered Professional Engineer
- MRS. LYDIA ROSALVA ACUIRRE, *Lecturer in Sociology*, 1972
B.S., M.S.W., The University of Texas at Austin
- MRS. MARY LOUISE ZANDER AHO, *Assistant Professor of Curriculum and Instruction*, 1963
B.S.E., University of Florida; M.A., The University of Texas at El Paso;
Ph.D., Florida State University
- HAROLD EDWIN ALEXANDER, *Professor of Chemistry*, 1955
B.S., The University of Texas at El Paso;
M.A., Ph.D., The University of Texas at Austin
- JOSEPH L. ALLEN, *Instructor in Religion*, 1970
B.A., M.A., Ph.D., Brigham Young University
- EVAN HAYWOOD ANTOINE, *Assistant Professor of English*, 1967
B.A., M.A., The University of Texas at El Paso;
M.A., Ph.D., The University of California at Los Angeles
- HOWARD GEORGE APPLGATE, *Professor of Civil Engineering*, 1970
B.S., M.S., Colorado State University; Ph.D., Michigan State University
- THOMAS A. ARCINIEGA, *Associate Professor of Educational Administration*, 1971
B.S., New Mexico State University; M.A., Ph.D., University of New Mexico
- JOHN CLEVELAND ARNOLD, *Assistant Professor of Art*, 1965
B.A., University of Minnesota; M.F.A., Arizona State University
- GLORIA CABALLERO ASTIAZARAN, *Assistant Professor of Modern Languages*, 1967
B.A., M.A., Ph.D., University of Arizona
- H. HOLLIE ATKINSON, *Instructor in Religion*, 1965
B.A., East Texas Baptist College; B.D., Southwestern Baptist Theological Seminary
- MICHAEL EVAN AUSTIN, *Associate Professor of Electrical Engineering*, 1963
B.S.E.E., M.S.E.E., Ph.D., The University of Texas at Austin
- GEORGE WESTON AYER, *Professor of Modern Languages*, 1969
A.B., Harvard College;
M.A., University of the Americas; Doctorat d'Université, University of Paris
- JAMES BYRON BACON, *Assistant Professor of Mechanical Engineering*, 1964
B.S., M.S., The University of Texas at El Paso
- FREDERICK HOMER BAILEY, *Assistant Professor of Mathematics*, 1963
B.S., West Texas State University; B.S., Ph.D., Texas A&M. University
- JACK SEARCY BAILEY, *Assistant Professor of Modern Languages*, 1963
B.A., The University of Texas at El Paso; M.A., University of Arizona
- KENNETH KYLE BAILEY, *Professor of History*, 1960
B.A., M.A., Ph.D., Vanderbilt University
- RICHARD DARRELL BAKER, *Instructor in Civil Engineering*, 1971
B.S., West Texas State University; B.S., Ph.D., Texas A&M University
- HOWARD WOOSTER BALDWIN, *Instructor in Modern Languages*, 1965
B.S., Rutgers University; M.A., The University of Texas at El Paso
- STANLEY EUGENE BALL, *Assistant Professor of Curriculum and Instruction*, 1964
B.S., University of Wyoming; M.S., University of Arizona; Ph.D., New Mexico State University
- WILLIAM GERALD BARBER, *Professor of Educational Administration*, 1967
B.S., M.S., East Texas State University; Ed.D., University of Houston
- THOMAS GROCARD BARNES, *Professor of Physics*, 1938
B.A., Sc.D. (Hon.), Hardin-Simmons University; M.S., Brown University
- GUIDO ALAN BARRIENTOS, *Associate Professor of Psychology*, 1963
B.A., Universidad de San Carlos (Guatemala); M.A., Ph.D., University of Kansas
- HERBERT HERMAN BARTEL, JR., *Professor of Civil Engineering*, 1972
B.S.C.E., Southern Methodist University; M.S.C.E., The University of Texas at Austin; Ph.D., Texas A&M University

- CHARLES RICHARD BATJI, *Assistant Professor of Political Science*, 1966
B.A., University of Nevada; M.A., Ph.D., Tulane University
- ALLEN OSCAR BAYLOR, *Professor of Business*, 1965
B.A., Licence en Droit et Economie Politique, American College, Teheran;
Doctorat ès Sciences Mathématiques et Statistiques, University of Lausanne;
D.P.A., Ph.D., University of Southern California
- KENNETH EPHRIAM BEASLEY, *Professor of Political Science*, 1967
B.A., M.A., Ph.D., University of Kansas
- RALPH PORTER BENITZ, *Associate Professor of Mathematics*, 1952
B.S., West Chester State College; M.Ed., Pennsylvania State University,
Ph.D., George Peabody College
- PHILIP HIGLEY BETHUNE, *Instructor in Political Science*, 1967
B.S., United States Military Academy; M.A., Southern Methodist University
- CALEB ARUNDEL BEVANS, *Professor of Modern Languages*, 1950
B.S., Northwestern University; M.A., Ph.D., University of Chicago
- MRS. SANDRA STEWART BEYER, *Assistant Professor of Modern Languages*, 1972
B.A., Wichita State University; M.A., M.Phil., University of Kansas
- SACHINDRANARAYAN BHADURI, *Associate Professor of Mechanical Engineering*, 1963
B.A., Calcutta University (India); B.A., Calcutta University (India);
M.S. in M.E., State University of Iowa; M.E.S., Johns Hopkins University;
Ph.D., Colorado State University
- SALLY MITCHELL BISHOP, *Assistant Professor of Art*, 1967
B.F.A., M.F.A., Wichita State University
- LAWRENCE PHILLIPS BLANCHARD, *Associate Professor of Business*, 1959
B.A., J.D., The University of Texas at Austin
- LELAND THOMAS BLANK, *Assistant Professor of Mechanical Engineering*, 1970
B.S.I.E., St. Mary's University; M.S., Ph.D., Oklahoma State University
- EDWARD LEE BLANSITT, JR., *Professor of Linguistics*, 1967
Ph.D., The University of Texas at Austin
- ROBERT TERRELL BLEDSOE, *Assistant Professor of English*, 1971
A.B., Harvard University; M.A., University of Kent at Canterbury;
Ph.D., Princeton
- MICHAEL HENRY BLUE, *Associate Professor of Physics*, 1964
B.S., Colorado State University; Ph.D., University of Washington
- MAX CARLTON BOLEN, *Professor of Physics*, 1965
B.A., Wabash College; M.S., Purdue University; Ph.D., Texas A. & M. University
- MRS. JOAN HELEN BORNSCHEUER, *Assistant Professor of Modern Languages*, 1969
B.A., University College of London; Ph.D., The University of Texas at Austin
- GERALD RAYMOND BOVARD, *Associate Professor of Accounting*, 1964
B.S., Grove City College; M.L.Ind., University of Pittsburgh; C.P.A.
- DONALD EDGAR BOWEN, *Professor of Physics*, 1966
B.A., M.A., Texas Christian University; Ph.D., The University of Texas at Austin
- DELMAR LEE BOYER, *Professor of Mathematics*, 1965
B.A., Kansas Wesleyan University; M.A., Ph.D., University of Kansas
- HALDEEN BRADY, *Professor of English*, 1946
B.A., East Texas State University; M.A., The University of Texas at Austin;
Ph.D., New York University
- MRS. MADELINE BRAND, *Assistant Professor of Drama and Speech*, 1968
B.A., University of Toronto; M.A., Columbia University
- MICHAEL BRAND, *Associate Professor of Economics*, 1958
B.A., University of Washington; M.A., University of Colorado
- JAMES TERRY BRATCHER, *Instructor in English*, 1969
B.A., M.A., Texas Christian University
- FRED MEZA BREWER, *Assistant Professor of Modern Languages*, 1955
B.A., University of New Mexico; M.A., The University of Texas at El Paso
- SAMUEL JOHN BRIENT, JR., *Associate Professor of Physics*, 1962
B.S., Ph.D., The University of Texas at Austin
- ERNEST ENRIQUE BRIONES, JR., *Instructor in Philosophy*, 1972
B.A., The University of Texas at El Paso; M.A., Notre Dame University

The University of Texas at El Paso

- JOHN RICHARD BRISTOL, *Assistant Professor of Biological Sciences*, 1970
B.A., Cornell College; M.A., Ph.D., Kent State University
- JOHN MORGAN BROADDUS, JR., *Assistant Professor of History*, 1954
B.A., M.A., The University of Texas at El Paso
- BONNIE SUE BROOKS, *Associate Professor of Educational Psychology and Guidance*, 1968
B.M.E., Millikin University; M.S.Ed., Ed.D., Indiana University
- GARY DONALD BROOKS, *Associate Professor of Educational Administration*, 1968
B.M.E., Millikin University; M.S. Ed., Ed.D., Indiana University
- MRS. DALLAS ANN BROWN, *Instructor in Radio and Television*, 1971
B.A., The University of Texas at El Paso
- IRVING RAYMOND BROWN, *Instructor in Sociology*, 1969
B.A., The University of Texas at El Paso; M.A., New Mexico State University
- RUFUS E. BRUCE, JR., *Associate Professor of Physics*, 1966
B.S., Louisiana State University; M.S., Ph.D., Oklahoma State University
- MRS FLORENCE BUCKNER, *Assistant Professor of Accounting*, 1947
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- RICHARD D. CALLACHAN, *Instructor in English*, 1972
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- ALBERT GEORGE CANARIS, *Professor of Biological Sciences*, 1970
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- EDWARD CORNELL CLARK, *Assistant Professor of History*, 1969
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- KENTON J. CLYMER, *Assistant Professor of History*, 1970
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 B.S., College of the Holy Cross; A.B., University of Illinois;
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 B.A., Whitworth College; M.Div., Princeton Theological Seminary
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 Laurea, Università degli Studi, Turin
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 B.S.M.E., M.S.M.E., Ph.D., Syracuse University
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- DANIEL JOE FLAHERTY, *Assistant Professor of Accounting*, 1973
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 B.M., University of North Carolina at Greensboro; M.M., Northwestern University;
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 B.S., Texas A&M University; M.Ed., Southwest Texas State University;
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 B.S., Austin College; M.B.A., North Texas State University
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- CARLOS ARMANDO GARCIA, *Visiting Associate Professor of Curriculum and Instruction*, 1971
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B.A., Texas A&M University, Major, U. S. Army
- CLARKE HENDERSON GARNSEY, *Professor of Art*, 1966
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- RICHARD LINO LANDY, *Assistant Professor of Modern Languages*, 1969
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S.B., S.M., Ph.D., Massachusetts Institute of Technology
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B.S., University of Maryland; M.B.S., D.B.A., University of Oklahoma
- KEITH HOWARD PANNELL, *Associate Professor of Chemistry*, 1971
B.Sc., M.Sc., University College, Durham University; Ph.D., University of Toronto
- CYRIL PARKANYI, *Professor of Chemistry*, 1969
M.S., R.N.Dr., Charles University, (Prague);
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- ANDREAS NICOLAOU PHILIPPOU, *Assistant Professor of Mathematics*, 1972
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B.A., M.A., University of Toronto
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B.A., University of Kansas; Ph.D., The University of Texas at Austin
- NADINE HALE PRESTWOOD, *Lecturer in Educational Psychology and Guidance*, 1966
B.A., M.A., M.Ed., The University of Texas at El Paso
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B.S., College of Charleston; M.A., University of Chicago;
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B.S., M.S., The University of Texas at El Paso
- RALPH HARPER PRYOR, *Instructor in Mathematics*, 1961
B.S., Michigan State University; M.S., Johns Hopkins University
- MRS. JOAN PHELAN QUAHM, *Assistant Professor of English*, 1957
B.A., Reading University (England); M.A., San Francisco State College
- HOWARD EDMUND QUINN, *Professor Emeritus of Geology*, 1924
E.M., M.S., University of Minnesota; Ph.D., Harvard University
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B.S., Ph.D., University of Louisville
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B.S.S., Loyola University of New Orleans, Captain, U. S. Army
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B.A., Pomona College; M.A., Ph.D., University of California at Los Angeles
- MRS. ROBERTA WALKER, *Assistant Professor of English*, 1964
B.A., M.A., The University of Texas at El Paso
- JOHN LEROY WALLER, *Professor Emeritus of History*, 1931
B.S., University of Oklahoma; M.A., University of Colorado;
Ph.D., The University of Texas at Austin
- SARAH BEAL WATLEY, *Instructor in Sociology*, 1972
B.A., M.A., Texas Tech University
- ROBERT GRAVEM WEBB, *Professor of Biological Sciences*, 1962
B.S., M.S., University of Oklahoma; Ph.D., University of Kansas
- WILLIAM FLETCHER WEBB, *Associate Professor of Modern Languages*, 1945
B.A., M.A., The University of Texas at Austin
- JOHN OLIVER WEST, *Professor of English*, 1963
B.A., Mississippi College; M.A., Texas Tech University;
Ph.D., The University of Texas at Austin
- JAMES WILLIAM WHALEN, *Professor of Chemistry*, 1968
A.B., M.S., Ph.D., University of Oklahoma
- JOHN AUBREY WHITACRE, JR., *Professor of Mechanical Engineering*, 1959
B.S., M.S., Texas A&M University. Registered Professional Engineer
- MRS. DOOTHY JEAN WHITE, *Assistant Professor of English*, 1965
B.A., University of Chicago; M.A., University of Missouri at Kansas City
- * JON MANCHIP WHITE, *Associate Professor of English*, 1967
B.A., Saint Catherine's College (England);
M.A., University of Cambridge (England)
- RANDOLPH HOWARD WHITWORTH, *Associate Professor of Psychology*, 1960
B.S., Ph.D., The University of Texas at Austin
- HAROLD N. WILLIAMS, *Professor of Drama and Speech*, 1969
B.S., M.S., Ed.D., Bradley University
- JOHN SIMEON WILLIAMS, *Associate Professor of Biological Sciences*, 1961
B.S., Texas A&M University;
M.A., University of Missouri; Ph.D., University of Nebraska
- PAUL IRVIN WILLIAMS, *Assistant Professor of Psychology*, 1968
B.A., Ph.D., The University of Texas at Austin
- GIFFORD WENDEL WINGATE, *Professor of Drama and Speech*, 1964
B.A., M.A., New York State College for Teachers; Ph.D., Cornell University
- JAMES ALLEN WOOD, *Associate Professor of Drama and Speech*, 1966
B.A., Willamette University; Ph.D., Cornell University
- RICHARD DANE WORTHINGTON, *Assistant Professor of Biological Sciences*, 1969
B.A., The University of Texas at Austin; M.S., Ph.D., University of Maryland
- DANIEL LANDSAW WRIGHT, *Assistant Professor of Music*, 1972
B.M., Oklahoma City University; M.M., Indiana University
- PHILIP WAYNE YOUNG, *Associate Professor of Civil Engineering*, 1957
B.S.C.E., The University of Texas at El Paso;
M.E.S.E., Texas A&M University. Registered Professional Engineer
- HECTOR MANUEL ZAVALETA, *Assistant Professor of Business*, 1972
B.A., The University of Texas at El Paso; J.D., The University of Texas at Austin
- NATHAN ZIRL, *Lecturer in Sociology*, 1972
B.A., Long Island University; M.S.W., New York School of Social Work at
Columbia University
- PAUL DAVID ZOOK, *Professor of Economics*, 1970
B.A., Goshen College; M.A., Ph.D., University of Illinois



PURPOSE OF THE UNIVERSITY

Through teaching, research and public service, THE UNIVERSITY OF TEXAS AT EL PASO seeks to equip men and women for the professions and for constructive living, and to offer them the opportunity to explore various fields of knowledge freely in an atmosphere of respect for the rights and responsibilities of scholarship and citizenship. It endeavors, through the tools of learning, to develop breadth of mind, tolerance of spirit, and strength of character.

A UNIQUE INSTITUTION

The University of Texas at El Paso differs in many ways from other collegiate institutions and offers experiences and opportunities which cannot be duplicated elsewhere. Its unusual Bhutanese architecture and its setting in the rough foothills of a southern spur of the Rocky Mountains give the campus a special feeling. Even more important is its location just across the *Río Grande* from Juárez, Mexico. The two towns, the largest on the Mexican border, have a combined population of well over three-quarters of a million. Spanish is almost as familiar to El Pasoans as English,



and the grace and charm of Latin ways add flavor to life on the north bank. Mexican food, Mexican music and art, Mexican artifacts, all add zest and color to the pattern of living. At the same time Mexican life is profoundly influenced by the proximity of the Anglo metropolis. More than any other city in the United States El Paso is an international community and its people have an unparalleled opportunity to participate in the life of two nations.

Perhaps because of their remoteness from other large cities, El Paso and Juárez have evolved a way of life, pleasantly tinged with the folkways of long ago, which sets them apart from other cities. The Mexican national holidays interest Americans and Latins alike. At Christmas and New Years *luminarias* outline houses and walks. *Chile con queso* and other Mexican delicacies are served at all parties. Mexican folk dances and the music of *típica* orchestras are standard items of entertainment. Historical societies in both cities keep alive the knowledge of bygone times.

Conscious of its special opportunities, the University has reached into Latin America, sending staff members to the north-Mexican universities and to Colombia and Venezuela, bringing students from these areas to the El Paso campus. Significant strides are being made in setting up programs to prepare teachers of Spanish-speaking students and to improve the quality of instruction in both countries.

In addition to the opportunities described above, there is a special effort to enrich university life by encouraging the enrollment of international students from all the world cultures. Normally there are about 700 graduate and undergraduate students from about fifty different countries studying at the University.

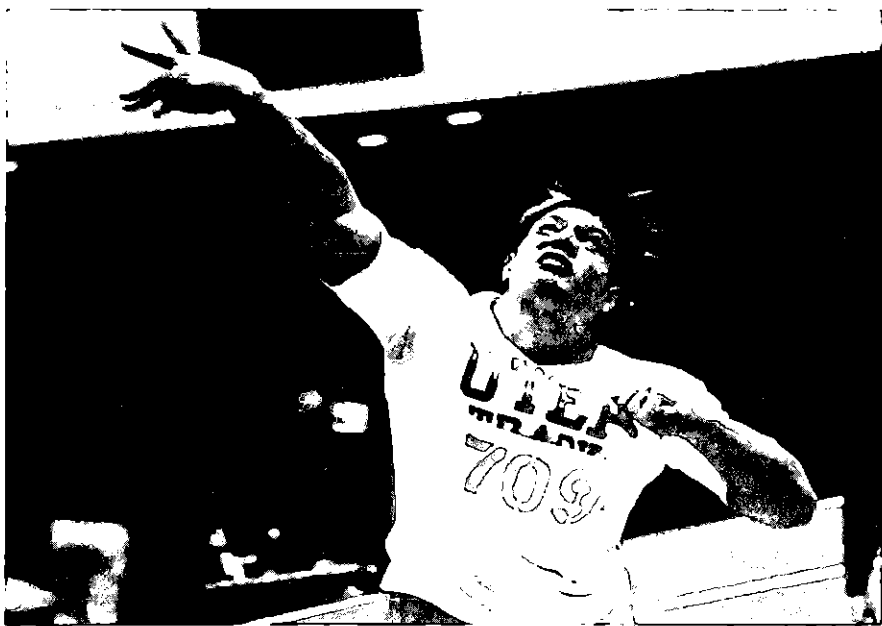
The El Paso Valley is a historic place. Relics of prehistoric Indian cultures are plentiful in the region. Spaniards visited the Pass as early as 1571

and the *Camino Real* — the Royal Road of Spain from Mexico City to Santa Fe — traversed the area after 1598, the year of the first colonizing expedition. The first settlement by Europeans on the Mexican side was made in the 1650's. A century and more ago Anglo trappers and traders came to the old Spanish town and brought it to the attention of the English-speaking world.

Important events occurred here during the Mexican and Civil Wars, but El Paso actually came into its own with the advent of the railroads in 1881. Thereafter it was known in lands far away as a wide-open frontier community with its full quota of gamblers, girls, and gunmen. After 1900 the citizens organized to make their city a clean and decent place and to transform it into a center of commerce, industry, and growing cultural maturity.

Their descendants are proud today of their Art Museum, housing a portion of the great Kress Collection, of their symphony orchestra, their theatre guilds, artists' and writers' societies, concert organizations, and study groups. At the same time the National Frontier Program in Juárez is transforming the cultural climate on the other side of the International Boundary. The Chamizal settlement is improving immensely the appearance of the border area and is promoting international good will as well.

The University itself sponsors a University-Community Opera Guild and a ballet group which offers two major productions each year in addition to its work with the opera presentations. A chamber-music society, a concert band, and recitals of all kinds are organized for campus presentation, along with lectures and symposia by local and visiting specialists.



Science plays its part on and off the campus. Aerospace research receives major emphasis. The world's largest guided-missile school at Fort Bliss sends its top officers to our graduate school, and the White Sands Missile Range, in close association with our Atmospheric Physics program, specializes in atmospheric science. The complex of training facilities and firing ranges stretching northward some 200 miles from El Paso, attracts some of the world's finest scientific minds who enrich the experience of graduates and undergraduates enrolled in the WSMR cooperative Student-Trainee program.

No school in the country is more fortunately located for training in business, industry, and science. There is much to attract the geologist, the paleontologist, the ethnologist, and the archaeologist. A large custom smelter, a modern electrolytic copper refinery, a cement plant, three oil refineries, and several brick plants are in operation near the University, along with manufactories of lime, tile, and other non-metallics, and plants for cotton processing, textile manufacturing, and the packing of meat and vegetables.

THE SCHOOL AND ITS BACKGROUND

The need for technically trained students was responsible for the founding of The University of Texas at El Paso. The Texas Legislature created it in 1913 as the Texas School of Mines and Metallurgy and placed it under control of the Board of Regents of The University of Texas. The City of El Paso furnished a campus and classrooms — formerly the home of the El Paso Military Institute — and the school functioned there from September, 1914, until the buildings were destroyed by fire in 1916. A new campus, with buildings designed in Bhutanese style, was laid out in the present picturesque location when the Legislature appropriated \$100,000 for buildings. In 1919 the School of Mines became a branch of The University of Texas. In 1927 Arts courses were added to the curriculum. In 1931 the Texas College of Mines and Metallurgy began operating under its own president. In 1940 the Master of Arts degree was approved. And in 1949 the name was changed to Texas Western College in recognition of the steady broadening and deepening of the college program. In 1966 the Board of Regents authorized the use of "The University of Texas at El Paso" as the institution's primary title. The name became official in March, 1967.

The institution now offers twelve degrees, a range of courses from Accounting to Zoology, a full program of intramural and intercollegiate athletics, a wide assortment of student activities, plus library, laboratory, classroom, and recreational facilities to go with them.



Endowments, Services, Activities



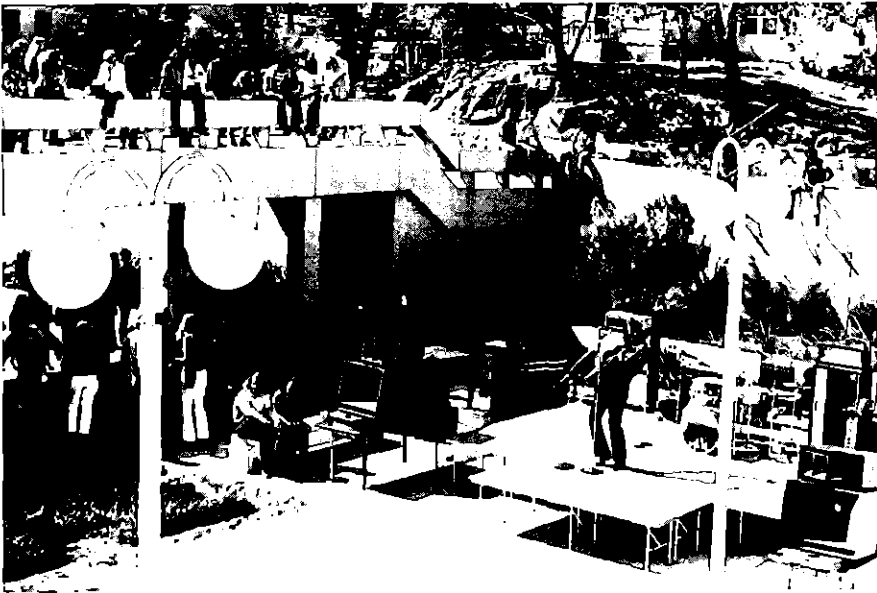
THE LIBRARY is the heart of the University. It contains a rapidly expanding collection of books, periodicals, microfilms, records, and documents. Over 375,000 volumes are housed in stacks. It regularly receives over 2,750 periodicals and about thirty newspapers. Microfilm resources include files of the El Paso *Herald-Post* and *Times*, The New York *Times*, The London *Times* and other important papers; the Juárez and Parral Archives, and other valuable local and regional documents.

The nucleus of the rare-book collection has been provided by Dr. John H. McNeely, a member of the History faculty whose special interest is in Mexico and the Southwest. The collection named for him has been augmented by gifts from other friends of the University. Commonwealth Foundation has made contributions for the purchase of research materials in the Liberal Arts, and further acquisitions have come from the University Excellence Fund.

Inter-library loan arrangements are in effect with other university and state libraries and with the Library of Congress. The institution holds a membership in the Bibliographical Center for Research in Denver.

An extensive addition to the Library and remodeling of the entire facility have increased its capacity and effectiveness enormously.

THE SCHELLENGER RESEARCH LABORATORIES (SRL), created in 1953 under the will of Mrs. Emma L. Schellenger as a memorial to her husband, Newton C. Schellenger, were founded to promote and encourage research in electricity.



SRL specializes in atmospheric and acoustic research and instrumentation. It has investigated virtually every aspect of every parameter of the atmosphere, and has developed specialized instruments for measuring and testing these parameters; some of the instruments are being considered for patents. Studies in the life sciences have included cardiac, dental, and orthopedic research. SRL personnel have journeyed to Antarctica, Hawaii, Puerto Rico, and all over the continental United States for research purposes.

SRL is open to proposals in various fields of the physical sciences, engineering, mathematics, the life sciences, and allied areas, and is able to offer administrative and technical support to all areas of research at The University of Texas at El Paso.

THE EL PASO CENTENNIAL MUSEUM was erected in 1936 with funds allocated by the Commission of Control for the Texas Centennial Celebration. It is devoted to the preservation, documentation, and exhibition of objects and ideas pertaining to the human and natural history of the El Paso del Norte region. Collections include pottery, stone tools, and shell jewelry from the prehistoric ruins of Casas Grandes, Chihuahua; mineral and rock specimens from regional and extra-regional mines; dinosaur bones from the Big Bend; fossil remains from local Ice Age deposits.

In 1959 the Mexican Archaeological Research project was initiated for the purpose of searching out Indian and Spanish sites known to have been occupied in early historic times; in 1961 Museum director Rex E. Gerald discovered the original site of San Elizario, the Spanish fort that was later moved to the Texas location. Currently the 17th-century Mission of Guadalupe in Ciudad Juarez is being investigated.

In 1967 Museum archaeologists participated in the expedition to the Sacred Well of the Maya at Chichen Itza, Yucatan, where underwater excavations uncovered bones of sacrificial victims, and gold, jade, copper, wood, and textile ornaments which accompanied the offerings to the Rain God in the Well.

In order to present information about the present as well as the past, the Museum has constructed a small planetarium in which lectures are given by arrangement. Special exhibits and lectures may be prepared upon request to the Director.

THE CROSS-CULTURAL SOUTHWEST ETHNIC STUDY CENTER was established at the UT El Paso campus in September, 1971 under the Spencer Foundation grant. The center, co-directed by Dr. Jacob Ornstein and Dr. Z. Anthony Kruszewski is devoted to investigating Southwest ethnic group relationships and conflicts. It is also coordinating activities aimed at creating a cultural data bank for illuminating inter-ethnic relationships.

The investigators and consultants represent a broad interdepartmental spectrum from the Departments of Modern Languages, Linguistics, Political Science, Sociology, History, Philosophy, Education, Anthropology and the Inter-American Institute of UT El Paso. They have been conducting research on various aspects of inter-ethnic relationships.

The center utilizes a variety of social science research techniques to collect, analyze and interpret basic cultural data on ethnic groups. The center aims at helping to prepare self-containing units on the Southwest ethnic heritage for inclusion and integration in Liberal Arts courses regularly taught at Southwestern schools and universities. Yearly conferences on Southwest minorities and publishing of proceedings of the conferences are to be undertaken.

THE JOHN W. KIDD MEMORIAL SEISMIC OBSERVATORY is in continuous year-round operation. The station is equipped with a Benioff vertical seismograph and two Benioff horizontal seismographs with complete component recorders for study of both short-period and long-period seismic waves. The records are used for research studies of earthquakes and related phenomena.

THE UNIVERSITY COUNSELING SERVICE, directed by Dr. Donald L. Paulson, offers a complete program of individual and group therapy, academic, vocational, and study-skills counseling, and personality, interest and achievement testing. The Human Resource Center and "Connection" function as evening crisis-counseling and personal growth services available to all members of the University Community. Counseling Service staff are also available to any person in the University Community for consultation in psychological areas such as testing, group processes, personal growth and development, and referral for psychological assistance.

THE EXTENSION SERVICE OF THE UNIVERSITY OF TEXAS AT EL PASO presents short courses or programs to answer community needs for training outside the regular channels of instruction. Although college credit is not granted for extension work, certificates from the University are presented to those who complete the courses.

THE BUREAU OF BUSINESS AND ECONOMIC RESEARCH was set up on the campus in September, 1963, with Dr. John M. Richards in charge. Its object is to maintain a continuous survey of the El Paso economy, to conduct and supervise special studies of interest to the University and the community, and to build up a repository of statistical and analytical information. A monthly report is issued and special papers based on economic research are published from time to time.

BUREAU OF PUBLIC AFFAIRS undertakes organized research both basic and applied concerning public administration and other public-affairs interests. The Bureau also performs routine reporting, advising and

consulting activities in response to state and local government needs in the Southwest. Where special circumstances warrant, the Bureau may contract with local, state and federal governmental agencies to perform problem-solving research and provide appropriate consulting services. Non-credit public-service training for public officials is from time to time offered by the Bureau staff.

THE TEXAS WESTERN PRESS publishes books and monographs of regional and general interest. A series of Southwestern Studies, issued quarterly, is under way, and manuscripts dealing with the Border region and Mexico, written by faculty members and others, are considered for publication by the Publications Board.

THE VETERANS ADMINISTRATION has approved The University of Texas at El Paso as a training center for those eligible for veterans' benefits. Questions about admission, credit, and programs of study should be addressed to the Registrar.

The Director of International Student Services is available to assist the foreign student with problems concerning the pattern of American life, immigration documents, and other problems.

STUDENT SERVICES, in The Union, include a book store, snack bar, meeting rooms, and recreational facilities.

Plays, lectures, and musical performances are presented in Magoffin Auditorium — an air-conditioned building with big-theater stage facilities and modern sound equipment seating 1,600.

Housing for students is provided by six modern and conveniently located dormitories with a capacity of 1,129 students. Meals are served in the University Commons between the two women's dormitories.

Sixty apartments for married students were completed and occupied in the summer of 1963.

Athletic events are held in the Memorial Gymnasium and in the 30,000-seat Sun Bowl.

STATION KTEP-FM (frequency-modulation radio) and KVOF (closed-circuit radio limited to the campus) are owned by the University and staffed entirely by students. KTEP provides daily broadcasting service to city and county schools and to listeners resident on the campus.

The *Television Center* is one of the most complete educational plants in the country. Using three RCA I. O. studio cameras, a vidicon film chain and videotape, students write, direct and produce their own programs as part of their course work.



Endowments & Memorial Funds



The University of Texas at El Paso is indebted to the generosity of private citizens for many fine endowments. These permanent funds, invested under trusteeship of the Regents of The University of Texas System, provide scholarships, purchase library books, underwrite important research, and in many ways enrich the educational experience. The University makes grateful acknowledgement for the following permanent funds.

GRACE ANN BEAL PERMANENT MEMORIAL FUND — Established in memory of Grace Ann Beal by her sister, Miss Virginia Beal, and by friends. The income from this fund provides scholarship aid to pre-medical students and to students of nursing.

CLARENCE J. CERVENKA LOAN FUND—Mr. Cervenka was Registrar and Director of Admissions at the University until his death in 1970. Friends and associates have established a student loan fund in his memory.

C. D. BELDING PERMANENT MEMORIAL FUND — Founded by Mrs. C. D. Belding in memory of her late husband, this fund's income provides scholarships without restriction as to field of study.

ANDY AND SYD COHEN ENDOWMENT FUND—Established by friends of the Cohen brothers. Andy and Syd Cohen are former collegiate and professional athletes, El Paso businessmen, civic leaders and friends of the University. Income from the endowment will be used to provide a scholarship to a deserving student athlete.

FRANK B. COTTON ESTATE FUND — Founded by trustees of the estate of Frank B. Cotton, a Massachusetts manufacturer and investor, the estate's income has provided the University with the Cotton Memorial Building, has afforded financial aid to students, and continues to contribute vitally to the Excellence Program.

BROOKS DAWSON MEMORIAL SCHOLARSHIP—Established in 1970 by friends of a former student who was a prominent football player and student leader. The scholarship will be awarded each year to a student majoring in accounting.

FESSINGER MEMORIAL LECTURE FUND — Created by Mr. and Mrs. Moses D. Springer in memory of Mrs. Springer's parents, Reuben and Leona Fessinger, this fund will be used to bring a nationally recognized lecturer in the Physical Sciences to the University each year.

JOSEPHINE CLARDY FOX FOUNDATION — Established by the bequest of a prominent El Paso woman who left her estate to the University

upon her death in 1970. Mrs. Fox's estate was extensive, including real estate, valuable antiques, paintings, and books, as well as liquid assets. Mrs. Fox established an endowed scholarship fund with a gift of \$20,000, and she created a student loan fund of \$2,500. Her books went to the University Library, and she bequeathed antiques and other valuable items to the Centennial Museum at the University. The remainder of her estate, in accordance with Mrs. Fox's instructions, is an unrestricted endowment, named in her honor.

DAVIS AND BERTHA GREEN PERMANENT ENDOWMENT – The gift of Davis and Bertha Green, this endowment provides scholarships for students majoring in the Sciences.

PERCIVAL HENDERSON PERMANENT ENDOWMENT – The income from the bequest of Percival Henderson provides scholarships for students of Engineering.

LUCY CLAIRE HOARD PERMANENT MEMORIAL FUND – This fund, established by Kappa Chapter, Delta Kappa Gamma, affords scholarship aid to a woman student majoring in Education.

MR. AND MRS. O. B. HOCKER LIBRARY MEMORIAL FUND – Endowed by the bequest of Mrs. O. B. Hocker of El Paso, who died in 1971. Mrs. Hocker created a trust at the El Paso National Bank whose income is to be used by the University to purchase books in her memory and in her husband's memory.

DANIEL L. HILL SCHOLARSHIP – A perpetual scholarship endowed by the family and friends of the late Daniel L. Hill. The endowed scholarship is awarded annually to a deserving student of accounting.

BEN L. JIROU SCHOLARSHIP IN SCIENTIFIC RESEARCH – This endowed scholarship was established in 1969 by Mrs. Ben L. Jirou as a memorial to her husband. The income from the endowment will provide an annual scholarship of approximately \$500 per year to a deserving student in the School of Science. Mr. Jirou, an official of the International Boundary and Water Commission, was a resident of El Paso from 1920 until his death in 1967.

THE GLADYS JOHNSTON MEMORIAL FUND – Established by the will of Miss Gladys Johnston of El Paso, who died in 1971. Miss Johnston bequeathed her estate to the University to create a permanent fund to purchase books and equipment for the Library.

LEASURE MEMORIAL LIBRARY FUND – A tribute to the late James L. Leasure (1952), an alumnus of the University and to his father, L. Vere

Leasure, who was a member of the original (1916) graduating class of the Texas State School of Mines and Metallurgy, this endowment fund is used to buy books for the University Library.

LIBRARY ENDOWMENT – This fund consists of memorial contributions to the *University Library*, which will purchase one book each year for each \$100 contribution. The name of the person in whose memory the contribution is made is placed in the book purchased in his memory. This *endowment contains memorial gifts* made in honor of many alumni and friends. For some of them, one memorial volume is added to the Library each year. For others, several volumes are purchased. In time, the number of volumes bearing the names of the men and women in whose honor these gifts have been made will be substantial.

E. RAY LOCKHART LIBRARY MEMORIAL FUND – Created in 1971 in memory of Mr. Lockhart, a distinguished alumnus who attended the University from 1929 to 1932. The endowment was created by alumni and friends and will purchase engineering books for the Library.

ALVIN J. MARKS MEMORIAL SCHOLARSHIP—Established by the Blaugrund Foundation and the family of the late Alvin J. Marks, El Paso civic leader and businessman. The income from the endowment is used to provide one or more scholarships to students selected by the University.

ELIZABETH CRAM POLK MEMORIAL ENDOWMENT—Established in memory of the wife of former University Librarian Baxter Polk, this endowment is used to purchase books for the library. Mrs. Polk died in 1966.

LLOYD A. NELSON MEMORIAL PROFESSORSHIP IN GEOLOGY—Friends and associates of the late Dr. Lloyd A. Nelson, a distinguished alumnus and a member of the *faculty from 1920 to 1964*, have established a professorship in his honor. The professorship required an endowment of \$100,000.

GORDON PONDER PERMANENT MEMORIAL FUND – This fund was established by Mr. and Mrs. Jack Ponder in memory of their son, who died while a student at The University of Texas at El Paso. Its income is used to purchase books for the University Library.

THE PRESIDENT'S ASSOCIATES ENDOWMENT FUND—This fund was created by the President's Associates, a group of friends of the University who contribute at least \$500 annually to academic programs. Each year one-half of unrestricted gifts from members is transferred to the endowment fund. Income from the endowment is used for academic improvement as determined by the President with approval of the Associates.

VINCENT M. RAVEL COLLECTION OF JUDAICA – A memorial to a prominent El Paso physician who made many contributions to the Library during his lifetime. After his death in 1969, his widow gave to the University their collection of books on Jewish history, culture, and customs. A permanent fund to finance additional purchases for the collection was established by Dr. Ravel's friends.

JULIA ANN ROSS MEMORIAL SCHOLARSHIP – Created by the El Paso school teacher and alumna for whom the scholarship is named. Mrs. Ross bequeathed to the University a portion of her teacher's retirement fund to establish a scholarship endowment to aid qualified students who are in need of financial assistance. There is no restriction as to field of study, and the scholarship is open to men and women who are citizens of the United States.

J. M. ROTH PERMANENT MEMORIAL FUND – Established by the J. M. Roth Society of The University of Texas at El Paso with contributions from the late educator's friends, this fund memorializes a former chairman of the Department of Philosophy and Psychology. Its income provides scholarships to students of Philosophy and Psychology.

EMMA H. SCHELLENGER TRUST—Established under the will of Mrs. Emma H. Schellenger as a memorial to her husband, Newton C. Schellenger. The income from this trust held by the El Paso National Bank is used for support of the Schellenger Research Laboratories.

DAVID WADDELL SCHILLINGER SCHOLARSHIP – A memorial to the son of Mr. and Mrs. William C. Schillinger, this scholarship was established in 1970. The endowment will provide funds each year to a student or students to be selected by the University. The donors have permitted the University almost full discretion in selecting the recipient, requiring only that highest priority be given to financial need.

PATRICIA HEWITT SILENCE MEMORIAL TRUST—This fund was established by the will of Miss Patricia Hewitt Silence of El Paso, who died in 1970. Her heirs created a trust at the El Paso National Bank, the income of which will be used by the University in the furtherance of music and art, particularly art of the Southwest.

THE WILLIAM L. STALEY GRANT FOR RESEARCH INTO THE LIFE SUBSTANCE, a bequest from the late William L. Staley, is administered by Dr. E. W. Rheinheimer and used to support research sponsored by the Schellenger Research Laboratories.

THE LYDIA STARK MEMORIAL SCHOLARSHIP IN SPEECH THERAPY – Established in 1970 in memory of a distinguished El Paso

civic leader and teacher. The scholarship is to assist students who will make speech therapy a career.

LUCILLE T. STEVENS ESTATE FUND — Established by the bequest of Mrs. Lucille T. Stevens, this estate provides income for the University's most valuable scholarship awards. The Stevens Scholarships, in a maximum amount of \$5,000, are directed to male students with outstanding academic records.

LEE TREVINO ENDOWMENT FUND—This endowment was created by professional golfer, Lee Trevino of El Paso. Income from the endowment will be used to provide a scholarship for a deserving student golfer from the United States or Canada.

CAPTAIN JAMES R. VALTR MEMORIAL FUND—An endowed scholarship in memory of Captain Valtr who was killed in action in Vietnam on June 16, 1971. The scholarship is for advanced ROTC students, selected by the Department of Military Science. Captain Valtr was a graduate of the class of 1968.

KATHERINE H. WHITE MEMORIAL LIBRARY FUND—Established by U. S. Congressman Richard C. White of El Paso in memory of his wife, the late Katherine Hope Huffman White, an active, popular and respected social and civic leader, and an alumna of the University. The income of this fund will be used to purchase books for the Library.

B. MARSHALL WILLIS LIBRARY MEMORIAL — This permanent endowment was created in 1968 by friends of B. Marshall Willis, a distinguished alumnus and El Paso business and civic leader. Income from the endowment will purchase books in his memory each year in perpetuity.

ABRAHAM WINTERS — B'NAI B'RITH WOMEN SCHOLARSHIP — In memory of her husband, Mrs. Judith Winters, in conjunction with the B'nai B'rith women, awards a scholarship of at least \$100 per semester to a needy student. The scholarship is endowed through a trust fund established by Mrs. Winters, and additional contributions are made by the B'nai B'rith women.

JUDITH WINTERS SCHOLARSHIP — This endowed scholarship was established by Mrs. Judith Winters of El Paso. It is awarded annually to a qualified and deserving girl student.

MR. AND MRS. WILLIAM HENRY WOOLDRIDGE LIBRARY FUND — Established in 1971 in honor of Mr. and Mrs. W. Henry Wooldridge of

El Paso. The income from the endowment will be used to purchase books for the University Library in their honor.

YSLETA VOLUNTEER FIRE DEPARTMENT SCHOLARSHIP FUND — Maintained for many years by the trustees of this organization and transferred to the University in 1970. The University will continue the trustees' policy of awarding one or more annual scholarships in the amount of \$600 to graduates of Ysleta High School.

HOW TO ENTER THE UNIVERSITY OF TEXAS AT EL PASO

You may enter The University of Texas at El Paso if you are a person of good moral character and a graduate with sixteen acceptable units from an accredited high school and with minimum SAT test scores as outlined in the section on admission requirements. If you did not graduate from high school and are over 21 years of age, it may be possible to qualify for admission under the Individual Approval Program, on the basis of scores obtained on the test of General Education Development (G.E.D.). You may also enter as a transfer student from another college. Admission requirements, including procedures for foreign students, are explained in greater detail later in this bulletin.

If you are a freshman, write the Director of Admissions, The University of Texas at El Paso 79968, for an application and health form and ask your high school principal to mail a complete transcript of your high school work. If you are a transfer student, be sure complete official transcripts are sent reflecting all your previous college work.

Beginning students and transfer students with less than 30 hours must submit scores for the College Entrance Examination Board

Students whose high school class graduated within five years prior to their admission to the University and transfer students with less than 30 hours must submit scores from the College Entrance Examination Board Scholastic Aptitude Test (SAT). You can learn from your high school principal when the examinations will be given.

When you receive your application form for admission, fill it out and mail it to the Director of Admissions. If you meet the entrance requirements, he will send you a notice of acceptance.

All single undergraduate students may live in dormitories on the campus as long as rooms are available. To reserve a place, send a twenty-five dollar deposit to the Housing Office at the University.

The faculty and the staff of the University will make every effort

Your teachers and the staff of the University will make every effort to help you plan your work and get you off to a good start, beginning with the Freshman Guidance and Orientation Activities, which you are required to attend if you are a beginning freshman or a transfer student with less than 30 semester hours. Assemblies and personal conferences will be arranged to acquaint you with the campus and its activities.



Regulations Concerning Registration



Admission to the University is administered by the Director of Admissions. Information pertaining to registration procedures can be found in the current class schedule. Inquiries about registration should be directed to the Registrar's Office, 209 Administration Bldg.

Registration Dates: Students are admitted three times during the year: August, January, and May. (See "Calendar" at front of this catalog for dates.) Applications and transcripts should be submitted at least two months prior to these dates to insure acceptance and to avoid the late penalty and delay in registration.

Student Responsibility: It is the responsibility of each student to know if he is eligible to enroll. If it is later determined that an ineligible student has enrolled, he will be dropped immediately.

A student who is in doubt about his status should consult his academic dean.

Co-Education: Both sexes are admitted to all branches of the University on equal terms regardless of race.

Character: The University is open only to applicants of good moral character.

Health: Each new full-time student shall furnish a physical examination certificate before his registration can be completed. The form may be obtained from the Ad-

missions Office.

Hazing: The law of the State of Texas and the University regulations forbid hazing. Each student is expected to obey the law of the State and conform to the University regulations.

Late Registration: Any student who with proper permission registers in the fall or spring semester after the appointed days for registering in that semester will be required to pay a special charge of \$5.00 for the first late day and \$2.50 for each additional late day to a maximum of \$15.00. Each class missed because of late services required to effect his late registration. Each class missed because of late registration will be counted as an absence, and classroom and laboratory work missed will be counted as zero unless the individual instructor grants the student permission to make up the work. Due to class load limits, closed classes, and other factors, late registrants may expect some delay and difficulty in getting satisfactory programs.

PROCEDURE FOR FOREIGN STUDENTS

In addition to the requirements for admission on the following pages, each foreign student whose native language is not English is required to take the TOEFL (Test of English as a Foreign Language). This test in English proficiency is in lieu of the Scholastic Aptitude Test (SAT) or General Educational Development Test (GED). It must be taken early enough so that the results may be received by the Director of Admissions at least **SIXTY DAYS** before the beginning of the semester.

The *TOEFL Bulletin of Information* and Registration Form can be obtained in a number of cities outside the United States. They often are available at one of the following: American embassies and consulates, offices of the United States Information Service (USIS), United States educational commissions and foundations abroad, and binational centers. In addition, several private organizations distribute TOEFL bulletins, among them (1) the Institute for International Education (IIE) in Nairobi, Kenya; Kowloon, Hong Kong; Paris, France; and Lima, Peru, (2) the African-American Institute in Dar es Salaam, Tanzania; and Lagos, Nigeria, (3) the American Friends of the Middle East in Tehran, Iran; Amman, Jordan; Beirut, Lebanon; Tangier, Morocco; and Cairo, Egypt, (4) the American-Korean Foundation in Seoul, Korea, and (5) the Bureau of Educational Research at Ewing Christian College, Allahabad, U. P. India.

Any student who cannot obtain a TOEFL bulletin and registration form locally should write well in advance for them to: Test of English as a Foreign Language, Box 899, Princeton, New Jersey 08540, U.S.A. Students residing in Taiwan must apply to: Language Center, 2-1 Hsu-chow Road, Taipei, Taiwan, for the special Taiwan editions of TOEFL publications.

A foreign student may obtain an application for admission and also the health form by requesting them from the Director of Admissions.

Each foreign student must have sufficient funds available to finance the entire academic year. The student must furnish a letter from his parents or other sponsor guaranteeing sufficient funds.

The following completed documents must be *received* by the Director of Admissions at least **SIXTY DAYS** before the beginning of the semester: (1) Application for admission (2) Health form (3) Letter of financial support (4) **OFFICIAL** or **NOTARIZED** copies of transcripts of previous secondary and college level work (sent directly from schools involved) (5) TOEFL scores (sent directly by the testing agency).

I-20 forms **CANNOT** be issued until his admission has been completely cleared and all materials mentioned above have been received and processed by the Admissions Office.

College catalogs cannot be mailed to individual applicants overseas. Copies of the catalog are available for use in most offices of the U.S. Information Service.

Because of the nature of a volume feeding operation, it is not possible to provide special diets for dietary or religious purposes in the residence halls.

EACH STUDENT MUST HAVE ADEQUATE HOSPITALIZATION INSURANCE COVERAGE UPON ENROLLING OR MUST SUBSCRIBE TO THE AVAILABLE INSURANCE PROGRAM DURING REGISTRATION.

There are three ways to qualify:

1. High School Graduation.
2. Individual Approval. (G.E.D.)
3. Transfer from Other Colleges.

1. HIGH SCHOOL GRADUATION

A graduate from an accredited high school with sixteen acceptable units as outlined below will be considered for admission to The University of Texas at El Paso. Applicants must also submit Scholastic Aptitude Test (SAT) scores. The minimum requirement on the SAT is a combined total of 700 if the student was in the upper half of his graduating class, or a combined total of 800 if the student was in the lower half of his graduating class.

A Texas resident who fails to qualify for clear admission to the University because of low SAT scores still has an opportunity to enter the University as a provisional student. Provisional admission entitles the student to one spring semester or one summer session (both terms) of trial, at the end of which provisional status must be removed or the student will be ineligible for further admission.

To remove provisional status, the student must earn not less than 12 semester credit hours in the spring semester or in the summer session (both terms) with an average grade of "C" in all courses taken. No provisional student shall be initially admitted in the second summer term.

Provisional students must take courses from the following four areas: English, Science, Mathematics, and Language.

Provisional admission is restricted to residents of Texas. All provisional students must register as General Studies majors in the School of Liberal Arts.

**Schools of Business, Education
Liberal Arts, Science, and Nursing**

a. English	3
b. Mathematics	2
c. Natural Science	2
d. Social Studies	2
e. Foreign Language or additional Natural Science or Social Studies	2
f. Electives	5
Total	16

School of Engineering

a. English	3
b. Algebra	2
Geometry	1
Trigonometry	$\frac{1}{2}$
c. Natural Science	2
d. Social Studies	2
e. Foreign Language or additional Natural Science or Social Studies	2
f. Electives	$3\frac{1}{2}$
Total	16

CONDITIONAL ADMISSION

A student may not enter the School of Engineering with a condition in any subject or group.

Special consideration will be given an applicant in the Schools of Business, Education, Liberal Arts, Science, and Nursing who has a strong high school record.

High school credit conditions will be removed without penalty if the student makes an average grade of "C" in his first thirty semester hours of work completed in the University. Otherwise, conditions must be removed by using college credit, on the basis of two semester hours college credit for one-half unit high school deficiency, and three semester hours for one unit deficiency.

2. INDIVIDUAL APPROVAL METHOD (G.E.D.)

An applicant, twenty-one years of age or older, who does not have a high school diploma, may, at the discretion of the Director of Admissions and with concurrence of the appropriate academic Dean,

be admitted on Conditional status on furnishing an average standard score of 45 or above on the five sections of the General Educational Development Test.

To remove Conditional status the stu-

dent must earn a "C" average in the first fifteen semester hours attempted. Under exceptional circumstances an applicant nineteen years of age or older may be

admitted, with the approval of the Director of Admissions and concurrence of the appropriate academic Dean, if he meets the above requirements.

3. TRANSFER FROM OTHER COLLEGES OR UNIVERSITIES

Eligibility – Qualified applicants with honorable dismissal from other fully accredited colleges and universities will be admitted to The University of Texas at El Paso. A student ineligible to return to the institution last attended will not be admitted to the University. Others who have been placed on probation, or have a record of low grades may be refused admission, or admitted on probation or any other condition that seems suitable. All transfer students with less than thirty semester hours must present scores from the College Entrance Examination Board Scholastic Aptitude Test.

A transfer student who is accepted for admission to this institution but who does not have a minimum cumulative grade point average of "C" in work attempted in institutions other than The University of Texas at El Paso will be admitted on academic scholastic probation.

A student on academic probation at another institution who has not earned at least nine semester hours of college credit at that institution must let a full semester intervene before being admitted to The University of Texas at El Paso.

Transcript – Each applicant, including the student who seeks re-admission to The University of Texas at El Paso, is responsible for the direct transfer of official transcripts of his entire college record. Transient students may provide a letter of Good Standing in lieu of an official transcript during the summer session only.

Time and trouble will be saved by having your official transcripts sent directly to the Director of Admissions of The Uni-

versity of Texas at El Paso as soon as possible. Your admission cannot be cleared until your transcripts are received. Transcripts become the property of The University of Texas at El Paso and may not be returned.

An applicant who has attended another college or university is not at liberty to disregard his collegiate record and apply for admission on the basis of his high school record, but must submit all previous college records. This rule applies even if the student attended another institution for only a brief period; it also applies without regard to whether or not the student wishes credit here for college work done elsewhere.

Transfer of credit – In general, transferred credits of an admissible transfer student will be evaluated on the same basis as if the work had been earned at The University of Texas at El Paso, provided that the transferred work is included in the core curriculum of the degree sought.

Subject to the core curriculum requirement, Junior College credit (freshman and sophomore levels) will be accepted up to a maximum of sixty-six semester hours.

Extension and Correspondence

Not more than thirty semester hours of credit secured by extension and/or correspondence may be offered for a degree. Of that thirty semester hours not more than eighteen may be offered by correspondence.

4. SUBMISSION OF ADMISSION MATERIALS

All students, including former students who have been out of school two or more long semesters, must submit an application for admission or re-admission, a com-

pleted health form, official transcripts, and official S.A.T. or G.E.D. scores, if applicable. This must be done before the deadline set by the admissions office.

HOW TO PLAN YOUR CURRICULUM

If you are a beginning student, you may be undecided about a career or final goal in the University. There are certain subjects, however, generally required of ALL students — thus, you can begin by acquiring credits usable in all majors (in case you have difficulty in choosing a major and minor, or later wish to change your program).

To assist in planning your schedule, requirements for the Bachelor of Arts and the Bachelor of Science degrees are outlined on the next two pages. Requirements for Engineering degrees are listed on pages 46-51. Heads of the separate departments will give advice and explain special requirements for specific majors.

DEGREES OFFERED AT THE UNIVERSITY OF TEXAS AT EL PASO

School of Business

BACHELOR OF BUSINESS ADMINISTRATION

School of Education

BACHELOR OF SCIENCE IN EDUCATION

School of Engineering

BACHELOR OF SCIENCE IN CIVIL ENGINEERING
BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING
BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING
BACHELOR OF SCIENCE IN METALLURGICAL ENGINEERING

School of Liberal Arts

BACHELOR OF ARTS
BACHELOR OF MUSIC

School of Sciences

BACHELOR OF SCIENCE (IN SCIENCES)

School of Nursing (System-wide)

BACHELOR OF SCIENCE IN NURSING

Graduate School

MASTER OF ARTS
MASTER OF SCIENCE
MASTER OF EDUCATION

General Requirements for Undergraduate Degrees

Degree Plan — Students in the School of Business, the School of Education, the School of Liberal Arts, the School of Science, and the School of Nursing should secure from their appropriate Dean by the beginning of their third year a plan for the completion of requirement for the degree. No honorary degree will be conferred.

Catalog Requirements — A student may obtain a degree according to the course requirements of the catalog in force at the time of his admission to the University, or of a later catalog, subject to the restriction that all requirements must be completed within six years of the date of the catalog chosen and that a student is eligible to choose a catalog only from one of those years during which he enrolled and earned credit at this University. Requirements for teacher certification are subject to change on shorter notice, if necessary, to comply with standards adopted by The State Board of Education. A minimum of six advanced hours in the major field must have been completed not more than six years previous to the date of graduation. No more than six one-hour courses may be counted toward completion of the minimum total hours required for any undergraduate degree, except with specific approval by the appropriate academic dean.

Students entering The University of Texas at El Paso for the first time during a summer session will be subject to the requirements of the catalog for the next long session.

Graduation — Degrees will be conferred at the end of each semester and the summer session. Formal commencement exercises will be held at the end of the spring semester only. No candidate for a degree in the spring semester may be absent from commencement exercises, except with prior approval of the academic dean.

The Office of the Academic Dean will distribute diplomas to students who graduate. A student desiring to participate in the formal commencement at the end of the spring semester may do so if he notifies his dean two calendar months before the date of the formal commencement. A diploma will be dated and granted only as of the graduation date requested and indicated by the candidate on the official application. It is the responsibility of the graduate to obtain his diploma from the Office of the Academic Dean.

Application for Diploma — A student who intends to graduate at the end of one of the semesters of the regular session, or

the summer session, must file an application for a diploma with the student's Dean *not later* than the date here indicated for the appropriate semester or session: for the fall semester, October 30; for the spring semester, March 30; and for the summer session, July 20. An applicant for the bachelor's degree must be in good academic standing at the end of the semester or summer session in which he is a candidate for graduation.

Personal Information Forms — Each student must file a personal information form with the Placement Office by mid-semester of the semester in which he expects to graduate.

Residence — Work counting toward the degree must be completed in the University as follows: (1) a total of at least thirty semester hours, (2) twenty-four of the last thirty semester hours, and (3) six semester hours of advanced courses in the major subject.

Advanced Courses — These are junior-senior or upper division courses and are designated by 3 or 4 as the second digit of the course number. The student should refer to departmental and school requirements for specific conditions, if any, imposed on registration in upper division courses.

Advanced Placement — College credit and advanced placement are given for college level work completed in secondary schools on the basis of examination. Students who wish to take advantage of this opportunity should consult specific requirements as listed under departmental program descriptions. Such examinations may not be taken to satisfy any part of the last 30 semester credit hours for which credit is received at the University.

Political Science and History Required — Six semester hours of Political Science 3110, 3111 and six semester hours of History 3101, 3102 are required by Texas State law for completion of any Degree.

Minimum Grade Point Average —

A minimum grade point average of 2.0 is required for all course work in the required curriculum leading to the student's degree. In calculating the last grade the student receives in a given course shall be the grade used for the computation. When a course is repeated its grade is counted only the last time and a repeated grade should be indicated by a subscript "rpt." In calculating the students overall grade point

GENERAL REQUIREMENTS

average, all college work, whether transferred or taken at this University, must be included. A minimum grade point average of 2.0 on all required work attempted at The University of Texas at El Paso is required; transferred work may not be used to raise the grade average of work done at the University. A minimum grade point average of 2.0 is required in the major.

Major Examinations — At the discretion of the department concerned a major examination may be required in the major subject under the following conditions: (a) four hours written, or three hours written and one hour oral; (b) the head of the department fixes the time and place, and supervises the examination; (c) in case of failure the student may take another examination on a date determined by the head of the department.

Second Degree — No second bachelor's degree will be conferred until the candidate has completed at least twenty-four semester hours at The University of Texas at El Paso in addition to those counted toward the bachelor's degree requiring the higher number of semester hours of credit.

These additional hours must include at least six advanced hours in the major subject of the second degree, and at least six hours must have been earned after completion of requirements for the first bachelor's degree. Two bachelor's degrees may not be awarded to any candidate at the same commencement. Students working toward a second bachelor's degree will register as undergraduate students.

It is not possible for a student holding a B.A. degree from The University of Texas at El Paso to receive a second B.A. degree.

Military Service Associated Credit— All such transfer credit is subject to evaluation by the Director of Admissions. Credit may be given for the College Level Examination Program (CLEP) developed by the Education Testing Service and administered by the United States Armed Forces Institute. Credit may also be given for college-level USAFI correspondence courses. In general, no credit is given for a military service course unless it was completed as a part of a college program and credit was given for it by an accredited college. Most credit granted may be used to absolve elective requirements only.

Academic Honors at Graduation

Honors will be awarded at graduation in the following categories for first degree only:

1. **Highest Honors** — Highest Honors will be awarded to students who attain a minimum grade average of 3.90.
No transfer student shall be eligible for Highest Honors.
No student with an "F" on his record shall be eligible for Highest Honors.
2. **High Honors** — High Honors will be awarded to students who attain a minimum grade average of 3.80, but who do not qualify for Highest Honors.
A transfer student must have had 75 percent of his work at The University of Texas at El Paso to be eligible for High Honors.
3. **Honors** — Honors will be awarded to students who attain a minimum grade average of 3.50, but who do not qualify for High or Highest Honors.
A transfer student must have had 50 percent of his work at The University of Texas at El Paso to be eligible for Honors.

No student shall be eligible for any category of Honors if he has disciplinary action on his record in the Registrar's Office.

In computing the minimum grade average, grades earned in work transferred from other institutions will be included; however, transferred work may not be used to raise the grade average above that earned at The University of Texas at El Paso.



SCHOOL of ENGINEERING



ACCREDITATION

All curricula offered in the School of Engineering are accredited by the Engineers' Council for Professional Development (E.C.P.D.).

UNDERGRADUATE STUDY IN ENGINEERING

Bachelor of Science degrees are offered in Civil, Electrical, Mechanical, and Metallurgical Engineering (degree plans are shown on the following pages). Sufficient courses are offered at U.T. El Paso for a student to complete at least the sophomore year for all other engineering degrees.

MATHEMATICS PREPARATION

Mathematics 4110 is not counted for credit toward any engineering degree. Students needing this course are urged to complete it in a Summer Term before entering the regular freshman program.

HONORS PROGRAM

Students who complete a minimum of sixty semester credit hours of their respective engineering degree plans, with an overall grade point average of 3.00, are eligible to enter the engineering honors program. This program is tailored to the special needs or interests of each student; the selection and arrangement of courses are planned by the student in consultation with his department chairman.

GRADUATE STUDY IN ENGINEERING

A Master of Science degree in Engineering is offered by the Graduate School. For details, consult the Graduate Bulletin.

TRANSFERRING STUDENTS

A student may transfer from another university whose Engineering program is accredited by ECPD an amount of course work up to 60 credits in which grades equivalent to "C" or better have been obtained. This is the maximum amount of credit which can be applied toward a degree in Engineering at The University of Texas at El Paso except under exceptional circumstances. All credit must be evaluated by the Department he wishes to enroll in. Credit will be given for x3xx and x4xx courses only on the basis of a competency examination (written or oral, administered by the department offering the course). A department may require a transfer student to take certain courses which they feel he must have in order that they can attest to the quality of his degree. The acceptance of credit from colleges not accredited by ECPD may be more restrictive than the above regulations.

Bachelor of Science in Civil Engineering

1973-74

ARRANGEMENT OF COURSES

	Sem. Hrs.			
Freshman Year—1st Semester		Freshman Year—2nd Semester		
C.E. 1103 Scientific and Engineering Analysis	1	C.E. 1104 Introduction to Environmental Pollution	1	
Ch. 3105 General Chemistry	3	E. 3102 Freshman English	3	
E. 3101 Freshman English	3	C.E. 2202 Engineering Problem Analysis	2	
M.E. 3103 Graphical Fundamentals in Engineering Design	3	Ma. 3212 Analytical Geometry and Calculus	3	
Ma. 4111 Analytical Geometry and Calculus	4	Hi. 3101 History of U.S. to 1865	3	
Ph. 1120 Physics Lab I	1	Science Elective	3	
	<u>15</u>		<u>15</u>	

Sophomore Year—1st Semester		Sophomore Year—2nd Semester	
C.E. 3215 Engineering Mechanics I	3	C.E. 3234 Mechanics of Materials I	3
Hi. 3102 History of U.S. since 1865	3	M.E. 3275 Thermodynamics I	3
Ma. 3217 Analytical Geometry and Calculus	3	Ma. 3326 Differential Equations	3
Ph. 3222 Electricity and Magnetism	3	P.S. 3110 American Government	3
Ge. 3321 Geology for Engineers	3	C.E. 3238 Engineering Mechanics II	3
	<u>15</u>		<u>15</u>

*(Above are all lower division school courses.)***Summer (Six Weeks)**

C.E. 3213 Engineering Measurements 3 Sem. Hrs.

Junior Year—1st Semester		Junior Year—2nd Semester	
C.E. 3343 Structural Analysis I	3	C.E. 3226 Engineering Economy	3
M.E. 4354 Fluid Mechanics	4	Met. 3203 Materials Science	3
P.S. 3111 American Government	3	C.E. 3448 Soil Mechanics	3
Mathematics Elective	3	C.E. 1236 Materials Laboratory	1
Elective*	3	Science Elective	4
	<u>16</u>	Elective*	3
			<u>17</u>

Senior Year—1st Semester		Senior Year—2nd Semester	
C.E. 3435 Structural Design I	3	C.E. 4456 Hydraulics	4
C.E. 3441 Water Treatment and Analysis	3	C.E. 3442 Waste Treatment and Analysis	3
E.E. 4277 Basic Electrical Engineering	4	C.E. 1453 Water and Waste Laboratory	1
Electives*	8	C.E. 3461 Structural Design II	3
	<u>18</u>	Electives*	6
			<u>17</u>

Total Semester Credit Hours 131

*At least six hours of electives must be selected from the Humanities and Social Sciences; 6-9 hours from C.E. upper level courses and the remainder technical electives as approved by advisor.

Bachelor of Science in Electrical Engineering
ARRANGEMENT OF COURSES

	<i>Sem.</i> <i>Hrs.</i>		<i>Sem.</i> <i>Hrs.</i>
Freshman Year—1st Semester		Freshman Year—2nd Semester	
Ch. 3105 General Chemistry	3	Ch. 3106 General Chemistry	3
E. 3101 Freshman English	3	E. 3102 Freshman English	3
Ma. 4111 Analytical Geometry and Calculus	4	Hi. 3101 History of U.S. to 1865	3
E.E. 3105 Freshman Engineering Seminar	3	P.S. 3110 American Government and Politics	3
Approved Elective*	3	Ma. 3212 Analytical Geometry and Calculus	3
	<hr/> 16		<hr/> 15
Sophomore Year—1st Semester		Sophomore Year—2nd Semester	
C.E. 3215 Engineering Mechanics I	3	E.E. 3251 Networks I	3
Ma. 3217 Analytical Geometry and Calculus	3	E.E. 1209 Basic Elect. Eng. Lab.	1
Ph. 3222 Electricity and Magnetism	3	Ma. 3326 Differential Equations	3
E.E. 3220 Introduction to Engineering Computation	3	P.S. 3111 American Government	3
Hi. 3102 History of the U.S. Since 1865	3	C.E. 3238 Engineering Mechanics II	3
	<hr/> 15	Ph. 3221 Heat, Wave Motion, and Optics	3
			<hr/> 16
Junior Year—1st Semester		Junior Year—2nd Semester	
E.E. 2310 Elect. Eng. Lab. I	2	E.E. 2311 Elect. Eng. Lab II	2
E.E. 3339 Electronics I	3	E.E. 3321 Electromagnetic Field Theory	3
E.E. 3352 Networks II	3	E.E. 3340 Electronics II	3
Approved Elective*	3	Met. 3309 Phys. of Materials	3
Met. 3308 Classical Stat. Thermodynamics	3	Approved Elective*	6
Ph. 3325 Intro. to Modern Physics	3		<hr/> 17
	<hr/> 17		
Senior Year Two Semesters			
E.E. 2412 Senior Project Lab		2	
E.E. 3441 Communication Systems		3	
E.E. 3447 Electromagnetic Energy Transmission & Radiation		3	
E.E. 3464 Systems & Controls		3	
E.E. 3485 Energy Conversion		3	
C.E. 3326 Engineering Economy		3	
Approved Electives*		15	
		<hr/> 32	
Total Semester Credit Hours 128			

*Twenty-seven hours of approved electives are required. Nine hours of electives must be in the Humanities and Social Sciences. Six hours of electives must be in Mathematics. Twelve hours of electives must be in Engineering and the Biological or Physical Sciences.

A cumulative grade point average of 2.0 in the mathematics, science and engineering courses required in the freshman and sophomore years is a prerequisite to the electrical engineering courses of the first semester of the junior year.

Bachelor of Science in Mechanical Engineering

ARRANGEMENT OF COURSES

UNIFORM CURRICULUM FOR ALL OPTIONS THROUGH THE SOPHOMORE YEAR

Freshman Year—1st Semester	<i>Sem. Hrs.</i>	Freshman Year—2nd Semester	<i>Sem. Hrs.</i>
Ch. 3105 General Chemistry	3	Phy. 3120 Mechanics	3
E. 3101 Freshman English	3	Phy. 1120 Physics Lab	1
Hi. 3101 History of U. S. to 1865	3	E. 3102 Freshman English	3
M.E. 3103 Graphic Fundamentals of Engineering Design	3	Hi. 3102 Hist. of U. S. since 1865	3
Ma. 4111 Analytical Geometry and Calculus	4	M.E. 3104 Freshman Design	3
	<hr/> 16	Ma. 3212 Analytical Geometry and Calculus	3
			<hr/> 16

Sophomore Year—1st Semester		Sophomore Year—2nd Semester	
C.E. 3215 Engineering Mechanics I	3	C.E. 3238 Engineering Mechanics II	3
M.E. 3236 Manufacturing Processes	3	Met. 3203 Materials Science	3
Ma. 3217 Analytical Geometry and Calculus	3	M.E. 3205 Basic Measurements and Instrumentation	3
*Science Elective	4	M.E. 3275 Thermodynamics I	3
Humanities Elective	3	Ma. 3326 Differential Equations	3
	<hr/> 16		<hr/> 15

*Science Elective: Geo. 4101, Bio. 3105 & Bio. 1107, Chem. 3106 & Chem. 2106

INDUSTRIAL ENGINEERING OPTION

Junior Year—1st Semester		Junior Year—2nd Semester	
Phys. 3222 Elect. & Magnetism	3	C.E. 3234 Mechanics of Materials I	3
Phys. 1121 Physics Lab	1	E.E. 4277 Basic Electrical Engineering	4
*Math Elective	3	M.E. 3363 Kinematics of Mechanisms	3
M.E. 4354 Fluid Mechanics	4	M.E. 4351 Heat Transfer	4
M.E. 3376 Thermodynamics II	3	M.E. 3378 Parametric Methods	3
M.E. 3377 Work Measurement	3		
	<hr/> 17		<hr/> 17

Senior Year—1st Semester		Senior Year—2nd Semester	
Phys. Elective (same for all options)	3	M.E. 3484 Industrial Layout	3
C.E. 3326 Engineering Economy	3	M.E. 3485 Statistical Quality Control	3
M.E. 3464 Senior Analysis	3	P.S. 3111 American Government	3
P.S. 3110 American Government	3	Approved Electives	6
M.E. 3486 Human Factors in Engineering	3	Humanity	3
M.E. 3489 Optimization	3		
	<hr/> 18		<hr/> 16

*Math Elective: Math 3335, 3436, 3330

Total Semester Credit Hours 133

Design and Fluids Thermal Option

	Sem. Hrs.		Sem. Hrs.
Junior Year—1st Semester		Junior Year—2nd Semester	
Phys. 3222 Elect. & Magnetism . . .	3	*Math Elective	3
Phys. 1121 Physics Laboratory . . .	1	E.E. 4277 Basic Electrical Engineering . .	4
C.E. 3234 Mechanics of Materials I . .	3	C.E. 3326 Engineering Economy . . .	3
M.E. 4354 Fluid Mechanics	4	M.E. 4351 Heat Transfer	4
M.E. 3363 Kinematics of Mechanisms .	3	P.S. 3110 American Government . . .	3
M.E. 3376 Thermodynamics II . . .	3		---
	17		17
Senior Year—1st Semester		Senior Year—2nd Semester	
Phys. Elective (Same for all Options) .	3	Options	13
Options	7	Humanities	3
M.E. 3464 Senior Analysis	3		---
P.S. 3111 American Government . . .	3		16
	16		16

*Math Elective — either Ma. 3335 or Ma. 3436

Total Semester Credit Hours 129

DESIGN OPTION

Phys. 3323 Physical Optics,	
3351 Analytical Mechanics	
3325 Intro. to Modern Physics, or	
3448 Fundamentals of Acoustics . . .	3
M.E. 3367 Dynamics of Machinery . . .	3
M.E. 3441 Engineering Analysis . . .	3
M.E. 4465 Dynamic Response	4
M.E. 4466 Senior Design	4
Approved Electives	6

	23

FLUIDS THERMAL OPTION

Phys. 3323 Physical Optics,	
3325 Modern Physics,	
3351 Analytical Mechanics, or	
3448 Fundamentals of	
Acoustics	3
M.E. 3455 Gas Dynamics	3
M.E. 3441 Engineering Analysis . . .	3
M.E. 4465 Dynamic Response	4
M.E. 4466 Senior Design	4
Approved Electives	6

	23

Abbreviations Used in Degree Plans

Acct.	Accounting	Hi.	History
C.E.	Civil Engineering	M.E.	Mechanical Engineering
Ch.	Chemistry	Ma.	Mathematics
E.	English	Met.	Metallurgical Engineering
E.E.	Electrical Engineering	P.S.	Political Science
Ge.	Geology	Ph.	Physics

Bachelor of Science in Metallurgical Engineering

ARRANGEMENT OF COURSES

Freshman Year—1st Semester	Sem. Hrs.	Freshman Year—2nd Semester	Sem. Hrs.
Ch. 3105 General Chemistry	3	Ch. 3106 General Chemistry	3
E. 3101 Freshman English	3	Ch. 2106 Chemistry Lab	2
M.E. 3103 Graphical Fundamentals	3	E. 3102 Freshman English	3
Ma. 4111 Mathematics	4	Ma. 3212 Mathematics	3
Met. 3105 Engineering Analysis	3	Met. 2107 Polymer Engineering	2
	<u>16</u>	Met. 3106 Metallurgical Principles	3
			<u>16</u>
Sophomore Year—1st Semester		Sophomore Year—2nd Semester	
C.E. 3215 Mechanics I	3	C.E. 3238 Mechanics II	3
Ch. 3351 Physical Chemistry	3	Ma. 3326 Differential Equations	3
Ch. 1351 Lab for Chemistry 3351	1	Met. 3205 Rate Phenomena in Metallurgical Engr.	3
Ma. 3217 Calculus	3	Met. 3206 Mass & Energy Transfer	3
Met. 3203 Materials Science	3	Ph. 3222 Electricity & Magnetism	3
Met. 3204 Experimental Methods in Metallurgical Engr.	3		<u>15</u>
	<u>16</u>		
Junior Year—1st Semester		Junior Year—2nd Semester	
E.E. 4278 Electronics for Engrs. and Scientists	4	Hi. 3102 Hist. of U.S. from 1865	3
Hi. 3101 Hist. of U.S. to 1865	3	M.E. 3201 Engineering Communications 3	3
Met. 3304 Process Metallurgy I	3	Met. 3305 Process Metallurgy II	3
Met. 3306 Physical Metallurgy I	3	Met. 3307 Physical Metallurgy II	3
Approved Elective*	3	Approved Elective*	3
	<u>16</u>		<u>15</u>
Senior Year		Two Semesters	
P.S. 3110-11 American Gov't & Politics	6	Approved Elective*	3
Approved Elective*	3	Met. 3406 Senior Project	3
Met. 3406 Senior Project	3	Senior Metallurgical Engr. Electives	23
			<u>35</u>
Total Semester Credit Hours 129			

Two principle options are available, i.e., Chemical Process Metallurgy and Physical Metallurgy.

*At least nine hours of electives must be selected from the Humanities and Social Sciences.

Bachelor of Arts Degree

The School of Liberal Arts has revised the requirements for the B.A. degree, in the belief that the arbitrary requirement of a list of specified courses may well be obsolete. The new plan, adopted by the faculty of the School after long study, is designed to offer the student a large measure of freedom in the choice of courses and at the same time to maintain a unifying pattern for the education of all undergraduate Liberal Arts students.

1. Complete a minimum of 123 semester hours, including at least 36 hours at the advanced level (300-400). Twenty-four of the last 30 hours required for the degree must be taken in residence.
2. Complete 30 - 38 semester hours of *Required Courses*, as follows:

Min. Sem. Hrs.

- | | |
|------|--|
| 6 | English Composition 3111-3112; Linguistics 4101-4102. |
| 6 | Any combination from English 3211, 3212, 3213, 3214, 3215, 3216; History 3201, 3202; French 3301, 3303; German 3301, 3303; Spanish 3301, 3302, 3303; Russian 3321, 3323. |
| 6 | History 3101-3102. |
| 6 | Political Science 3110-3111. |
| 6-14 | Complete sophomore year of a modern foreign language offered by the Department of Modern Languages. See paragraph 5, next page. |

Credit counted under *Required Courses* may not also be used to satisfy *Elective Block* requirements.

Unless a student completes English 3110 by advanced placement, he must take the course each time he enrolls until he passes it; thereafter, unless a student completes English 3111 by advanced placement, he must take the course each time he enrolls until he passes it. Unless a student completes English 3112 by advanced placement, he must thereafter take the course each time he enrolls until he passes it.

3. Complete a major prescribed by an academic department in the School of Liberal Arts or in the School of Science of at least 24 semester hours, of which at least 12 semester hours must be at the advanced (300-400) level. A major may also be completed in Business Administration (Accounting and Business options), Economics or Finance. Variations from these general requirements are listed under each department's Course Descriptions (following page 92 of this catalog). Nine of the advanced hours must be completed in residence within three years prior to the date of graduation. One-hour courses may not be counted toward the minimum 24 hours required in the major, with the exception that the Dean of the School of Liberal Arts may approve certain one-hour courses taught in the School of Science. No course taken on a Pass-Fail basis may be counted for the major, even though the student changes majors after having taken the course. A completed degree plan must include a minimum grade average of C (2.0) in the major. If a course is repeated, the last grade earned is used in computing this average.
4. Complete the following *Blocks of Electives*:

Min. Sem. Hrs.

- | | | |
|----|---------|----------------------------------|
| 6 | Block A | Fine Arts |
| 12 | Block B | Social Sciences |
| 15 | Block C | Humanities |
| 12 | Block D | Natural Sciences and Mathematics |

If the major is listed in Blocks B, C, or D, six hours of the course work required for the major may be counted toward satisfaction of that Block. This restriction applies

to only one major if the student completes a double major. If the major is one of the fine arts, however, no more than three hours in the major may be used to satisfy Block A. No student may present courses from only one subject matter area to fulfill all requirements of Block B, C, or D. A course taken to meet the requirements of one Block cannot also be counted to satisfy requirements in another Block. With certain exceptions, one-hour courses cannot be used to satisfy Elective Blocks.

Blocks of Electives are defined as follows:

Block A – Fine Arts: Art, Drama, Music

Block B – Social Sciences: Anthropology, Economics, Political Science, Psychology, Sociology

Block C – Humanities: English, Foreign Languages, History, Philosophy, Speech

Block D – Natural Sciences and Mathematics: Biology, Chemistry, Geology, Mathematics, Physics

Geography courses which are chiefly social, cultural, or economic will normally be counted in Block B. Physical geography and geomorphology, taught in the Department of Geological Sciences, will ordinarily be counted in Block D. Substitutions recommended in Block B by the student's major advisor, primarily from Linguistics, Mass Communication, and Speech Pathology, may be approved by the Dean of Liberal Arts.

The requirements of Block D may be reduced, on the basis of science and mathematics courses the student has completed in high school, by the Dean of Liberal Arts. If the requirement is thereby reduced, the student must satisfy the remainder of Block D with courses specified by the Dean. At least two additional courses will be prescribed. Students who have satisfactory grades in two and one half units or more of mathematics (*algebra, calculus, geometry, trigonometry*) in high school may be excused by the Dean from taking additional mathematics courses, except as the major department may require.

At the discretion of the Dean of Liberal Arts, placement tests may be required for waiver of any part of the Science-Mathematics requirements.

In general, the Dean may excuse a student from one semester of the science requirement if he has completed a year of the same science in high school with satisfactory grades. Ordinarily, he should not repeat this science, but should instead choose other sciences to complete the Block D requirement. For example, a student who has had a year of high school chemistry should meet the remainder of the science requirement by selecting courses from biology, geology, and physics.

The use of high school credits to satisfy Block D will not reduce the minimum total of 123 semester hours required for the degree. This rule does not prohibit use of credit earned by advanced standing or proficiency examinations acceptable to the Dean toward satisfaction of any course requirement or of the minimum total hours.

5. Complete the sophomore year (language courses numbered 3201-02) of a foreign language offered in the Department of Modern Languages. With the Dean's approval, credit earned by examination for advanced standing may be used to meet this requirement. No more than six hours of this general language requirement may be counted under Block C. A student who has for at least two years attended a high school where instruction is not conducted in English, and who has graduated from that school or another in the same foreign country, may petition the Dean of Liberal Arts for exemption from foreign language study.
6. Complete additional courses as prescribed by the department of the major.

7. Complete *Free Electives* as needed to bring the total semester hours of credit to at least 123. Any undergraduate course offered by an academic department in any School of the University may be counted as a Free Elective, provided that the credit cannot also be used in meeting any other requirement. Courses taken in the department of the major which are not needed to meet the requirements of the major may be counted as Free Electives. Free Electives of advanced (300-400) level, with the exception of most one-hour courses, are applied toward satisfaction of the requirement of 36 hours of advanced hours.
8. Not more than six hours of credit in one-hour courses, excluding certain laboratory courses in the School of Science, can be counted toward a degree.
9. Graduate (500 level) courses cannot be used to meet any requirement for the Bachelor of Arts degree; such courses must be reserved for graduate credit and may only be taken by undergraduates with the prior approval of the Dean of the Graduate School.

TEACHER CERTIFICATION WITH B.A. DEGREE

The Bachelor of Arts *All Levels Teaching Program* in Art is outlined on page 67; the Bachelor of Music *All Levels Teaching Program in Music* is outlined on pages 69 and 70. Students who plan to teach other subjects in public high schools and who wish to earn a Bachelor of Arts degree should confer with the Dean of the School of Liberal Arts. Completion of the baccalaureate degree satisfies Academic Foundations requirements for teacher certification. If the major subject is one of the Teaching Fields listed under Plan I on pages 74 and 75, the B.A. major provides one Field. Plan I also requires a second Teaching Field of 24 semester hours, including 12 hours of 300-400 level courses. This credit may be counted toward satisfaction of the appropriate Elective Blocks or as Free Electives. For some students a Composite Teaching Field in Science, Social Studies or English, outlined under Plan II on page 76, is a more appropriate choice. Teacher certification under either plan also requires completion of 18 semester hours of 300-400 level courses in Education, including Education 3498-3499, Professional Laboratory Experiences. (Application must be filed with the Director of Field Experiences during the spring semester preceding the year when the courses will be taken.) Education courses required for teacher certification may be counted as Electives and toward satisfaction of the general requirement of 36 advanced hours.

PRE - LAW

Students who plan to satisfy requirements for admission to a school of law, or who have questions concerning any other matter relating to pre-legal studies, are urged to consult either of the Pre-Law Advisors, Dr. L. Phil Blanchard or Dr. Joseph B. Graves.

ALLIED HEALTH PROGRAMS

Students who plan to satisfy requirements for admission to a school of medicine, a school of dentistry, or a school of veterinary medicine, or a school of medical technology are requested to consult with the Health Professions Advisor, Dr. James B. Reeves.

BACHELOR OF ARTS

INTER-AMERICAN STUDIES

CHESTER C. CHRISTIAN, JR., *Program Director*

The Inter-American Studies program is an inter-disciplinary major with a Latin American orientation designed to prepare students for a career in Latin America in government, business, or education, or for advanced study in a Latin American field at the graduate level. The program is administered by the Executive Committee of the Inter-American Institute, which coordinates its activities whenever possible with those of the Inter-American Studies program, thereby providing lecturers, seminars, and other Latin American resource opportunities. Fluency in Spanish, rather than a given number of credit hours, is the desired language objective; and an oral comprehensive examination conducted in Spanish on Latin American politics, resources, geography, and literature, as well as Spanish composition, must be satisfactorily completed prior to graduation.

In addition to the general requirements for the B.A. degree, the following specific requirements are prescribed, plus one of the following four options: Economics-Business, Government, History, and Spanish. Completion of one of these options fulfills the major and minor requirements for the degree.

Specific requirements are: Economics 3204, English or Linguistics 3308, Political Science 3333, History 3205, 3206 (or 3347), Philosophy 3212 (or Spanish 3467), Spanish 3322, 3357.

ECONOMICS - BUSINESS OPTION

ACCOUNTING	3211, 3212, or Accounting 3309 and General Business 3102.
BUSINESS	6 hours of Business electives of which 3 hours must be advanced.
ECONOMICS	3365, 3366, 3367 or 3368.
SOCIAL SCIENCES	Three of the following: History 3346, 3348, 3349; Political Science 3347, 3433, 3444; Sociology 3336, 3360; Geography 3312.
ELECTIVES	9 hours.

POLITICAL SCIENCE OPTION

POLITICAL SCIENCE	3347, 3433, 3444 plus 9 advanced hours in Political Science.
SOCIAL SCIENCES	Three of the following: History 3346, 3348, 3349; Economics 3366, 3367, 3368; Geography 3312; Sociology 3336, 3360.
ELECTIVES	12 hours.

HISTORY OPTION

HISTORY	3202, 3346, 3348, 3349, plus 6 advanced hours in History.
SOCIAL SCIENCES	Three of the following: Economics 3366, 3367, 3368; Political Science 3347, 3433, 3444; Sociology 3336, 3360; Geography 3312.
ELECTIVES	9 hours.

SPANISH OPTION

SPANISH	12 hours of the following: 3302, 3424, 3425, 3460, 3462, 3463, 3464, 3465.
HISTORY	Two of the following: 3346, 3347, 3348, 3349.
SOCIAL SCIENCES	Three of the following: Economics 3366, 3367, 3368; Political Science 3347, 3433, 3444; Sociology 3336, 3360; Geography 3312.
ELECTIVES	12 hours.

CHICANO STUDIES

CARINA G. RAMIREZ, *Director*

The University offers in a number of departments various courses classified as Chicano Studies. These courses are designed to provide interested students with knowledge about the Chicano, his origins, history, social evolution, heritage, and contributions to the changing character of American society.

The program in Chicano Studies is also designed to prepare students for careers in Chicano community programs, teaching Chicano children or for advanced study in a Chicano Studies field at the graduate level, as well as preparing students for a career in a more traditional area of learning.

All courses listed in the program are open to any student having the academic prerequisites. Credit may be counted (1) toward a departmental major in another field, where appropriate; (2) toward an interdisciplinary major, with a second major field of concentration as specified by an academic department; (3) to complete Blocks of Electives; (4) as Free Electives.

Chicano Studies is an interdisciplinary program which may be begun in the Freshman or Sophomore year. Students desiring to pursue this program should consult with the Chicano Studies Director to determine a program most suitable to their interests and future needs.

In addition to meeting the general requirements for the Bachelor of Arts degree, including a departmental specialization, the student majoring in Chicano Studies must earn 24 hours of credit in Core Courses, 6 hours of which must be sophomore-level courses and 12 hours of which must be advanced, including 6 hours of 3400-level courses. Philosophy 3109 is the prerequisite for all Chicano Studies courses of 3200 or higher level.

The Chicano Studies degree program also requires completion of a departmental major of at least 24 semester hours. Courses taken in this major, as well as those chosen for completion of Elective Blocks and Free Electives, should include as many of the Related Courses as possible. In effect, this plan combines the two majors into a comprehensive program with an extended area of expertise.

CORE COURSES

(See current schedule of classes for course offerings and prerequisites.)

ANTHROPOLOGY

3205 Chicanos and their Culture

DRAMA

3335 Chicano Theatre and Drama

EDUCATION

3250 Educational Workshop (When topic is appropriate)

3450 Education Workshop-Chicano Education (When topic is appropriate)

ENGLISH

3310 Literature of the Mexican American

3374 Chicano Folklore (when topic is appropriate)

3440 Special Studies-Chicano Fiction

HISTORY

3209 History of The Chicano

3342 The Spanish Borderlands & the Southwest (1492-1821)

PHILOSOPHY

3109 Introduction to Chicano Thought

3213 Chicanos and American Thought

POLITICAL SCIENCE

3321 Chicanos and American Politics

PSYCHOLOGY

3203 Social Psychology of the Chicano

SOCIOLOGY

3258 Chicanos in the Southwest

3259 Chicanos and American Society

SPANISH

3462 The New World in Spanish Literature

SPEECH

3345 Rhetoric of Chicano Affairs

RELATED COURSES**ART**

3310 History of Latin American Art

ECONOMICS

3366 Economics of Latin America

ENGLISH

3386 Background Readings: Mexican American Literature

HISTORY

3316 Southwest Frontier

3317 History of Texas since 1821

3342 The Spanish Borderlands

3346 The United States and Latin America

3348 Mexico in the Colonial Period, to 1821

3349 Mexico since 1821

3350 History of the Mexican Revolution, 1910-1940

PHILOSOPHY

3212 Latin American Philosophy

POLITICAL SCIENCE

3433 Latin American Political Thought

3444 The Political System of Mexico

SOCIOLOGY

3327 Minority Groups in the United States

3336 Comparative Cultures

3352 Sociology of Poverty

3360 Institutions and Cultures of Latin America

SPANISH

3302 Introduction to Spanish American Literature

3322 Latin American Culture

3424 The Literary History of Mexico

3425 The Novel of the Mexican Revolution

3460 The Regional and Historical Novel of Latin America

PROGRAM IN BLACK STUDIES

The Black Studies program is designed to provide knowledge of the Afro-American's history, culture and heritage, and of his role in politics in the Anglo-American society.

All courses listed in the program are open to any student having the academic prerequisites. Credit earned may be counted (1) toward a departmental major, where appropriate; (2) to complete Blocks of Electives; or (3) as Free Electives.

ANTHROPOLOGY 3302 Comparative Social Systems

ANTHROPOLOGY 3317 Peoples of Africa

ANTHROPOLOGY 3320 Afro-American Culture

ART 1101 Comparative Ethnic Art

BIBLE 3210 Religion in Africa

ENGLISH 3315 Literature of the Black American

ENGLISH 3375 Folklore of the Black American

HISTORY 3313 The Afro-American in U.S. History

HISTORY 3336 Islamic Civilization, to 1250

HISTORY 3337 Islamic Civilization, Since 1250

HISTORY 3339 The Near East and North Africa Since 1800

POLITICAL SCIENCE 3320 Political Socialization and Political Culture

POLITICAL SCIENCE 3435 Contemporary Political Thought

SOCIOLOGY 3327 Minority Groups in the U.S.

SOCIOLOGY 3336 Comparative Cultures

SOCIOLOGY 3352 Sociology of Poverty

SOVIET AND EAST EUROPEAN STUDIES

The Soviet and East European Studies Program is an optional plan available to Political Science or History majors and is designed to prepare students for a career in American business, education and government agencies dealing with the Soviet and East European area or for advanced study in Soviet and East European fields at the graduate level.

Specific requirements for all students in the Program are: Russian 3321, 3323; Political Science 3324, 3338; History 3331, or 3333 and 3373 or 3374; Economics 3395; Geography 3207; English 3385 or 3386. All students must also satisfy the general requirements of the Bachelor of Arts degree. Departmental requirements for Political Science majors are listed on page 198; those for History majors, page 162.

Professor Z. Anthony Kruszewski is the advisor for Soviet and East European Studies.

Bachelor of Music

Major Areas: (1) Music Education, Choral and Instrumental (see All-Levels Teacher Program). (2) Performance: Orchestra and Band Instruments, Keyboard Instruments, Voice or Ballet. (3) Theory and Composition.

All music majors must declare a major performing medium.

Placement and Proficiency Auditions in piano, voice, and major instruments are required of all music majors. A private interview and a proficiency test are required in music theory to determine the level of study. Advanced placement is possible.

Music Majors transferring from another institution must pass proficiency tests on their major and secondary instruments, piano, and conducting.

For detailed requirements and course sequence for music majors and minors, consult the Music Department Handbook with the Department Chairman.

GENERAL REQUIREMENTS FOR ALL MAJORS IN PERFORMANCE AND IN THEORY AND COMPOSITION

*Minimum
Semester
Hours*

- 12 — ENGLISH.
- 12 — MUSIC LITERATURE AND HISTORY (exception: Ballet Majors take History of Ballet 2343 and 2344 in addition.)
- 3 — SPEECH (Not required of Theory-Composition and Keyboard Instrument Majors; Ballet Majors also take Drama 3213).
- 6 — HISTORY 3101, 3102.
- 6 — POLITICAL SCIENCE 3110, 3111.
- 12 to 25 — THEORY 2111, 2112; 1111, 1112, 3113, 3114; 1211, 1212, 3213, 3214; 2315; 3411 or 3412. (Ballet Majors, 12 semester hours only, 2111 through 3114; Theory-Composition Majors, 19 additional hours; Keyboard Majors, 5 additional hours; Orchestra-Band Instrument and Voice Majors, 2 additional hours.)
- 6 — MUSIC EDUCATION 3331, and 3333 or 3435 (exception: Theory-Composition requires only 3331 or 3333; Ballet Major requires only 3435; Vocal Performance Major requires *Vocal Pedagogy 2493 in addition*).
- 8 — FOREIGN LANGUAGE 4101, 4102 (required only of Performance Majors in Voice and Ballet; Ballet Majors take French. In addition, Diction 3190 required of Vocal Performance Majors).

APPLIED MUSIC:

- A. 38 — for *Theory-Composition Majors*: 18 semester hours of major instrument; 10 semester hours of class lessons in orchestra and band instruments; Vocal Pedagogy 2493 or Voice Class 2173; minimum proficiency of Piano 2282 must be achieved; final composition project.
- B. 38 — for *Keyboard Performance Majors*: 32 semester hours of the 4191 sequence on the major instrument (4492 must be completed); 2 semester hours, or equivalent, of Piano Sight-Reading; 4 semester hours, or equivalent, of Chamber Music and Accompanying (3 of Accompanying); Voice, 4 hours; Piano Pedagogy 2494.
- C. 40 — for *Orchestra-Band Instrument Performance Majors*: 32 semester hours of the 4191 sequence on the major instrument (4492 must be completed); 4 semester hours, or equivalent, of Piano; 4 semester hours of Chamber Music.

- D. 44 – for Vocal Performance Majors: 32 semester hours of private voice, including 24 hours of the 3191 sequence (must complete 3492); 4 semester hours of Opera Workshop; 8 semester hours, or equivalent, of Piano.
- E. 37 – for Ballet Performance Majors: Ballet Technique 3141-42; 1241, 1242, 3241, 3242, 3341, 3342; 3441-42; Choreography 3444; 8 semester hours, or equivalent, of piano.

Participation for 8 semesters or each semester in residence in the ensemble of the major instrument. For exceptions, petition the Music Faculty in writing.

Qualified bandmen interested in preparing to direct orchestra must meet minimum participation requirements in orchestra, and vice-versa.

Recital participation and/or attendance is required every semester in residence, and is considered laboratory for other music courses. Performance Majors must present a full graduation recital approved by the Music Faculty.

ELECTIVES: To make a minimum total of 123 semester hours for Performance Majors, including 30 advanced hours. (Ballet Majors take 22 semester hours of electives [Art 3105, 3106 are recommended], to total 135 semester hours.)

Bachelor of Science in Medical Technology

Medical Technology is one of the important new careers in science today. Medical technologists are trained specialists working in clinical or medical laboratories where they perform scientific tests on which pathologists and doctors rely for help in the diagnosis and treatment of disease.

The work of the medical technologist is both important and challenging. It involves great responsibility and it requires thorough scientific and technical training.

DEGREE REQUIREMENTS:

The Bachelor of Science Degree program is sponsored by the Department of Biological Sciences.

The curriculum consists of a minimum of three years and one term of summer school work (111 semester hours) taken in the Schools of Liberal Arts and Science and 12 months training in a school of Medical Technology approved by the American Society of Clinical Pathologists. The specific courses and general requirements for the degree program are as follows:

Min. Sem. Hrs.

- 12 – ENGLISH 3101-02 and 3269.
- 8 – MATHEMATICS 4111-3212 or 3280-81.
- 6 – POLITICAL SCIENCE 3110-11.
- 6 – HISTORY 3101-02.
- 8 – PHYSICS 4103-04.
- 16 – BIOLOGY 3105-06, 1107-08, 4211, 1212, 3320.
- 3 – ZOOLOGY 2264, 1265.
- 16 – MICROBIOLOGY 3240, 1241, 3343, 1344, 3453, 1454, 3455, 1456.
- 26 – CHEMISTRY 3105-06, 2106, 4213, 4324-25, 3430-31.
- 10 – ELECT. VES.
- 111 – TOTAL.

An overall "C" average must be maintained.

A year (12 months) of professional training must be satisfactorily completed in an approved school of Medical Technology.

The University of Texas at El Paso participates in agreements whereby students who satisfactorily complete the prescribed course work at the university may take a year of professional training in the School of Medical Technology either at R. E. Thomason General Hospital, El Paso, Texas, or at William Beaumont General Hospital.

The above program is designed to provide the necessary scientific and professional training for a substantially high level of competence, and should thus provide the background required to achieve the professional excellence necessary for the ultimate responsibility of supervisory positions.

Bachelor of Science

(SCIENCES)

MAJOR SUBJECTS: *Biological Sciences, Chemistry, Geology,
Mathematics, Physics, Psychology.*

MINORS: *Biological Sciences, Chemistry, Engineering, Geology,
Mathematics, Physics, Psychology.*

Min. Sem. Hrs.

- 30 — MAJOR: at least 30 semester hours including 15 semester hours of advanced courses. See Departmental course descriptions (page 208 and following page 209) for specific requirements including additional semester hours and particular course requirements.
- 18 — MINOR: all departments require a minimum of 18 semester hours including 6 semester hours of advanced work. See departmental course descriptions for specific requirements including permissible minor fields.
- 6 — POLITICAL SCIENCE 3110-11.
- 6 — HISTORY 3101 and 3102.
- 12 — ENGLISH 3101-02 and 3269.
- 7 — MATHEMATICS 4111-3212.
See departmental course descriptions for specific prerequisites in Mathematics which will generally extend the mathematics requirements. Statistics sequences may replace the calculus sequence in certain programs.
- § — ELECTIVES: to make a minimum total of at least 135 semester hours, including a total of 36 semester hours in advanced courses. See Departmental Course Description for foreign language requirement, if any.

School of Business Administration

Undergraduate degree:

The School offers the Bachelor of Business Administration (BBA) degree, with major options in Accounting, Economics, Finance, Management, Marketing and Office Management.

Course of Study:

The course of study required for the BBA degree is divided into three groups of courses:

A: BUSINESS FOUNDATION REQUIREMENTS	— 60 semester hours
B: BUSINESS CORE REQUIREMENTS	— 24 semester hours
C: MAJOR OPTION REQUIREMENTS	— 39 semester hours
TOTAL	123 semester hours

The specific courses included within these requirements are listed on the following pages in the sequence in which they are to be taken.

Student's Major Designation:

1. All students entering the School will be designated as Pre-Business Majors (abbreviated — PREB) and will remain in this classification until they have completed all Business Foundation Requirements.

2. During the semester in which a PREB major is completing the Business Foundation requirements (or will complete these requirements with less than a full load in the next semester) the student must report to the Pre-Business advisor and change to one of the following major options:

ACCT — ACCOUNTING	MGMT — MANAGEMENT
BECO — ECONOMICS	MKT — MARKETING
FIN — FINANCE	OFCM — OFFICE MANAGEMENT

3. A student is eligible to enroll in Business Core and Business Option courses only after completion of Business Foundation Requirements and declaration of a major option.

Other Degree Requirements:

In addition to completing the required course of study, a student must meet all of the General Requirements for Undergraduate Degrees and earn a 2.0 grade point average in all courses attempted within the School of Business Administration.

Transfer Credit:

In general the School will limit transfer credit for business courses taken at a lower division level to such courses that are offered at that level. In all cases, however, a transfer student must complete the minimum number of upper division hours (42) required of a non-transfer student.

**BACHELOR OF BUSINESS ADMINISTRATION
SEQUENCE OF COURSES**

**A. BUSINESS FOUNDATION REQUIREMENTS
(60 Semester Hours)**

Freshman Year

1st Semester		2nd Semester	
Natural Science ¹	3	Natural Science ¹	3
English 3101	3	English 3102	3
Pol. Science 3110	3	Pol. Science 3111	3
History 3101	3	History 3102	3
Speech 3102	3	Math 3120	3
	15		15

Sophomore Year

1st Semester		2nd Semester	
ACCT 3211	3	ACCT 3212 ³	3
Math 3201	3	GENB 3203	3
ECON 3203	3	STAT 3201	3
Soph. Eng.	3	Soph. Eng.	3
Soc. Science ²	3	ECON 3204	3
	15		15

B. BUSINESS CORE — C. MAJOR OPTION REQUIREMENTS

Business Core and Major Option Requirements, as listed below, should be taken in the following sequence after consultation with a major adviser.

Junior Year

1st Semester		2nd Semester	
OFCM 3308	3	Business Core and Option Requirements (including	
BLAW 3301	3	electives)	15/18
ACCT 3311 ³	3		
Business Core and Option Requirements	6		
	15		15/18

Senior Year

1st Semester		2nd Semester	
Option requirements (including electives)	15/18	Option requirements (including electives)	12
		MGMT 3400	3
	15/18		15

¹ Natural Science elected from Biology, Chemistry, Geology or Physics
² Social Science elected from Philosophy, Psychology, Sociology or Anthropology.
³ Students planning to major in Accounting should substitute ACCT 3221 for ACCT 3212 and ACCT 3327 for ACCT 3311.

BUSINESS CORE REQUIREMENTS

(24 Semester Hours)

ACCOUNTING:	ACCT	3311	
BUSINESS LAW:	BLAW	3301	
FINANCE:	FIN	3310	and either FIN 3320 or ECON 3320
MANAGEMENT:	MGMT	3300	
MARKETING:	MKT	3300	
COMMUNICATION:	OFCM	3308	
BUSINESS POLICY:	MGMT	3400	

BUSINESS MAJOR OPTIONS *

(39 Minimum Semester Hours)

Min. Sem. Hrs.

ACCOUNTING OPTION

- 6 — ACCOUNTING 3321, 3322.
- 12 — ACCOUNTING ELECTIVES.
- 12 — NON-BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

ECONOMICS OPTION

- 12 — ADVANCED BUSINESS ELECTIVES.
- 6 — ECONOMICS 3302, 3303.
- 12 — ECONOMICS ELECTIVES
- 9 — NON-BUSINESS ELECTIVES.

FINANCE OPTION

- 12 — FINANCE.
- 6 — ADVANCED BUSINESS ELECTIVES.
- 12 — NON-BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

MANAGEMENT OPTION

- 6 — MANAGEMENT 3310 and 3311.
- 6 — ADVANCED MANAGEMENT ELECTIVES.
- 6 — ADVANCED BUSINESS ELECTIVES.
- 12 — NON-BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

MARKETING OPTION

- 9 — MARKETING 3308, 3401, 3409.
- 9 — MARKETING 3302, 3303 and 3304, 3305, 3309, or 3406.
- 12 — NON-BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

OFFICE MANAGEMENT OPTION

- 6 — OFFICE MANAGEMENT 3303, 3305.
- 12 — ADVANCED OFFICE MANAGEMENT ELECTIVES.
- 12 — NON-BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

* Students with educational goals which are not met by available options may submit their needs to the Department Chairman. A special program of study may be established with the approval of both the Chairman and the Dean of the College.

COURSE CLUSTERS UNDER THE BACHELOR OF BUSINESS ADMINISTRATION DEGREE

By careful use of the flexibility provided in the "elective" portion of options leading to the Bachelor of Business Administration degree, a student may cluster his electives around a selected industry or profession. These are all advising programs and a student interested in one of these clusters must seek special counsel from the listed advisor.

ADVERTISING (Marketing Option) – This program enables the student to earn the B.B.A. degree and to become knowledgeable about the techniques and practices of the primary advertising media.

Business Advisor: Mr. A. S. Gifford.

Other: Department of Mass Communications.

MANAGEMENT SCIENCE (General Business Option) – This program enables the student to earn the B.B.A. degree with an understanding of modern management concepts and techniques in a quantitative and computer oriented business environment.

Business Advisor: Dr. Edward George.

TEACHER CERTIFICATION (Office Management Option) – This program enables the student to earn the B.B.A. degree and to qualify for a secondary teaching certificate.

Business Advisor: Dr. Lola B. Dawkins.

Other: The School of Education.

SECRETARIAL (Office Management Option) – This program enables students to concentrate skill courses into the early part of progress towards the B.B.A. degree; it is possible to attain a statement of proficiency at a specific point in the curriculum.

Business Advisor: Dr. Lola B. Dawkins.



Teacher Education and Certification

Teacher education is one of the important purposes of The University of Texas at El Paso. Each teacher education program is concerned with the total education of the prospective teacher, emphasizing preparation for our American way of life, the development of moral and ethical character, and proficiency in the use of basic skills. All students are required to complete successfully a balanced program consisting of work in arts and science, academic specialization, and professional development. Each program represents the minimum course work which a student must complete to be eligible for degree and certification purposes.

The teacher certification laws of Texas, which became effective September 1, 1955, provide for two general types of certificates: the permanent provisional and the permanent professional. The permanent provisional certificate is based on a bachelor's degree and a prescribed state-approved certification program. The professional certificate is based on a minimum of an approved fifth or sixth year of graduate school work beyond the bachelor's degree.

Students interested in earning teachers' certificates should consult early with the Certification Officer in the School of Education.

The Texas Education Agency has approved specific programs in teacher certification for the various colleges of the State of Texas. Certificates can be obtained through a particular college only in those areas and fields so approved for that college. A student no longer can complete the elements of a particular program as set forth in State bulletins on teacher certification requirements and obtain a teaching certificate. These bulletins are now directed to colleges to guide the college in developing their certification programs. They are not directed to individual students or to individual applicants for teaching certificates.

The University of Texas at El Paso has approved provisional certificate programs at both the elementary and secondary school levels. In certain highly specialized fields, The University of Texas at El Paso has approved programs which will qualify the individual for teaching his special subject at both the elementary and the secondary school levels. These special area certificates carry what is known as an all-levels endorsement. The University of Texas at El Paso has approved all-levels programs in Art, Health and Physical Education, and Music. The student who wishes to earn the Bachelor of Arts degree with a major in some other field and who also wishes to qualify for a provisional certificate to teach at the secondary level should confer with the Dean of Education and the Dean of Liberal Arts. In the field of special education the University is approved for the provisional mentally retarded certificate.

The University of Texas at El Paso has approved *provisional* certificate programs as follows:

1. Elementary Education — there are two programs for this certificate, Programs A and B as outlined on page 72.
2. Secondary Education — there are two programs for this certificate, Programs A and B as outlined on page 73.
3. All-Levels Programs — these programs are described on pages 67, 68, and 69 of this catalog.
4. Mental Retardation Endorsement — program is described on page 73 of this catalog.
5. School Librarian.
6. Kindergarten Endorsement — this program is described on page 73 of this catalog.

The University of Texas at El Paso has *professional* certificate programs in the following areas:

1. Elementary Teaching.
2. Secondary Teaching.
3. School Administration.
4. Educational Supervisor.
5. Educational Diagnostician.
6. Counseling and Guidance.

A student who expects to receive a teaching certificate upon graduation must file an application with the Certification Officer at the beginning of the semester in which he intends to graduate.

Direct questions concerning certificates to Certification Officer.

All-Levels Teacher Programs

ART (Bachelor of Arts),
HEALTH & PHYSICAL EDUCATION (Bachelor of Science in Education), and Music (Bachelor of Music).

An all-levels teaching field may be selected from the three programs listed below.
(For additional information consult with the head of the department concerned.)

Semester
Hours

ART

ACADEMIC FOUNDATIONS (60 semester hours)

ARTS & SCIENCES (36 semester hours)

- 12 — ENGLISH 3111-12 * and 3211-12 or 3213-14 or 3215-16.
- 6 — HISTORY 3101, 3102.
- 6 — POLITICAL SCIENCE 3110, 3111.
- 12 — Twelve semester hours from two of the following:
SCIENCE — MATHEMATICS — FOREIGN LANGUAGES.

DEGREE REQUIREMENTS AND ELECTIVES (24 semester hours)

- 3 — SPEECH.*
- 3 — PHILOSOPHY 3208.
- 3 — ECONOMICS 3203 or SOCIOLOGY 3101.
- 3 — DRAMA 3113 or MUSIC 3124
- 12 — ELECTIVES.

PROFESSIONAL DEVELOPMENT

- 18 — ED. P.&C. 3301, 3310; ED. C 3302, 3311, 3496, 3498.

ACADEMIC SPECIALIZATION

- 51 — ART 3101, 3102, 3103, 3104, 3201, 3202, 3203, 3204, 3205, 3208, 3209, 3311, 3312, 3321, 3322, plus 6 advanced hours.
A minimum total of 132 semester hours including 30 advanced hours.

*A grade point average of not less than a 2.0 is required in both English 3111-12 and any three hours of speech. Any student declared deficient in English or Speech by the certifying committee or major department may be required to complete or repeat additional English and Speech courses regardless of his grade point average.

HEALTH AND PHYSICAL EDUCATION**ACADEMIC FOUNDATIONS** (67 semester hours)Semester
Hours**ARTS & SCIENCES** (33 semester hours)

- 12 — ENGLISH 3111-3112^o and 3211-12 or 3213-14 or 3215-16.
- 6 — HISTORY 3101, 3102.
- 6 — POLITICAL SCIENCE 3110, 3111.
- 3 — SPEECH.^o
- 3 — MATHEMATICS.
- 3 — CHEMISTRY.

DEGREE REQUIREMENTS AND ELECTIVES (34 semester hours)

- 15 — HEALTH EDUCATION 3201, 3302, 3401, and six semester hours of physical education skills courses.
- 13 — BIOLOGY 3105-1107, 3106-1108, 4211-1212.
- 6 — ELECTIVES.

PROFESSIONAL DEVELOPMENT (18 semester hours)

- 12 — ED. P&G 3301, 3310; ED. C 3311, and 3302 or 3306 or 3403 or 3412.
- 6 — PHYSICAL EDUCATION 3496, 3498.

ACADEMIC SPECIALIZATION (58 semester hours)

- 34 — PHYSICAL EDUCATION 3103, 3205, 3206 (Men), 3207 (Men), 3215 (Women), 3316 (Women), 3303, 3304, 3305, 3311, 3312, 4301, and 3408 or 3414.
- 24 — Second Teaching Field, 12 hours of which must be advanced.

A minimum total of 128 semester hours including 30 advanced hours.

^oA grade point average of not less than a 2.0 is required in both English 3111-12 and any three hours of speech. Any student declared deficient in English or Speech by the certifying committee or major department may be required to complete or repeat additional English and Speech courses regardless of his grade point average.

MUSIC EDUCATION (Bachelor of Music)

All music majors must declare a major performing medium.

Placement and Proficiency Auditions in piano, voice, and major instrument are required of all music majors. A private interview and a proficiency test are required in music theory to determine the level of study. Advanced Placement is possible.

Students are expected to avail themselves of pre-teaching experiences during their sophomore, junior and senior years with the select Boy Choir (ages 8 through 18), the "Monotone" Clinic, and the Recorder Ensembles maintained on campus.

Music Majors transferring from another institution must pass proficiency tests on their major and secondary instruments, piano, and conducting.

It is recommended that a student who has part-time employment reduce his academic load by 3 semester hours for each 10 hours per week he works.

For detailed requirements and course sequence for music majors and minors, consult the Music Department Handbook with the Department Chairman.

ACADEMIC FOUNDATIONS (60 semester hours)

Semester Hours

- 12 — ENGLISH 3111-12 * and 3211-12 or 3213-14 or 3215-16.
- 6 — HISTORY 3101, 3102.
- 6 — POLITICAL SCIENCE 3110, 3111.
- 12 — Twelve semester hours from at least two of the following:
SCIENCE — MATHEMATICS — FOREIGN LANGUAGES.

DEGREE REQUIREMENTS AND ELECTIVES (24 semester hours)

- 3 — FOREIGN LANGUAGE DICTION 3190 (Choral Plan only).
- 3 — SPEECH 3101 or 3102 *.
- 6 — MUSIC LITERATURE 3121 and 3321.
- 3 — MUSIC THEORY 3113 (acoustics).
- 12 — ELECTIVES

PROFESSIONAL DEVELOPMENT (22 semester hours)

- 12 — EDUCATION 3301 and 3310; in addition to 3 hours from 3302, 3303, 3304, 3305, 3307 or 3407; and 3 hours from 3420 or other Secondary Education courses.
- 10 — MUSIC EDUCATION 1201 (4 semester hours), 3496, 3498.

ACADEMIC SPECIALIZATION

PLAN	PLAN	(C — Choral Plan, 56; I — Instrumental Plan, 60)
18	18	— THEORY 1111, 1112, 3114; 1211, 1212, 3213, 3214; 2315; 3411 (Choral Plan), or 3412 (Instrument Plan).
12	12	— MUSIC EDUCATION 3331, 3333, 3336, 3433.
—	12	— MAJOR INSTRUMENT (Orchestra or Band Majors), including a minimum of 2 advanced semesters. Students are required to study every semester in residence.
—	6	— PIANO.
—	2	— VOICE.
—	10	— LOW STRINGS 2175, HIGH STRINGS 2176, REEDS 2177, BRASSES 2178, PERCUSSION 2179.
12	—	— MAJOR INSTRUMENT (Voice, Guitar, or Keyboard instruments), including a minimum of 2 advanced semesters. Students are required to study every semester in residence.

The University of Texas at El Paso

- 8 — — SECONDARY INSTRUMENT (Voice or Piano). Guitar Majors take Piano.
- 6 — — Additional applied music, including Vocal Pedagogy 2493. (Guitar Majors take 6 hours of Voice in addition to 2493; Voice and Keyboard Majors include Guitar 1175).
- — — Participation for 8 semesters or each semester in residence in the ensemble of the major instrument. For exceptions, petition the Music Faculty in writing.
- — — Instrumental Plan requires one year of Chorale or Chorus, and four semesters of Chamber Music.
- — — Keyboard Major requires four semesters of Chamber Music and Accompanying (3 of accompanying).
- — — Qualified bandsmen interested in preparing to direct orchestra must meet minimum participation requirements in orchestra, and vice versa.
- — — Recital participation and/or attendance is required every semester in residence and is considered laboratory for other music courses. Music Education Majors must present a partial recital.
- — — A minimum total semester hours of 138 (Choral Plan), or 142 (Instrumental Plan).

*A grade point average of not less than a 2.0 is required in both English 3111-12 and Speech 3101 or 3102. Any student declared deficient in English or Speech by certifying committee or major department may be required to complete or repeat additional English and Speech courses regardless of his grade point average.

Bachelor of Science in Education

(Program A or B must be selected and completed)

REQUIREMENTS IN ACADEMIC FOUNDATIONS FOR ELEMENTARY EDUCATION, SECONDARY EDUCATION, AND SPECIAL EDUCATION

Minimum Semester Hours		ACADEMIC FOUNDATIONS:
PROGRAM A	PROGRAM B	
		ARTS AND SCIENCES (36 semester hours)
12	12	ENGLISH 3111-12 ^o or LINGUISTICS 4101-02 and 3211-12 or 3213-14 or 3215-16.
6	6	HISTORY 3101, 3102.
6	6	POLITICAL SCIENCE 3110, 3111.
12	—	Twelve semester hours from two of the following: SCIENCE — MATHEMATICS — FOREIGN LANGUAGES.
—	6-14	FOREIGN LANGUAGE: Completion of 3201-02.
—	6	MATHEMATICS.
		DEGREE REQUIREMENTS AND ELECTIVES (30 semester hours)
6	—	EDUCATION A 3101 or Ed. C 3437, Ed. P&C 3201.
3	3	SPEECH 3101, ^o 3103, ^o † or 3104 ^o †.
6	—	Six semester hours from two of the following fields: Philosophy 3203 or 3206; Economics 3203; Sociology 3101 or 3102 or 3215.
6	12	LABORATORY SCIENCES.
—	3	ECONOMICS.
—	3	PHILOSOPHY 3203 or 3206.
—	3	PSYCHOLOGY 3101.
3	—	MATHEMATICS.
6	6	ELECTIVES.

^o A grade point average of not less than 2.0 is required in both English 3111-12 and Speech 3101. Any student declared deficient in English or Speech by the certifying committee or major department may be required to complete or repeat additional English and Speech courses regardless of his grade point average.

† Speech 3103 is recommended for the Elementary Education major. Speech 3104 is recommended for bilingual students wishing to improve their oral English.

ADMISSION TO THE PROGRAMS OF SECONDARY EDUCATION, ELEMENTARY EDUCATION, AND MENTAL RETARDATION

Before a student may be admitted to teacher education by having a degree plan made for the degree of bachelor of science in education, it will be necessary for him to satisfy certain School of Education screening requirements and secure a written recommendation for admission to teacher education. Acceptable standards must be maintained throughout the college career of the student as well as at the time of admission to teacher education.

Bachelor of Science in Education

ELEMENTARY EDUCATION

<i>Minimum Semester Hours</i>		
PROGRAM A	PROGRAM B	
66	66	ACADEMIC FOUNDATIONS (see page 71)
		ACADEMIC SPECIALIZATION , complete Plan I or II.
		PLAN I:
18	18	Teaching Subjects,* complete one teaching subject listed on page 74 under Teaching Subjects, Elementary Education, Plan I.
18	18	Combination Subjects,† complete 18 semester hours from the following: Art Education 3311, Drama 4350, Linguistics 3308, English 3220, Mathematics 3302, Music Education 3334, Geography 3110, Physical Education 3205, Health Education 3302, Linguistics 3220, not more than 6 hours of mathematics and/or natural science and/or modern languages.
		PLAN II:
24	24	Teaching Subject,* complete one teaching subject listed on pages 74 and 75 under Teaching Subjects, Elementary Education, Plan II.
12	12	Combination Subjects,† complete 12 semester hours from the following: Art Education 3311, Drama 4350, Linguistics 3308, and/or 3220, Mathematics 3302, Music Education 3334, Geography 3110, Physical Education 3205, Health Education 3302, Linguistics 3220, not more than 6 hours of mathematics and/or natural science and/or modern languages.
		PROFESSIONAL DEVELOPMENT
18	18	Ed. P.&G. 3301, 3420; Ed. C 3302, 3306, 3496-97
		ELEMENTARY CONTENT
12	12	From: Ed. C 3303, 3304, 3305, 3404 or 3408, † 3405 — 12 semester hours.
§	§	ELECTIVES to make a minimum of 132 semester hours.

*Teaching subjects include courses in Academic Foundations.

†Combination Subjects may not include courses in Academic Foundations.

§Varies according to student's needs and capabilities.

NOTE: A grade point average of not less than 2.5 is required in Education classes in both Programs A and B.

Bachelor of Science in Education

SECONDARY EDUCATION

<i>Minimum Semester Hours</i>		
PROGRAM A	PROGRAM B	
66	66	ACADEMIC FOUNDATIONS (see page 71)
48	48	ACADEMIC SPECIALIZATION , complete Plan I or II. PLAN I: Secondary Teaching Fields,* complete two teaching fields listed on pages 75 and 76 under Teaching Fields, Secondary Education, Plan I. (A grade average of not less than 2.5 is required in each teaching field.) PLAN II: Secondary Composite Teaching Field,* complete one composite teaching field on page 76 under Composite Teaching Fields, Secondary Education, Plan II. (A grade average of not less than 2.5 is required in the composite teaching field.)
18	18	PROFESSIONAL DEVELOPMENT Ed. P&G 3310, Ed. C 3311, Ed. C 3312 or 3408, Ed. P&G 3420, Ed. C 3498-99. ELECTIVES to make a minimum of 132 semester hours.

* Secondary teaching fields and secondary composite teaching fields may include courses in Academic Foundations.

§ Varies according to student's needs and capabilities.

NOTE: A grade point average of not less than 2.5 is required in Education classes in both Programs A and B.

MENTAL RETARDATION ENDORSEMENT

Complete all requirements in Program A or B in Elementary Education (see page 72) except for Electives in Academic Foundations (see page 71).

Plus Ed. P&G 3409, Ed. P&G 3421, Ed. P&G 3422, Ed. P&G 3429.

Plus Electives to make a minimum of 132 semester hours.

NOTE: A grade point average of not less than 2.5 is required in Education classes in this program.

KINDERGARTEN ENDORSEMENT

Complete all requirements in Program A or B in Elementary Education (see page 72) except for Electives in Academic Foundations (see page 71).

Ed. P&G. 3401, Ed. C. 3451, 3452 and 3491 (Ed. C. 3491 must be taken concurrently with Ed. C. 3496).

Electives to make a total of 132 semester hours.

Teaching Subjects: Elementary Education

Consult adviser in School of Education concerning selection of courses.

PLAN I

ART – Art 3101, 3102, 3103, 3104, 3311, 3312, 3321	Total: 21 hours
BIOLOGICAL SCIENCES – Biology 3105-06, 1107-08, 3216 plus 9 advanced hours	Total: 20 hours
ECONOMICS – Economics 3203, 3204, 3302 or 3303, plus 9 advanced hours	Total: 18 hours
GEOLOGY – Geology 3103, 3104, 3205, 3305, 3405, and 3421 . . .	Total: 18 hours
HEALTH AND PHYSICAL EDUCATION – P.E. 3205, 3316 or 3408, 3303 or 3311 or 3312, 3 Skills Courses. H.E. 3201, 3302 .	Total: 18 hours
HISTORY – History 3101, 3102, 3201 or 3202, plus 9 advanced hours	Total: 18 hours
MATHEMATICS – Mathematics 3101, 3120, 3201, plus 9 advanced hours	Total: 18 hours
POLITICAL SCIENCE – Political Science 3110, 3111, plus 12 hours of which 9 are advanced	Total: 18 hours
PSYCHOLOGY – Psychology 3101 and at least 6 hours from 3103, 3202, 3206, 3304, plus at least 9 hours from: 3302, 3306, 3308, 3310	Total: 18 hours
PHYSICS – Physics 3101, 3102, 4107, plus 9 hours from Physics 3331, 2343, 3470, 1-6475	Total: 19 hours
READING – Ed. C 3404, 3408 and 3441, and 9 hours from the fol- lowing: 3423, 3424, 3425, 3426, 3449, 3450, 3480	Total: 18 hours
SPEECH – Six hours of foundation courses in Speech; Speech 3210, 3333, plus 6 advanced hours in Speech	Total: 18 hours
SOCIOLOGY – Sociology 3101, 3102, 3304, plus 9 advanced hours	Total: 18 hours

PLAN II (24 semester hours in one subject.)

ART – Art 3101, 3102, 3103, 3104, 3311, 3312, 3321, 3322	Total: 24 hours
BIOLOGICAL SCIENCES – Biology 3105-06, 1107-08, 3216, plus 13 advanced hours	Total: 24 hours
CHEMISTRY – Chemistry 3105-06, 2106, 4213, plus 12 advanced hours	Total: 24 hours
SPEECH – Nine hours of foundation courses in Speech; Speech 3210, 3333; plus 9 advanced hours in Speech	Total: 24 hours
ECONOMICS – 3203, 3204, 3302, or 3303; plus 15 advanced hours	Total: 24 hours
ENGLISH – English 3111-12, 3211-12; Linguistics 3307, 3311-12, plus three additional hours of advanced English. (If the stu- dent was exempted from English 3111 by examination, he would be required to take three hours of advanced English in addition to the above to complete the total 24 hours required)	Total: 24 hours
FRENCH – French 4101-02, 3201-02, 3357, plus nine advanced hours. Non-native speakers are advised to complete three hours of French 3110	Total: 26 hours
GEOLOGY – Geology 3103, 3104, 3205, 3305, 3405, 3421 plus 6 advanced hours from Geology 3325, 3359, 3455, 3470, 3462, or 3466	Total: 24 hours

EDUCATION MAJORS

GERMAN – German 4101-02, 3201-02, 3357, plus 9 advanced hours	Total: 26 hours
HEALTH AND PHYSICAL EDUCATION – P.E. 3103, 3205, 3408 or 3414, 3316, 3303 or 3311 or 3312, and 3 skills courses H.E. 3201, 3302	Total: 24 hours
HISTORY – History 3101, 3102, 3201, 3202, plus 12 advanced hours	Total: 24 hours
MATHEMATICS – Mathematics 4110, 4111, 3212, plus 13 hours of which 12 are advanced	Total: 24 hours
PHYSICS – Physics 3101, 3102, (or 4107, 4108) 4103, 4104, plus 12 hours from 3331, 3333, 2343, 3470, and 1-6475	Total: 26 hours
POLITICAL SCIENCE – Political Science 3110, 3111, plus 18 hours of which 12 are advanced	Total: 24 hours
SOCIOLOGY – Sociology 3101, 3102, 3215 and 3304, and 12 advanced hours	Total: 24 hours
SPANISH – Spanish 4101-02, 3201-02, 3357, 3400, plus three hours from Spanish Literature; plus three hours from Spanish Amer- ican Literature. Non-native speakers are advised to complete three hours of Spanish 3110	Total: 26 hours

Teaching Fields: Secondary Education

Consult adviser in School of Education concerning selection of courses.

PLAN I (24 semester hours in a field, 12 hours of which must be advanced)

BIOLOGICAL SCIENCES – Biology 3105-06, 1107-08, 3214, 1215, 3216, 1217, 3318, 1319, 3320, 3321 plus 3 advanced hours	Total: 29 hours
CHEMISTRY – Chemistry 3105-06, 4213, 4324, 4325, 3430, plus 3 advanced hours	Total: 26 hours
DRAMA – Drama 3113; 3 hours of Drama 1111; 4 hours of Acting (Drama 4213, 4214); 4 hours of Directing (Drama 4325, 4425.); 8 hours of Technical Theatre (Drama 4215, 4221, 4332, 4342); and 6 hours of History and Criticism (Drama 3357, 3358, 3440)	Total: 28 hours
ENGLISH – English Literature 3211-3212, 6 hours; American Lit- erature 3311-3312 or Analysis of Literature 3213-3214, or World Literature 3215-3216, 6 hours; Folklore 3372 or Folk- lore of the Mexican American 3374, 3 hours; Shakespeare: Earlier Plays 3320, 3 hours; Advanced Composition 3365, 3 hours; Foundations of English Language 3419 or Structure of English (Linguistics) 3307, 3 hours	Total: 24 hours
GEOLOGY – Geology 3103, 3104, 3205, 3110, 3305, 3405, 3421, plus 3 advanced hours from 3455, 3359, 3462, 3466, or 3470	Total: 24 hours
FRENCH – French 3201-02,* 3301, 3303, 3357, 3401, plus 9 ad- vanced hours	*Total: 27 hours
GERMAN – German 3201-02,* 3301, 3303, 3357 and 3401 plus 9 ad- vanced hours	*Total: 27 hours
HEALTH EDUCATION – H.E. 3101, 3201, 3202, 3301, 3303, 3307, 3401, 3402, 3403	Total: 27 hours
HEALTH AND PHYSICAL EDUCATION – P.E. 3206 or 3207 (Men), 3303, 3304, 3305, 3311, 3312, 3316 (Women), and 6 hours of skills courses. H.Ed. 3401	Total: 27 hours

*NOTE: Courses 4101 and 4102 are prerequisite for 3201; credit for 4101-02 can be earned by completing the courses or by examination. For teacher certification requirements the University Council on Teacher Education Certification has established the following policy: specific course and hour requirements may be met by examinations for credit or other procedures used by Departments to recognize proficiency and permit advanced placement. If the student has to take 4101-02 the modern language teaching fields will total 35 hours.

HISTORY – History 3101, 3102, 3201, 3202, plus 12 advanced hours	Total: 24 hours
JOURNALISM – 2 hours of Publications 1204; Journalism 3201, 3202, 4207, 3312, 3350; Journ. 3305, plus 3 advanced hours	Total: 24 hours
MATHEMATICS – Mathematics 4110, 4111, 3212, 3217, plus 12 advanced hours including Mathematics 3325 and 3341	Total: 26 hours
PHYSICS – Physics 1101, 1102, 1201, 3115, 4216, 3217, plus 12 advanced hours	Total: 25 hours
POLITICAL SCIENCE – Political Science 3110, 3111, 6 additional hours, plus 12 advanced hours	Total: 24 hours
SECRETARIAL SCIENCE – Office Management 3102, 3104, 3308, 3498, 3499, plus 9 hours from the following: Office Manage- ment 3301, 3302, 3304, 3305, 3306, including enough ad- vanced courses to make a total of 12 semester hours of ad- vanced credit	Total: 24 hours
SPANISH – Spanish 3201-02,* 3302, 3301 or 3303, 3320 or 3322, 3357, 3400 or 3401, 3472, plus 3 advanced hours	*Total: 27 hours
SPEECH – In consultation with a departmental advisor, 9 hours of Speech Foundations courses plus 15 hours of which 12 are advanced	Total: 24 hours

*NOTE: Courses 4101 and 4102 are prerequisite for 3201; credit for 4101-02 can be earned by completing the courses or by examination. For teacher certification requirements the University Council on Teacher Education Certification has established the following policy: specific course and hour requirements may be met by examinations for credit or other procedures used by Departments to recognize proficiency and permit advanced placement. If the student has to take 4101-02 the modern language teaching fields will total 35 hours.

Composite Teaching Fields: Secondary Education

PLAN II (48 semester hrs. in a composite field, 18 hrs. of which must be advanced)

BUSINESS – Office Management 3102, 3104, 3308, 3498, 3499; plus 9 hours from 3301, 3302, 3303, 3304, 3305, 3306; plus 15 hours from Accounting 3101, 3102, Marketing 3300, Manage- ment 3301, 3302, Statistics 3201, General Business 3203, Business Law 3301, Finance 3310, plus 9 hours of elective courses selected from Accounting, General Business, Business Law, Marketing, Management, and Statistics to make a total of 12 hours of advanced credit	Total: 48 hours
SCIENCE – Thirty hours from Biology 3105-06, 1107-08; Chemistry 3106, 2106, 4213; Geology 3103-04, 3205; Physics 4103, 4104. Completion of one of the following: (1) Biology 3214,** 1215, 3216, 1217, 3318, 1319, 3320, 3321, Biology – 3 advanced hours. (2) Geology 3305, 3405, 3421, plus 9 advanced hours from: 3455, 3359, 3466, 3470; (3) Physics: 18 advanced hours from 3331, 3333, 2343, 3325 (or 3326)) 3470, and 1-6475 or other advanced physics courses; (4) Chemistry 1321-2, 3321-2, 3430-31	Total: 48 hours
SOCIAL STUDIES – History 3101, 3102, 3201, 3202, plus twelve advanced hours; Political Science six advanced hours; Soci- ology 3101, 3102, plus three advanced hours; Economics 3204, plus three advanced hours; Geography 3110	Total: 48 hours
SINGLE TEACHING FIELD: ENGLISH – Prerequisite: English 3111, 3112, 3211, 3212 under Academic Foundations. English 3215, 3216, 3311, 3312, 3220, 3455 (Literature), 3455 (Composition). Complete 6 semester hours advanced Literature, 3 semester hours advanced Linguistics, History 3353, 3354, Ed. C. 3408, Speech 3205, 3307. Either Drama 3113 or Speech 3334	Total: 48 hours Above Foundations

** Chemistry 3105-06, 2106 prerequisite.



THE GRADUATE SCHOOL



(See the GRADUATE BULLETIN for the requirement of each department.)

Master of Arts degrees are offered in Drama and Speech, Economics, Education, English, History, Political Science, Psychology, Sociology, and Spanish.

Master of Education degree with programs in Professional School Administration, Elementary and Secondary Supervision, Counseling, Elementary and Secondary Teaching (with or without Professional Certificate).

Master of Science degree in Biology, Chemistry, Engineering, Geology, Health and Physical Education, Mathematics, and Physics.

FINANCIAL ASSISTANCE. — Scholarships, assistantships, fellowships and loan funds are available. Graduate Scholarships up to \$2,500 are available to students of exceptional qualifications. Applications should be made to the Dean of the Graduate School. Assistantships up to \$2,500 to \$2,750 are handled by the departments. Other grants and student loans are administered by the Financial Aid and Placement Office.

Applications for scholarships are due on February 1, May 1, and October 1. The February 1 awards will be for the next academic year. The May 1 awards will be for the following summer and the October 1 awards will be for the following spring.

PROCEDURES AND REQUIREMENTS FOR ADMISSION

Applications for admission are made in the office of the Dean of the Graduate School where forms may be secured. Graduates of U.T. El Paso must supply two complete official transcripts. Graduates of other schools must provide three complete transcripts — one for the office of the Registrar, one for the Office of the Dean, and one for their Graduate Adviser. Each applicant must also have his score on the Graduate Record Examination Aptitude Test sent to the Dean's office. The application for admission to a degree program cannot be acted upon until these scores and these transcripts have been received.

These records will be examined by the Departmental Committee on Graduate Studies, and the candidate will be notified by the Graduate Dean.

There are five basic requirements for admission: (1) a bachelor's degree from an accredited institution in the United States, or proof of equivalent training at a foreign institution; (2) a satisfactory grade point average in upper division (junior and senior level) work, and in any graduate work already completed; (3) a satisfactory score on the Graduate Record Examinations Aptitude Test; (4) adequate subject preparation for the proposed graduate major; and (5) acceptance by the Committee on Graduate Studies of the proposed major department. The Graduate Dean reserves

the right to examine any application and, at his own discretion, regardless of other criteria, instruct the Registrar to accept it.

DEADLINE FOR SUBMISSION OF APPLICATION.—Individuals holding bachelor's degrees from The University of Texas at El Paso should apply for admission at least thirty days prior to the beginning of the semester or summer session in which they plan to register. Those with degrees from other American universities or colleges should file their applications, along with official transcripts of all previous college or university work, at least sixty days in advance. Foreign students should apply much earlier. All correspondence relating to their applications must be *completed* sixty days before the beginning of the semester or summer session. All foreign students must take the advanced section of the Graduate Record Examination.

Students from non-English-speaking foreign countries must take a satisfactory score on the Test of English as a Foreign Language (TOEFL) given by the Educational Testing Service.

THE GRADUATE RECORD EXAMINATIONS APTITUDE TEST.—The Aptitude Test of the Graduate Record Examinations is designed to test preparation and aptitude for graduate study, and it must be passed with a satisfactory score by every one seeking admission to the Graduate School. Students are encouraged to take the advanced part of the test for their major. The test is taken at the applicant's own expense and is given six times a year, usually in October, December, January, February, April, and July. On each of the six appointed dates, it is administered at The University and at approximately 500 other designated centers in the United States and abroad. Some twenty-five other colleges and universities also administer the test, but less than six times annually. An informational booklet and an application blank may be obtained from the Testing and Counseling Center at the University. Since applications for the tests must be received in Princeton about eighteen days before each testing date, applicants should secure the booklet and application blank at least a month in advance.

GRADE-POINT AVERAGE.—An applicant with a 3.00 average (on the scale of 4.00) on all work of upper division (junior and senior) and graduate level previously taken has satisfied the minimum requirements of the Graduate School in this regard. Some applications showing less than a 3.00 average may nevertheless be accepted upon special recommendation of departmental Graduate Advisers.

ACCEPTANCE BY THE COMMITTEE ON GRADUATE STUDIES.—Students meeting other requirements for admission may nevertheless be denied admission by the Departmental Committee on Graduate Studies in their proposed area of study, when there are more qualified applicants than can be ac-

commodated in the available facilities, or adequately instructed by the available faculty.

CONDITIONAL ADMISSION.—A student desiring to work towards an advanced degree in an area in which his undergraduate training is insufficient may be admitted with the understanding that he must undertake course work and other study to make up the deficiencies noted by his Graduate Adviser, and that such make-up work will be *in addition* to the regular degree requirements.

When a student with less than minimum grade-point average or with a less than satisfactory Graduate Record Examinations Aptitude Test score, is admitted on the recommendations of a Graduate Adviser, then that Graduate Advisor will assign the first 12 semester hours the conditional student is to take; frequently he will assign special conditions regarding the number of semester hours to be taken and specific grade-point average to be maintained. If these conditions are not met, the student will be barred from subsequent registration in the Graduate School. Only in the most exceptional cases will conditional students be allowed to drop an assigned course.

ENROLLMENT IN GRADUATE COURSES WITHOUT ADMISSION TO GRADUATE SCHOOL. — Individuals holding the baccalaureate degree may, by an arrangement of the Registrar, enroll in graduate courses (with permission of the instructor) even though they do not wish to enter the Graduate School or have been denied admission to it. However, students who have completed a baccalaureate degree and have subsequently registered as special students will not be permitted to list any of the work taken prior to admission to the Graduate School in graduate programs without specific approval of the Graduate Studies Committee of the department and the Graduate Dean. Such approval is rarely given.

PROCEDURES AFTER ADMISSION

The successful applicant will be informed by mail about his admission, any conditions imposed on it, and his Adviser. The student should then at his earliest opportunity get in touch with his Adviser. The student must have his course program approved *each* semester by the official Graduate Adviser of his major department before he can register for courses.

GRADES AND GRADE-POINT AVERAGE.—Credit is given in the Graduate School for the grades A, B, and C. Every semester hour of C, however, must be balanced by one of A, because the degree candidate is required to present an overall grade-point average of 3.00 at the end of his program of study. In the event that a graduate student making a D is allowed to

continue, the D must be balanced by two A's. An F must be balanced by three A's. Only upper division and graduate level courses taken in *graduate status* at The University, or reserved in the senior year for graduate credit (except thesis and dissertation courses) are counted in the average. Nor will a grade of A in a Thesis course or in a specifically authorized seminar, conference or research course which involves a report in lieu of a thesis be used to offset a C.

In some courses the standard grading system is not practicable; such courses are not counted in the grade-point average.

The symbol *Inc*, reported in cases where the student has not completed all the assignments in a course before its conclusions, is valid for one year. Before the end of this time the student must turn in the required work for a regular grade. Otherwise the *Inc* is changed automatically to an *F*.

Master's degree candidates must maintain, within the overall grade-point average, a 3.00 average in all upper division and graduate courses in the major and in the minor, respectively. High grades in courses outside the major and minor will not serve to bring up these averages. On the other hand, high grades in the major and minor may raise the overall average, provided they are in upper division or graduate courses.

MAXIMUM COURSE LOAD.—The maximum course load for a graduate student is fifteen semester hours, or six semester hours in a summer session; registration in excess of these maxima must have the special consent of the Dean and will be permitted only under exceptional circumstances. If the student is employed by The University as a teaching assistant, research assistant, or student assistant, his course load must be correspondingly reduced. The student should consult his Graduate Adviser about his combined course and work load.¹

ADDING AND DROPPING COURSES, AND WITHDRAWAL FROM THE UNIVERSITY.—Exact information can be obtained from the Office of the Graduate Dean.

CONTINUATION IN THE GRADUATE SCHOOL.—Registration in the Graduate School beyond the first semester (or summer session) is dependent on two main factors: (1) satisfactory progress in absolving any admission conditions that were imposed and (2) maintenance of a 3.00 grade-point average for all upper division and graduate courses taken in a given semester. Should a graduate student make less than a 3.00 grade-point average in a given semester or summer session, his continuance is in jeopardy. During the next semester or summer session in which he is registered he

¹ Credit for supervised teaching is not counted in determining combined course and work load.

must be able to maintain a 3.00 grade-point average, or he will be automatically dismissed at the end of it.

The graduate student who has been dismissed may be readmitted for further graduate study only by petition of the Committee on Graduate Studies of his department or area. This petition will be considered, and approved or disapproved, by the Dean of the Graduate School.

REQUIREMENTS FOR DEGREES

RESIDENCE.—The minimum requirement for any degree is two semesters or the equivalent, which need not be consecutive.

A graduate student may register for certain courses without being resident (physically present) at The University. These include conference courses (with permission of the instructor) and thesis courses.

No student may receive advice and assistance from a member of the faculty in the preparation of his thesis without being registered (if necessary, for multiple semesters) for the appropriate thesis course.²

EXTENSION.—Work done in extension classes, up to a limit of six semester hours, upon recommendation of the Departmental Committee on Graduate Studies and approval of the Dean, may be allowed for graduate credit, provided that (1) the courses and instructors are approved by the Graduate School and the department in which the student would have otherwise taken the work on campus and (2) the applicant, before taking the extension course, be accepted for admission to the Graduate School and approved by the Dean for the courses desired.

Correspondence courses are not accepted for graduate credit.

RESERVATION OF WORK BY UNDERGRADUATES FOR GRADUATE CREDIT.—Ordinarily, undergraduates are barred from graduate courses. A student who has a bachelor's degree is not eligible to reserve courses for graduate credit. It is possible for undergraduate seniors to register in graduate courses in their last semester under the following conditions:

- (1) The undergraduate must lack not more than twelve semester hours³ of work to complete all requirements for his (first) bachelor's degree and must have a grade average of at least 3.0 in his junior and senior courses.
- (2) These twelve hours (or less) must all be completed in the same semester or summer session in which he is taking the graduate courses.
- (3) Total registration for all work must not exceed fifteen semester hours (or six hours in a summer session).

² Registration for the master's thesis course must have covered a longer period than one semester (or two summer sessions).

³ Or six semester hours in a summer session.

- (4) All registration for graduate courses must be approved at the time of registration by the Graduate Adviser of the department and the Dean.

The undergraduate cannot count his work in graduate courses toward his bachelor's degree. It will be *reserved for credit* toward a graduate degree. A form for reserving courses, which needs the signature of the undergraduate dean and the official Graduate Adviser in the student's major area must be secured from the Graduate Dean's Office.

COURSES COUNTED FOR ANOTHER DEGREE.—No course counted toward another degree may be counted toward a graduate degree, either directly or by substitution.

Work done for the master's degree may be included in the work for the degree of Doctor of Philosophy provided it is acceptable to the candidate's supervising committee.

TRANSFER OF CREDIT.—Ordinarily all work for the Master's Degree must be done at The University. Except as noted in the next paragraph, a maximum of up to six semester hours of graduate course work may be transferred from another institution on the approval by the Committee on Graduate Studies in the student's major area and the Dean. In cases where such transfer is approved, the student must still meet the residence requirements of two full semesters or the equivalent.

It is the policy of The University of Texas System that all academic institutions within The System may accept graduate credit or equivalent course level from each other, and the regular requirements on residency are adjusted accordingly.

ENGLISH REQUIREMENTS.—Students admitted to the Graduate School are expected to write papers and examinations in English. For admission to some areas of graduate study the student is required to pass an examination in English; in other areas his proficiency in written and spoken English will be checked in his courses and in his contacts with faculty members.

TIME LIMITS AND CATALOGUE CHANGES.—All requirements for a master's degree must be completed *within one six-year period*. Work over six years old is lost and can be reinstated only by special permission of the Dean upon recommendation of the Committee on Graduate Studies.

General and specific requirements for degrees in the Graduate School may be altered in successive catalogues, but the student is bound only by the requirements of the catalogue in force at the time of his admission, within a six-year limit. At his discretion he may choose to fulfill the requirements of a subsequent catalogue.

GRADUATION DATES.—Degrees will be conferred at the end of each semester and at the end of the summer session. Formal commencement exercises are held only at the end of the spring semester. Those who wish to participate in the commencement ceremonies in June should so indicate by entering the appropriate date on the application for diploma and arranging for their cap and gown. Students intending to graduate should pay a diploma fee before October 30, March 30, or July 20 at the Business Office. The receipt given by the Business Office must be taken to the Office of the Graduate Dean for the ordering of the diploma. This fee is not refundable if the student does not graduate on the date he selects.

TWO DEGREES AT SAME LEVEL.—The Graduate School discourages all students from working toward more than one graduate degree at the same level.

PETITION OF CANDIDACY.—At the end of the first semester of full time study, or completion of the first 12 hours of graduate work, each student must submit to the Office of the Dean a Petition of Candidacy signed by the Departmental Graduate Adviser. The Petition shall show the courses taken and the courses required by the department before graduation. Copies of the Petition of Candidacy are available in the Office of the Dean.

GENERAL REQUIREMENTS FOR ALL MASTERS DEGREES

PREREQUISITES.—Every Master of Arts, Master of Education, and Master of Science program is based on the assumption that the students participating in it already possess a general college education up to the baccalaureate level. Accordingly the first prerequisite for the entering student is a baccalaureate degree from an accredited institution (or, for foreign and special students, proof of equivalent training). A second prerequisite is that the entering student must have taken at least twelve semester hours of *advanced* undergraduate courses in the area or school in which he proposes to pursue a graduate major. Some areas may require more semester hours of undergraduate preparation. If a student without adequate preparations still wishes to enter a given graduate program, his admission will be *conditional* only, *i.e.*, he will be obliged to take whatever courses of preparatory work which may be designated by his Graduate Adviser, and these courses will be in addition to the thirty hours (or more) required for the master's degree itself.

ENTERING EXAMINATION.—The Committee on Graduate Studies in the student's major area or department may, at its discretion, examine the student on his undergraduate preparation before his application to enter the program is approved.

REQUIREMENTS.— For any master's degree at least thirty semester hours of upper division and/or graduate instruction, or the equivalent, are required; nine semester hours of upper division courses are the maximum allowable in any individual's program and not more than six semester hours may be included in either the major or the minor. Eighteen to twenty-four semester hours, including the thesis, must be in the major area of instruction. The minor consists of a minimum of six hours in a supporting subject or subjects outside the major area. The relative number of hours in the major and minor fields, as well as the nature of the supporting work, will be determined in consultation with the student's Graduate Adviser. Every proposed program of work needs the approval of the Dean.

THESIS.—The candidate for the master's degree writes his thesis under the direction of a supervising instructor, who is chairman of a supervisory committee appointed by the Dean. The thesis is subject to the approval of the committee and ultimately to the approval of the Dean. The researching and writing of the thesis involves six semester hours of credit, but with special permission of the supervising committee and the Dean nine semester hours of credit may be given to it. Course 3598 must precede Course 3599.

SUBSTITUTIONS FOR THE THESIS.— In certain instances, substitutions for the formal thesis may be recommended to the Dean by the appropriate Committee on Graduate Studies. Such substitutions may include internship reports (where the internship is approved as an essential part of the graduate program by the Dean) or reports prepared in certain graduate seminar- or conference-type courses. In every instance, such a substitution for the thesis must have the prior approval of the Graduate Dean. Reports should be comparable to the thesis in every respect except for evidence of original research. It is required that the report be:

- (1) from a *specifically authorized* seminar, conference, or research course which has the prior approval of the Dean of the Graduate School;
- (2) reviewed and accepted by a supervising committee appointed by the Dean's office;
- (3) upon acceptance of the report by the official committee, the candidate must submit two copies, entirely comparable to a thesis in terms of format, quality of paper, typing, binding, etc. to the Office of the Graduate Dean.

FINAL EXAMINATION.—The candidate must, in addition to preparing a thesis, pass an oral or written examination (or both). The examining committee is appointed by The Graduate Dean, on recommendation of the Graduate Studies Committee of the department or area, and when a thesis is written it will normally be the thesis committee. The committee will have one representative from the minor area.

MASTER OF ARTS DEGREE

General Requirements

1. A thesis (six semester hours) plus twenty-four semester hours of course work. There must be a minimum of twenty-one hours, including the thesis, of graduate courses (those numbered 3500 and above). Only nine hours of 3300 and 3400 courses are permitted in a program, and no more than six hours may be included in either major or minor.
2. A major with a minimum of eighteen semester hours including the thesis. Major fields for the Master of Arts include Drama and Speech (including speech pathology and audiology), Economics, Education, English, History, Political Science, Psychology, Sociology and Spanish.
3. A minor of from six to twelve hours in a related field may be accepted or required by the department. A transfer student must complete at least three hours of the minor in residence.

Thesis Requirements for the Master of Arts Degree

The thesis must be approved by a committee of not less than three. Two completed and bound copies of the thesis, neatly typed on quality bond paper in uniform large type, double-spaced, must be presented to the Dean of the Graduate School not less than ten days before commencement day in the long session, and not less than five days before the end of the summer session. In order to obtain the six semester hours credit for the thesis, the student must register for course 3598 when he begins work on his thesis. Thereafter he must register for course 3599 each semester or term during which he is working on his thesis.

If a student has not completed his thesis work at the end of two years after the subject has been approved and recorded, the supervisor may require him to choose another subject. Credit in the thesis course will not be granted until the thesis is completed and approved.

MASTER OF EDUCATION DEGREE

General requirements for all programs:

1. Thirty-six semester hours of course work.
2. There must be a minimum of twenty-seven hours of graduate courses (those listed 3500 and above). The other courses must be numbered 3400 or above as listed in the Bulletin of the Graduate School.
3. A transfer student must complete at least three semester hours of the minor in residence.

Credit limitations for full-time teachers:

Students who are employed in full-time teaching positions will be limited to three semester hours of work each semester. With the written consent of the school superintendent, a student may take six semester hours of graduate credit for one semester a year.

TEACHER CERTIFICATION:

If a student wishes to work toward a graduate degree and at the same time meet

the requirements for an initial teacher's certificate, he should consult with the Dean or Assistant Dean of the School of Education in addition to the departmental graduate adviser.

Approved programs:

The following graduate programs have been approved by the Texas Education Agency and the State Board of Education for the Professional Certificate:

CURRICULUM AND INSTRUCTION:

- Elementary Teaching
- Secondary Teaching

EDUCATIONAL ADMINISTRATION:

- School Administration
- Educational Supervisor in Elementary School
- Educational Supervisor in Secondary School

EDUCATIONAL PSYCHOLOGY AND GUIDANCE:

- Counseling and Guidance
- Educational Diagnostian

CURRICULUM AND INSTRUCTION

P R O G R A M S

DEPARTMENTAL REQUIREMENTS FOR THE MASTER OF EDUCATION DEGREE. — Students who are working toward the Master of Education Degree in Curriculum and Instruction may select one of five plans. At least twelve semester hours must be taken in the Department of Curriculum and Instruction.

ELEMENTARY TEACHING:

1. Requirements for the program in Elementary Teaching for students who wish to qualify for the Professional Certificate.*
 - a. *Specialization Area:* Twelve semester hours of credit in courses numbered 3500 and above in one of the following elementary subjects: Biological Sciences, Chemistry, English, French, Geology, Political Science, Health and Physical Education, History, Music, Physics, Reading, Sociology, and Spanish. At least eighteen semester hours of undergraduate credit are required in the selected elementary subject.
 - b. *Professional Development Area:* Nine semester hours including Educ. P. 3500 and Educ. C. 3501 and either Educ. C. 3513 or Educ. P. 3514.
 - c. *Resource Area:* Six semester hours.
 - d. *Electives:* Nine semester hours approved by the Graduate Adviser of the Department of Curriculum and Instruction, of which at least six must be in Education.
2. Requirements for the program in Elementary Teaching for students who do not wish to qualify for the Professional Certificate.*
 - a. *Specialization Area:* Twelve semester hours of advanced or graduate credit in one of the following subjects: Art, Biological Sciences, Chemistry, Economics, English, French, Geology, Political Science, Health and Physical Education, History, Mathematics, Music, Physics, Reading, Spanish, Speech, and Sociology. At least eighteen semester hours of undergraduate credit are required in the selected elementary subject.
 - b. *Professional Development Area:* Nine semester hours including Educ. P. 3500 and Educ. C. 3501 and either Educ. C. 3513 or Educ. P. 3514.

- c. *Resource Area*: Six semester hours.
- d. *Electives*: Nine semester hours approved by the Graduate Adviser of the Department of Curriculum and Instruction.

SECONDARY TEACHING:

1. Requirements for the program in Secondary Teaching for students who wish to qualify for the Professional Certificate.*
 - a. *Specialization Area*: Twelve semester hours of credit in courses numbered 3500 and above in one of the following secondary subjects: Biological Sciences, Chemistry, English, French, Political Science, Health and Physical Education, History, Music, Physics, and Spanish. At least twenty-four semester hours of undergraduate credit are required in the selected secondary teaching field.
 - b. *Professional Development Area*: Nine semester hours including Educ. P. 3500 and Educ. C. 3501 and either Educ. C. 3511 or Educ. P. 3517.
 - c. *Resource Area*: Six semester hours.
 - d. *Electives*: Twelve semester hours approved by the graduate adviser of the Department of Curriculum and Instruction, of which at least six must be in Education.
2. Requirements for the program in Secondary Teaching for students who do not wish to qualify for the Professional Certificate.*
 - a. *Specialization Area*: Twelve semester hours of advanced or graduate credit in one of the following fields: Art, Biological Sciences, Business Administration, Chemistry, Drama, English, French, Geology, Political Science, Health and Physical Education, History, Mathematics, Music, Physics, Spanish, and Speech. At least twenty-four semester hours of undergraduate credit are required in the selected secondary teaching field.
 - b. *Professional Development Area*: Nine semester hours from Educ. P. 3500, Educ. C. 3511, or Educ. P. 3517 or Educ. P. 3538. The Graduate Dean may in individual cases approve substitutions.
 - c. *Resource Area*: Six semester hours.
 - d. *Electives*: Nine semester hours approved by the Graduate Adviser of the Department of Curriculum and Instruction, of which at least six must be in Education.

SPECIAL PROGRAMS:

Students whose needs are not met by any of the alternatives listed above may plan special programs provided the General Requirements for the degree of Master of Education are met.

*The applicant should hold, or be eligible for, the appropriate provisional certificate before admission into this program.

EDUCATIONAL ADMINISTRATION PROGRAMS

DEPARTMENTAL REQUIREMENTS FOR THE MASTER OF EDUCATION DEGREE. — Students who are working toward the Master of Education Degree in Educational Administration and Supervision may select one of the four plans.

ADMINISTRATION:

Requirements for the program for the Professional School Administration Certificate.

1. Completion of the M.Ed., and professional teaching certificate in elementary or secondary teaching. The professional teacher program must be planned to provide the foundation work for the program in school administration.
2. General and Specialized Professional Administration Areas: Educ. A. 3528, 3532, 3535, 3533, plus twelve hours from Educ. A. 3524, 3502, 3525, 3526, 3529, and 3531.

SUPERVISION:

Requirements for the programs of Elementary Supervision and Secondary Supervision.

1. ELEMENTARY SUPERVISION:

- a. Education courses: Ed. A. 3524, 3528, 3535, 3502; Ed. C. 3513, 3508; Ed. P. 3500, 3514 or 3538, plus six hours of 3500 electives in Education.
- b. Six hours credit from one of the following minors: Art, Biological Sciences, Business Administration, Chemistry, Drama, Speech, Economics, English, French, Geology, Political Science, Health and Physical Education, History, Mathematics, Music, Philosophy, Physics, Psychology, Sociology, Spanish.

2. SECONDARY SUPERVISION:

- a. Education courses: Ed. A. 3524, 3532, 3535, 3502; Ed. C. 3511, 3509; Ed. P. 3500, 3517 or 3538.
- b. Six hours credit from one of the minors listed above under Elementary Supervision, plus six hours of 3500 electives in Education.

SPECIAL PROGRAMS:

Students whose needs are not met by any of the alternatives listed above may plan special programs provided the General Requirements for the degree of Master of Education are met.

EDUCATIONAL PSYCHOLOGY AND GUIDANCE PROGRAMS

DEPARTMENTAL REQUIREMENTS FOR THE MASTER OF EDUCATION DEGREE. — Students who are working toward the Master of Education Degree in Guidance and Counseling may select one of two plans.

General course requirements are: Ed.P. 3500, 3502, 3518, 3519, 3520, 3522, 3535, 3539 plus Ed.P. 3517 or 3538 plus six hours credit from Ed.P. 3516, 3536, 6523 plus six hours credit in a minor listed under elementary education. Ed.P. 3420 must be taken as a deficiency course if not completed at the undergraduate level.

Plan I. This plan may be selected, if the student has concentrated his previous work in education and is working toward a Texas Professional Counselor's Certificate. Course work will include a minimum of 30 semester hours in courses specifically designated in the Department of Educational Psychology and Guidance. A six hour minor is required.

Plan II. This plan may be selected if the student has concentrated his previous work in Psychology and/or Sociology. Other areas may be used with the permission of the department. This plan does not lead to the Professional Counselor's Certificate. Course work will include a minimum of 30 semester hours in courses specifically designated in the Department of Educational Psychology and Guidance. A six hour minor is required.

THE MASTER OF SCIENCE DEGREE

General Requirements.

1. A thesis (six semester hours) plus twenty-four semester hours of course work. (Some departments have plans requiring thirty-six hours without a thesis.) Only nine hours of 3300 or 3400 courses are permitted in a program, and no more than six hours may be included in either major or minor.
2. A major with a minimum of eighteen semester hours including the thesis. Major fields for the Master of Science include Biology, Chemistry, Engineering, Geology, Health and Physical Education, Mathematics, and Physics.
3. A minor of from six to twelve hours in a related field may be accepted or required by the department. A transfer student must complete at least three hours of the minor in residence.

Thesis Requirements

The thesis must be approved by a committee of not less than three. Two completed and bound copies of the thesis, neatly typed on quality bond paper in uniform large type, double spaced, must be presented to the Dean of the Graduate School not less than ten days before commencement day in the long session, and not less than five days before the end of the summer session. In order to obtain six semester hours credit for the thesis, the student must register for course 3598 when he begins work on his thesis and must register for course 3599 each semester or term during which he is working on the thesis.

If the thesis has not been completed at the end of two years after the subject has been approved and recorded, the supervisor may require him to choose another subject. Credit in the thesis course will not be granted until the work has been completed and approved.

(See the Graduate Bulletin for complete details)

Courses Offered . . .

Accounting	94	Japanese	187
Anthropology	215	Kindergarten Education	111
Art	148	Latin	187
Biology	220	Library Services	111
Business	96	Linguistics	174
Chemistry	227	Mass Communication:	
Drama	151	Broadcasting	178
Economics and Finance	103	Journalism	176
Education:		Mathematics	237
Curriculum and Instruction	108	Microbiology	221
Educational Administration and Supervision	116	Military Science	181
Educational Psychology and Guidance	117	Music	191
Health & Physical Education	121	Music Education	193
Engineering:		Nursing	217
Civil	129	Philosophy	199
Electrical	134	Physics	242
Mechanical	139	Plant Sciences	223
Metallurgical	143	Political Science	202
English	159	Portuguese	187
French	184	Psychology	208
Geography	236	Reading	112
Geological Sciences	231	Religion	200
German	185	Russian	187
History	167	Social Work	216
Italian	186	Sociology	212
		Spanish	187
		Speech	151
		Speech Pathology	156
		Zoology	224

☞ *Explanation of Course Numbering System* ☞

CREDIT MEASUREMENT

The unit of measurement for credit purposes is the semester hour. A semester hour entails one hour of recitation and/or lecture (or the equivalent in shop or laboratory work) per week for one semester of sixteen weeks, unless otherwise specified in the course description. Three hours of shop or laboratory work are counted as equivalent to one classroom hour and the preparation for it. Following the title of the course, the first figure in parenthesis indicates the clock hours per week devoted to lecture (including recitation). The second figure in parenthesis indicates the clock hours per week devoted to laboratory, shop, studio, or field work. See example at the bottom of this page.

Values in parenthesis designating dollars are explained under course fees.

COURSE NUMBERING SYSTEM

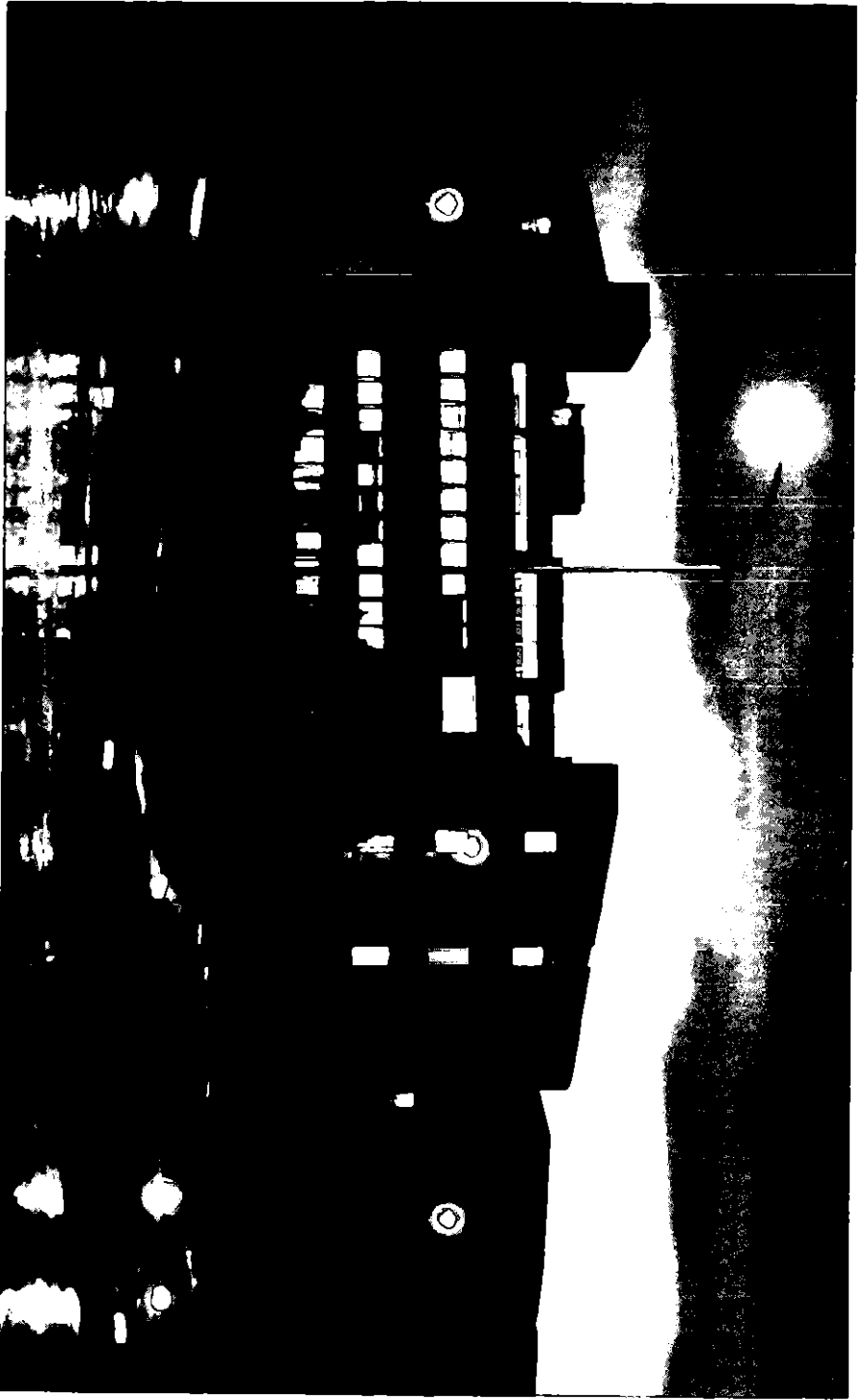
Courses are designated by four digit numbers. The first number indicates semester hour value of the course, the second number indicates level of the course: all courses with a second number of 1 are freshman courses, all courses with a second number of 2 are sophomore courses, all courses with a second number of 3 are junior courses, all courses with a second number of 4 are senior courses, and all courses with a second number of 5 are graduate courses. Any course with a second number of 3 or 4 may be counted as upper division work.

TWO SEMESTER COURSES

Courses requiring two semesters for completion of a specific degree requirement are designated in the course description by a hyphen, for example, Biology 4101-02. Elective credit only will be given until both semesters of the course have been completed. When any course requires two semesters for completion, the first semester is prerequisite for enrolling in the second semester.

COURSE FEES

Applicable laboratory and other special fees for individual courses are listed on pages 263-264.





School of Business Administration

JOHN M. RICHARDS, *Dean*

L. PHILLIPS BLANCHARD, *Assistant Dean*

1



SCHOOL OF BUSINESS ADMINISTRATION

ACCOUNTING

WILFRID F. RYLANDER, *Chairman*

Professors NOURALLAH, PATE;

Associate Professors BOVARD, FLORES, RYLANDER, SANDERS;

Assistant Professors BUCKNER, FLAHERTY, FLYNT.

- B.A. Degree** — Course requirements for the B.A. degree with a Business Administration major (Accounting Option) are as follows: Accounting 3211, 3221, 3321, 3322, 3323, 3327, 3404, and three additional hours of advanced accounting other than 3309.
- 3211 Principles of Financial Accounting (3-1) [Formerly 3101]**
A study of the concepts of Financial Accounting. The course is designed to impart to the student the inputs and outputs that produce financial statements. (Voluntary Lab)
- 3212 Principles of Managerial Accounting (3-1) [Formerly 3102]**
A study of the functional uses of accounting data with emphasis on the use of accounting data by management. For non-accounting majors, Accounting 3212 and 3221 may not both be counted for credit toward an accounting option but one may count as a free elective. *Prerequisite:* Accounting 3211. (Voluntary Lab)
- 3221 Accounting Methods and Procedures (3-1) [Formerly 3200]**
A study of the accounting cycle and its completion, the voucher system, cost accounting, and payroll accounting. For accounting majors, Accounting 3221 and 3212 may not both be counted for credit toward an accounting option but one may count as a free elective. *Prerequisite:* Accounting 3211. (Voluntary Lab)
- 3309 Survey of Accounting Principles, Techniques, and Concepts (3-0)**
A non-technical approach to accounting with emphasis on the use and interpretation of financial statements, cost behavior and analysis of cost accounting reports, budgeting and variances from budgets. (Open only to Non-B.B.A. students).
- 3321 Intermediate Accounting I (3-0) [Formerly 3201]**
An in-depth study of accounting principles, concepts, and alternate accounting methods. A critical review of financial statements with emphasis on the asset accounts and related nominal accounts. *Prerequisite:* Accounting 3221 or 3212.
- 3322 Intermediate Accounting II (3-0) [Formerly 3202]**
A study of current, non-current, and contingent liabilities and owners' equity accounts. Preparation of statement of changes in financial position. *Prerequisite:* Accounting 3321.
- 3311 Income Tax Planning and Control (3-0) [Formerly 3205]**
A study of the basic concepts of federal income tax that are applicable to all taxpayers with emphasis upon planning and control. For non-accounting majors, 3311 and 3327 may not both be counted for credit. *Prerequisite:* Accounting 3212 or 3221.
- 3323 Cost Accounting (3-0) [Formerly 3301]**
A study of cost accounting procedures with emphasis on the basic theory and procedures of allocating materials, labor, and manufacturing expenses in job order and process cost systems. Determination of standard costs, budgetary controls, variance analysis, and cost and profit analysis for management decision making. *Prerequisite:* Accounting 3221 and 3212.
- 3326 Special Problems in Accounting (3-0) [Formerly 3306]**
A study of specialized procedures and unique methods of fund accounting for governmental units and private institutions, of consignment sales, installment sales, estates and trusts, receiverships and statements of affairs. *Prerequisite:* Accounting 3321.

- 3327 Federal Income Tax — Individuals (3-0) [Formerly 3307]**
A comprehensive explanation of the Internal Revenue Code and Regulations as they pertain to individuals. The tax principles are applied to problems and the preparation of the individual tax return. For accounting majors, Accounting 3327 and 3311 may not both be counted for credit. *Prerequisites:* Accounting 3221 or 3212.
- 3328 Federal Income Tax — Partnerships and Corporations (3-0) [Formerly 3308]**
A comprehensive explanation of the Internal Revenue Code and Regulations as they pertain to partnerships and corporations including problems and preparation of tax returns. Analysis of federal gift, estate, and inheritance tax structure. *Prerequisite:* Accounting 3327.
- 3399 Current Concepts in Accounting**
Topic to be announced. This course may be repeated for additional credit as topics are changed. *Prerequisite:* Instructor's permission.

For Undergraduate and Graduate

- 3401 Advanced Accounting (3-0)**
A study of special problems of partnership accounting; of home office and branch accounting; and of corporate mergers, acquisitions, liquidations, reorganizations, and international operations. *Prerequisite:* Accounting 3322.
- 3403 Accounting Systems (3-0) [Formerly 3303]**
Analysis of fundamental accounting systems. Emphasis on systems design; relationship of system and organization; objectives, policies, procedures, and plans. *Prerequisite:* Accounting 3322.
- 3404 Auditing Principles and Procedures (3-0)**
A study of auditing reports, standards and procedures; verification of balance sheet and related nominal accounts in the framework of generally accepted accounting principles. *Prerequisite:* Accounting 3322 and 3323.
- 3497 C.P.A. Problem Review (3-0)**
A study of past C.P.A. examinations and current topics. Cannot be used to satisfy the twenty-seven semester hour requirement for an accounting major. *Prerequisite:* Twenty-one semester hours of accounting or consent of instructor.
- 3498 Studies in Advanced Accounting (3-0)**
A study of fundamental concepts and standards; the relationship between theory and practice; criteria developed for understanding, interpreting, and applying accounting theory. *Prerequisite:* Twelve hours of advanced Business Administration including intermediate accounting.
- 3499 Accounting Theory — Seminar (3-0)**
A study of modern accounting theory, its background, applications, and influencing forces. *Prerequisite:* Twenty-one semester hours of accounting

B U S I N E S S

ALBERT BLUM, *Chairman*

Professors BAYLOR, BLUM, DAWKINS, DILLMAN, GEORGE, HARTRICK, JOYCE, PERES; *Associate Professors* BLANCHARD, FOSTER, STENICKA; *Assistant Professors* FREELAND, GIFFORD, JOHNSON, PALMORE, POPP, TOMPKINS, ZAVALETA; *Instructors* DAWSON, SIPES; *Lecturer* SCOTT.

B.B.A. Degree — See page 62 for degree requirements.

B.A. Degree — Course requirements for the B.A. degree with a Business Administration major (Business Option) are as follows: Accounting 3309, Management 3300, Marketing 3300, Office Management 3308. (Business Communications), Business Law 3301, Statistics 3201, Finance 3310, General Business 3203, six hours of advanced Business electives, and six hours of free Business electives.

GENERAL BUSINESS

3203 Introduction to Computers (3-1)

An introductory course in computers designed to familiarize the student with the impact of the computer on the business and economic society. Emphasis is placed on computer language, programming, and decision-making in the fields of economics and business.

3300 Business Applications of Computers (3-0)

A study of current business applications of computers. A fundamental knowledge of COBOL. *Prerequisite:* General Business 3203 and Statistics 3201, or consent of instructor.

3301 Social Responsibility of Business (3-0)

The student correlates the objectives of business firms with those of the society as a whole, analyzes the interrelationships of business resources, and examines the management process of marshalling and utilizing resources to attain desired objectives.

3304 Insurance Planning (3-0)

Insurance as it applies to the average citizen, with emphasis on general principles, types of policies available, fitting policies to needs, and cost to policyholders.

3310 Introduction to Real Estate (3-0)

Theory of supply and demand for real estate, the housing market structure, the equity and mortgage markets, the development and significance of private and governmental institutions financing real estate and the role of credit in real estate markets. *Prerequisite:* Consent of the instructor.

3320 Principles of Appraising (3-0)

The theory and practice of property evaluation, cost estimation, investment earnings forecasts, principles and technology. *Prerequisite:* Consent of the instructor.

3399 Current Concepts in Business (3-0)

Topic to be announced. This course may be repeated for credit as topics are changed. *Prerequisite:* Consent of instructor.

3401 Comparative Readings (3-0)

An independent study opportunity designed to augment a student's unique ability or to be used as a means of encouraging broadened thought through comparisons of business philosophies. Written reports based upon assigned readings are required.

3405 Seminar on Appraisal and Valuation

A study of the tools and techniques commonly applied in problems of appraisal and valuation; case studies. *Prerequisites:* General Business 3320 or consent of the instructor. (Note: This course description was changed after approval of the course by the general faculty.)

BUSINESS LAW

- 3301 Business Law I (3-0)**
Designed to introduce the student to the legal environment in which business decisions are made.
- 3304 Business Law II (3-0)**
A continuation of Business Law 3301 with emphasis on the Uniform Commercial Code. *Prerequisite:* Business Law 3301.
- 3400 Legal Aspects of the Management Process (3-0)**
The nature of the partnership and corporation and their jurisprudential problems; the rights and powers of managers and the limits of their discretion; and the manager's duties and responsibilities to his organization, to investors, to creditors, to the state, and to the general public.
- 3401 C.P.A. — Law Review (3-0)**
A review of the legal subjects covered in the examination for Certified Public Accountants. *Prerequisite:* Business Law 3304 or permission of the instructor.

MARKETING

- 3300 Principles of Marketing (3-0)**
A description and analysis of the ways in which goods move to points of consumption. Topics studied include functions, institutions, the marketing environment, markets, and government regulation.
- 3302 Principles of Retailing (3-0)**
Analysis of retail store management including personal requirements and career opportunities with emphasis on modern methods in buying, receiving, pricing, merchandise and financial control, sales promotion and customer service. *Prerequisite:* Marketing 3300.
- 3303 Promotion Strategies (3-0)**
Introduction to fundamental economics and social aspects of promotion. Emphasis is given on media, budgeting, evaluation, regarding advertising and sales promotion strategy. *Prerequisite:* Marketing 3300.
- 3304 Distribution Logistics (3-0)**
Provides a functional knowledge of transportation and distribution systems capable of introducing change or reacting to change in the economic system. Emphasis upon the functional analysis of carriers, distribution system alternatives, spatial arrangements of markets, and selection of physical movement channels in accordance with emerging regional and national programs. *Prerequisite:* Marketing 3300.
- 3305 International Marketing (3-0)**
Emphasis is given international marketing from the viewpoint of the marketing manager who must recognize differences in market arrangements, and in legal, cultural, and economic factors in different countries. Areas covered include planning and organizing for international operations, interrelationships with other functions, product strategy, pricing promotion, channels and financial aspects of international marketing. *Prerequisite:* Marketing 3300.
- 3307 Professional Salesmanship (3-0)**
Analysis of the concepts and personal attributes required for professional selling; preparation, modern methods of sales presentation, building of good-will; employer, employee, and competitor relationships. *Prerequisite:* Junior standing or approval of the department Chairman.
- 3308 Consumer Behavior (3-0)**
Analysis of psychological, sociological, and cultural aspects of human behavior that affect consumers' actions in the market place. Provides an understanding to facilitate marketing planning and strategy in reference to promotion, channels of distribution, product development, and pricing. *Prerequisite:* Marketing 3300.

3309 Marketing Channel Structures (3-0)

An examination of the decision variables confronting the management of vertical marketing channel structures which link production and consumption. Emphasis will be placed on application of behavioral and analytical techniques which aid decision making in an interorganizational context. *Prerequisite:* Marketing 3300.

3401 Marketing Research and Analysis (3-0)

Scientific methods of analysis and statistical techniques are employed in solving marketing problems. Emphasis on collection of information from internal and external sources; analysis; interpretation, and presentation of research findings. *Prerequisite:* Statistics 3201 and Marketing 3300.

3406 Sales Management (3-0)

The selection and administration of the sales force; determination of marketing policies; and the planning, coordination, and control of all promotional activities. *Prerequisite:* Marketing 3300.

3409 Marketing Management (3-0)

An integrating course in Marketing, systemically oriented with emphasis on the marketing mix, and special attention to market analysis, marketing information, and sales forecasting. *Prerequisite:* Marketing 3300, and 9 additional hours of marketing courses.

For Undergraduates and Graduates

Prerequisite for courses listed below: Senior or Graduate standing.

3498 Marketing Survey and Analysis (3-0)

A comprehensive approach embracing all business activities involved in moving goods from production to consumption. Breadth and depth are pursued with analytical emphasis upon marketing institutions, functions, regulations costs, efficiency, and contemporary marketing problems. Developing a philosophy of the role of marketing in the American economy is also emphasized.

3499 Marketing Theory — Seminar (3-0)

Concepts and theories advanced in the development of marketing institutions, channels, functions and marketing processes. Emphasis is given other disciplines and their contributions to marketing thought.

OFFICE MANAGEMENT AND BUSINESS EDUCATION

3101 Typewriting I (3-2)

Fundamentals of touch typewriting; mastery of keyboard and techniques; development of speed and accuracy; page arrangement of business letters, tabulation, and manuscript writing.

3102 Typewriting II (3-2)

Advanced instruction in applied typewriting with emphasis on increased speed, accuracy, and efficiency to meet business production standards; legal work and business forms. *Prerequisite:* Office Management 3101, or equivalent.

3103 Shorthand I (3-2)

Principles of Gregg shorthand; reading, writing, and elementary transcription. *Prerequisite:* Office Management 3101 or equivalent.

3104 Shorthand II (3-2)

Gregg shorthand continued; skill and speed building; dictation and transcription of unpracticed material. *Prerequisite:* Office Management 3101 or equivalent.

3301 Transcription (3-2)

Transcription of mailable business correspondence, vocabulary building, sustained dictation and transcription practice. *Prerequisite:* Office Management 3104 or equivalent.

3302 Office Problems and Procedures (3-2)

Processing of mail, filing and records management, procuring office supplies, receiving calls and callers, handling travel arrangements, preparing business reports, developing business reports, developing personal and professional qualities. *Prerequisite:* Office Management 3101 or equivalent.

- 3303 Office Management (3-0)**
A study of the authority and responsibilities of the office manager. Comprehensive applications of modern management concepts and practices in the organization, operation, and control of office functions.
- 3304 Business Systems (3-0)**
Methods of establishing, analyzing, standardizing, and controlling administrative systems and procedures including: work simplification, forms analysis, work-flow charting, layout and space analysis, office manuals.
- 3305 Administrative Services I (3-2)**
Theory and practice in the selection and operation of dictation and transcription machines, duplicating and copying machines, calculators, proportional spacing and automatic typewriters. *Prerequisite:* Office Management 3101 or equivalent.
- 3306 Administrative Services II (3-2)**
Theory and practice in the selection and operation of rotary and key-driven calculators, adding-listing machines, and desk computers. Applied business mathematics; solving business problems with calculators.
- 3307 Office Internship (3-0)**
Office work experience with business or industrial firms. Two-hour seminar per week during internship. *Prerequisite:* typewriting skill, 65 words per minute; shorthand dictation skill, 100 words per minute; permission of Director.
- 3308 Business Communications (3-0)**
Development of clear, persuasive writing skill through intensive application of communication principles. Classroom discussion is supplemented by supervised practice in the composition of business letters, reports, memos, and other written communications.

For Undergraduates and Graduates

- 3497 Business Report Writing (3-0)**
Organization and preparation of reports of the types used in business. Techniques of collecting, interpreting, and presenting information useful to management.
- 3498 Improving Instruction in Secretarial Subjects (3-0)**
Modern methodology in teaching typewriting, shorthand, and office practice courses. The psychology of skill building and techniques of office production.
- 3499 Business Education — Seminar (3-0)**
Evaluation of methodology and materials used in teaching business subjects. The place of business education in general education.
- 1450 to 6450 Business Education Workshop (Hours vary)**
Area of study will be designated.

MANAGEMENT

- 3300 Introduction to Management (3-0)**
An introduction to the basic elements and theory of management including an examination of alternative managerial tools and the complex of internal and external forces impacting on managerial decisions.
- 3310 Introduction to Organization Behavior (3-0)**
This course is designed to develop for the student a useful frame of reference for approaching human problems in the world of work. Topics include awareness of individual behavior, two-person interaction, the dynamics of group and inter-group behavior, and the effects of the total system on behavior observed within the organization. *Prerequisite:* Management 3300.
- 3311 Industrial Relations (3-0)**
Provides the student with a survey of policy, procedures, and current practices in the area of the personnel subsystem. Exposure is provided to current concepts dealing with selection, utilization, and retention of employees. Topics to be covered are employment, manpower development, managerial selection, compensation, and labor relations. *Prerequisite:* Management 3300.

- 3312 Behavioral Decisions in Organizations (3-0)**
Develops a greater understanding of human behavior in organizations directly relating to managerial decision making and developing greater skill in decision making in human problem situations. *Prerequisite:* Management 3310.
- 3313 Applied Management Techniques (3-0)**
Provides the opportunity to put into practice the concepts explored in earlier courses. Through the case study method, insights will be gained into the challenges which management faces. The case studies help to show the interdisciplinary nature of management activity. *Prerequisite:* Management 3311.
- 3315 Collective Bargaining (3-0)**
Analysis of bargaining procedures; study of basic institutional issues in bargaining, economic related administrative clauses, strike and lockout tactics, contract administration. Preparation, negotiation, and interpretation of labor contracts. *Prerequisite:* Management 3311.
- 3321 Production Management — Fundamental (3-0)**
Study of basic quantitative procedures and techniques employed in operations management with emphasis on the development and understanding of analytical techniques and their contribution to managerial decision-making. Statistical, linear programming, and general quantitative analysis applied in case problems.
- 3322 Production Management — Advanced (3-0)**
An analytical approach to the management of physical resources. Study of new developments in mathematical and statistical bases for making rational decisions in operating management, linear programming, value analysis, problem-solving models. Production system simulation by computer. *Prerequisite:* Management 3321 and Statistics 3201.
- 3324 Operations Research — Managerial (3-1)**
The objective of this course is to provide an understanding of the philosophy of operations research, to introduce the mathematical techniques employed in the solution of typical management problems, and to teach the student when and where the operations research methodology can be applied. Mathematical programming, game theory, queuing theory, and Monte Carlo simulation applied to problem situations. Computer programmed problem-solving. *Prerequisite:* Statistics 3201.
- 3331 Methods Analysis (3-0)**
Methods improvement procedures, process analysis, principles of motion economy. Determination of time standards and their relation to incentive systems. Emphasis on human relations problems. Development and control of performance standards. *Prerequisite:* Management 3321.
- 3333 Production Control (3-0)**
The control of time, quantity, and quality of operations. Routing, scheduling, dispatching, and control problems. System relationships in manufacturing, sales, and technical staff departments. *Prerequisite:* Management 3321.
- 3336 Purchasing, Stores and Inventory Control (3-0)**
Objectives, principles, and methods in managing the function of material supply in industry. Special attention to problems met in planning materials, requirements, purchasing, receiving, storing and disbursing. *Prerequisite:* Management 3321.
- 3400 Business Policy and Management Laboratory**
Integration of accounting, business law, finance, personnel and production management, and marketing background in the solution of top-management problems. Computer simulated business operation and administration. Student placement with cooperating firms to receive on-the-job training in Management. *Prerequisite:* Senior standing.

For Undergraduates and Graduates

- 3412 Management of Human Resources (3-0)**
Manpower management viewed in terms of overall organizational performance. Constructive personnel techniques studied as implementation of modern management theory. Behavioral concepts applied to the broad problems, changing emphasis, and specific issues of managing human resources in the autonomous firm in a free society. *Prerequisite:* Management 3312.

- 3415 Industrial Relations Research — Seminar (3-0)**
Applications of the scientific method to contemporary and potential problems in manpower management, including procedures for establishment of standards and for evaluation of existing programs. *Prerequisite:* Management 3313.
- 3422 Operations Planning and Control (3-0)**
An analytical study of modern concepts and techniques which have been developed to plan and control operations effectively. Analysis by quantitative techniques for managerial planning and decision-making. Computer applications in problem-solving and simulation. The objective of the course is to bring the range of concepts and techniques to a point of effective application. *Prerequisite:* Management 3321 and three hours of advanced Management.
- 3424 Production Management — Seminar (3-0)**
Current development in production engineering and management. Attention will be given to the identification, definition, and analysis of problem areas. Research of literature and investigation of modern methods. *Designed to develop facility in analyzing management problems in manufacturing. Prerequisite:* Management 3321 and three hours of advanced Management.

STATISTICS AND QUANTITATIVE ANALYSIS

- 3201 Fundamentals of Statistics (3-1)**
Introduction to the foundations of descriptive statistics. Measures of location and variation, with emphasis on specific applications. Study of Index numbers. Introduction to foundations of probability. *Time series, Correlation analysis.* The course will cover also an introduction to electronic data programming with application emphasis to the related statistical problems studied. *Prerequisite:* Mathematics 3120 or equivalent. (Voluntary Lab).
- 3301 Intermediate Statistics (3-1)**
Probability and combinatorial analysis. Decision theory, mathematical expectations, tests of hypothesis, linear regression and analysis, correlation analysis, multiple linear regression. Time series and trend analysis, seasonal and cyclical movements. Probability distributions, sampling distribution, the "t" distribution, the binomial distribution, the Poisson distribution, chi-square distribution. *Introduction to operations research and linear programming. Prerequisite:* Statistics 3201. (Voluntary Lab).
- 3302 Operations Analysis (3-0)**
Introduction to philosophy, techniques, and business applications of modern mathematical sciences with emphasis on the managerial viewpoint. Foundations of mathematical operations for programming; analysis methods; price analysis and its determination; study of market elasticities with applications. *Prerequisite:* Statistics 3301.
- 3310 Decision Theory (3-0)**
The use of finite mathematical techniques in administrative decision-making. *Prerequisite:* Statistics 3201, and three hours of Economics, or consent of instructor.
- 3401 Business Forecasting and Time Series (3-0)**
Introduction to the contemporary theory of economic fluctuations, economic indicators; foundations of business forecasting; analysis of business indexes in current use. Business index number construction, methods of measuring business trends and fluctuations, with applications to business forecasting. Serial and multiple correlation and business trends. Advanced study of time series. Application of forecasting methods to specific case studies. Role of business forecasting in managerial planning, principles and methods of forecasting and evaluation of the reliability of existing forecasting techniques. Short term and long term forecasting of industry, regional and national business trends. *Prerequisite:* Statistics 3301.

For Undergraduates and Graduates

3498 Statistical Survey Techniques (3-0)

Building of econometric models and advanced time series analysis in measuring trends and fluctuations in business and economics; mathematical programming and the analysis of business series; input-output analysis. Analysis of inter-industry relationships.

3499 Regional Analysis, Methods and Principles — Seminar (3-0)

Quantitative and mathematical approach to the analysis of regional economies; construction of regional economic models; and methods of regional analysis. Some case studies and class projects for the El Paso area.

ECONOMICS & FINANCE

PAUL D. ZOOK, *Chairman*

Professors FENLON, HOOKER, RICHARDS, ZOOK; *Associate Professors* BRAND, DURIEZ, JAMES; *Assistant Professors* FLOYD, NEILL, ROTH, TARWATER, TOLLEN.

ECONOMICS

B.A. Degree — Specific requirements for the economics major are: Economics 3203, 3204, 3302, 3303, 3320, twelve additional hours of economics, Mathematics 3120, 3201; and a statistics course offered by either the School of Business or the Department of Mathematics.

For Undergraduates

General prerequisite: Junior standing for all 3300 or 3400 level courses.

- 3202 Economics of Poverty (3-0)**
Concept and measurement of poverty; analysis of both the economic causes and economic effects of poverty; policy implications and remedies.
- 3203 Principles of Economics (3-0)**
A survey of the basic principles of economics designed to give a broad understanding of the economy; primary attention is given to aggregate problems and issues considered of particular importance to the nation.
- 3204 Principles of Economics (3-0)**
A continuation of basic economic principles designed to provide an analytical understanding of markets, prices and production.
- 3302 National Income Analysis (3-0)**
A study of national income accounting and theory; emphasis is placed on the classification and analysis of conventional spending sectors and their effect on income and employment; a critical survey of policy applications that affect the level of income and employment. *Prerequisite:* Economics 3203.
- 3303 Intermediate Economic Analysis (3-0)**
A study of cost, demand, and price theory; the concepts, assumptions, and policy implications of aspects of particular equilibrium and general equilibrium theory; a critical survey of various concepts of the scope, methods, and approaches to economics. *Prerequisite:* Economics 3204.
- 3320 Money and Banking (3-0)**
A description of the history and present characteristics of the money and banking structure of the United States. Special emphasis is placed on monetary policy as it affects the level of economic activity. *Prerequisite:* Economics 3204. Economics 3320 and Finance 3320 may not both be counted for credit.
- 3490 Senior Seminar (3-0)**
Concentrated study of selected current economic problems. Emphasis is given to concerted student participation, using proper research techniques and stressing preparation of scholarly presentations. *Prerequisite:* Economics 3204 and consent of instructor and Department Chairman.

For Undergraduates and Graduates

- 3301 Economic History of the United States (3-0)**
Survey of American economic development from colonial time to present; analyses of factors which have shaped that development.
- 3305 Business Cycles and Forecasting (3-0)**
History and description of the phases of the cycle, leading theories of economic fluctuations; prediction of industrial production, prices and profits; methods of alleviation and public policy. *Prerequisite:* Economics 3204.

School of Business Administration

- 3330 Public Finance (3-0)**
Financial administration by agencies of local, state, and federal government; principles of taxation; sales, property, income, and inheritance taxes; analysis of government expenditures and public credit.
- 3334 Regional Economics (3-0)**
Location theory, factors influencing regional growth, and techniques of analysis. Description of economic regions and analyses of interactions among economic regions.
- 3335 Urban Economics (3-0)**
Investigation of economic forces in American urban and metropolitan areas. Topics examined include labor market analysis, the local public economy, urban economic growth, location theory, and land use analysis.
- 3340 Economics of Labor (3-0)**
A study of the basic principles, historical background and characteristics of labor markets; theories of wages, wage structures, collective bargaining and the role of government in labor problems.
- 3351 Government and the Economy (3-0)**
A study of the impact of government policy on the economy, emphasizing effects of governmental regulation on manufacturing and service industries, public utilities, and other segments of the economy.
- 3352 Economics of Transportation (3-0)**
Theory of rate making; rate levels and economic characteristics of railroad, motor vehicle and air transportation. Analysis of government regulation and public policy.
- 3365 International Economics (3-0)**
Principal theories of international trade; foreign exchange markets, international capital flows, barriers to trade, international economic institutions, and the economics of regional trade integration.
- 3366 Economics of Latin America (3-0)**
Considers economic theory and current problems of monetary and fiscal policy, regional economic integration, land reform, export patterns, and industrialization. The emphasis is institutional rather than analytical.
- 3367 Economic Development (3-0)**
A course concerned with problems of economic growth in the less developed countries. Consideration is given to patterns and problems of human and material resource utilization, capital formation, investment criteria, inflation, and the development of innovative techniques. Emphasis is placed on the application of analytical concepts to the problems of economic development.
- 3368 Economy of Mexico (3-0)**
A survey of the growth and change of the Mexican economy. Emphasis is placed on the description and analysis of recent and current economic policy.
- 3372 Mathematical Economics (3-0)**
Basic concepts and operations of mathematical logic and their application to economic analysis. *Prerequisite:* Economics 3204.
- 3373 Introduction to Econometrics (3-0)**
An introductory course designed to acquaint the student with the basic concepts in model building, different types of economic models, problems in techniques of quantifying models, and the use of such models for public and business policy. *Prerequisite:* Economics 3204.
- 3375 Quantitative Methods (3-0)**
Basic concepts of logic, sets, probability, matrix algebra, game theory, and linear programming for applications to problems in business and economics. *Prerequisite:* Economics 3204.
- 3380 History of Economic Thought (3-0)**
A study of the development of principal economic doctrines and schools of economic thought.

- 3385 Contemporary Economic Thought (3-0)**
The development of economic analysis over the past three decades. Emphasis is given to the application of economic theory to the mixed capitalism of *modern Western economies*.
- 3390 Comparative Economic Systems (3-0)**
Economic foundations of the capitalistic and other systems: economic attributes of fascism, *socialism*, *communism*, and capitalism.
- 3395 The Soviet Economy (3-0)**
Analysis of the structure of the Soviet Economy including a *survey of economic development since the revolution*.
- 3399 Current Concepts in Economics (3-0)**
Topic to be announced. This course may be repeated for *additional credit* as topics are changed. *Prerequisite*: Instructor's permission.
- 3420 Monetary and Fiscal Policy (3-0)**
An analysis and critique of *monetary and fiscal policies and practices* designed to facilitate economic stability and economic progress. *Prerequisite*: Economics 3320 or Finance 3320. Economics 3420 and Finance 3420 may not both be counted for credit.
- 3441 Wage Determination (3-0)**
A study of collective bargaining, the *theoretical aspects* of wages and wage determination, and the relationship between wages, production, distribution, and employment. *Prerequisite*: Economics 3204.
- 3480 Managerial Economics (3-0)**
The application of economic concepts and techniques to business problems. Emphasis on decision-making *under uncertainty* with consideration given to production, investment, pricing, research and development, and logistics problems. *Prerequisite*: Economics 3204 or consent of the department chairman.
- 2495-6495 Selected Problems in Economics**
Special studies in areas for which a separate course is not organized. Supervised individual reading and research; *writing of a substantial paper* in the area chosen for study. Credit will vary according to the work performed, value being indicated by course numbers. *Prerequisite*: Consent of instructor and Department Chairman. May be repeated for credit.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Economics and a bachelor's degree.

- 3501 Research Methodology**
- 3502 Microeconomic Theory**
- 3503 Macroeconomic Theory**
- 3510 Economic History**
- 3520 Monetary and Fiscal Policies and Problems**
- 3540 Labor Economics**
- 3550 Social Control of Business**
- 3560 International Economics**
- 3565 Economic Development**
- 3566 Latin American Economics**
- 3570 Advanced Quantitative Methods in Economics**
- 3580 Development of Economic Thought**
- 3595 Seminar in Applied Economic Research**
- 3598-99 Thesis**

FINANCE

B.A. Degree — Specific requirements for the finance major are: Economics 3203 and 3204; Finance 3310, 3315, 3320, fifteen additional hours of finance and Mathematics 3120, 3201.

For Undergraduates

3310 Business Finance (3-0)

Sources and applications of funds by corporations. Management and financing of current assets; the sources and uses of short, intermediate, and long-term funds. Study of capital budgeting, capital structure, dividend policy, and the problems peculiar to financing new business ventures.

3320 Money and Banking (3-0)

A description of the history and present characteristics of the money and banking structure of the United States. Special emphasis is placed on monetary policy as it affects the level of economic activity. *Prerequisite:* Economics 3204. Finance 3320 and Economics 3320 may not both be counted for credit.

For Undergraduates and Graduates

3315 Investments (3-0)

Introduction to the analysis of investment media, means of purchasing and selling securities, and personal investment decision-making. Emphasis is given to determinants of growth, safety, and income and to problems involved in achieving objectives.

3325 Money and Capital Markets (3-0)

Analyses of the instruments and institutions of the money and capital markets, with emphasis on the roles of these markets in the economy. *Prerequisite:* Economics 3320 or Finance 3320.

3410 Managerial Finance (3-0)

The development and utilization of financial plans, policies and practices in business enterprises. Particular emphasis is given to illustrative problems and cases. *Prerequisite:* Finance 3310.

3415 Investment Management and Security Markets (3-0)

A study of investment management policies for individuals and institutions and the operation of organized security exchanges and the over-the-counter market. *Prerequisite:* Finance 3315.

3420 Monetary and Fiscal Policy (3-0)

An analysis and critique of monetary and fiscal policies and practices designed to facilitate economic stability and economic progress. *Prerequisite:* Finance 3320 or Economics 3320. Finance 3420 and Economics 3420 may not both be counted for credit.

3425 International Finance (3-0)

A study of international monetary problems, financing of the flow of goods and services among nations, and balance of payments considerations. *Prerequisite:* Economics 3320 or Finance 3320.

3428 Central Banking (3-0)

A study of the history, economic functions, operating techniques, and policies of central banks. Emphasis is given to concurrent problems of monetary policy and control. *Prerequisite:* Economics 3320 or Finance 3320.

2495-6495 Selected Problems in Finance

Special studies in areas for which a separate course is not organized. Supervised individual reading and research; writing of a substantial paper in the area chosen for study. Credit will vary according to the work performed, value being indicated by course numbers. *Prerequisite:* Consent of instructor and Department Chairman. May be repeated for credit.

3496 Senior Seminar (3-0)

Concentrated study of selected concepts and problems. Emphasis is given to concerted student participation in using research techniques and preparing scholarly presentations. *Prerequisite:* Finance 3310 and consent of instructor and Department chairman.



School of Education

CYRUS MAYSHARK, *Dean*

J. PAUL SCARBROUGH, *Director of Field Experiences*

HILMAR WAGNER, *Certification Officer*



SCHOOL OF EDUCATION

CURRICULUM AND INSTRUCTION

NORMA G. HERNANDEZ, *Chairman*

Professors BURMEISTER, BURNS;

Associate Professors C. GARCIA, EDWARDS, EKWALL, KIES, LICHTENBERGER,
NATALICIO, SCARBROUGH, WAGNER;

Assistant Professors AHO, BACON, BALL, BOLEY, V. DAVIS, HERNANDEZ, KLINGSTEDT,
LOWRANCE, MILSON, SCRUGGS, SELIG, WILLIAMS;

Instructors BARKER, M. GARCIA, GRUBB, MUNN, RICE, STEVENS;

Lecturers FLORES, LAWRENCE.

ELEMENTARY EDUCATION

General Prerequisite for 3300 and 3400 courses: Junior standing
(completion of 60 semester hours)

For Undergraduate Credit Only

- 3302 The Curriculum and Modern Media in the Elementary School (3-0)**
An introduction to the curriculum in the elementary school; consideration of the function of modern media in curriculum development and application.
- 3303 Social Studies in the Elementary School (3-0)**
Content, materials, and methods of teaching social studies in the elementary school. *Prerequisite:* Ed. P.&G. 3301.
- 3304 Science in the Elementary School (3-0)**
The content and strategies for teaching the recently developed elementary science curriculum programs will be emphasized. Research in the area of science in the elementary school and implications for teaching will be the focus of the course. *Prerequisite:* Ed. P.&G. 3301.
- 3305 Children's Literature in the Elementary School (3-0)**
Children's literature and the administration of the recreational reading program in relation to the content subjects in the elementary school. Special reading may be done at the level in which the student is most interested. *Prerequisite:* P.&G. 3301.
- 3306 Language Arts Materials and Methods in the Elementary School (3-0)**
Materials and methods of teaching language arts in the elementary school. *Prerequisite:* Ed. P.&G. 3301 and Ed. C. 3302.
- 3307 Social Foundations of Elementary Education (3-0)**
Structure and functioning of society as a background for the study and evaluation of elementary education; the contribution of sociological principles and findings to the improvement of educational practices.
- 3309 Instructional Problems in Elementary Education (3-0)**
An analysis of the types of curricular patterns, principles of curriculum development, evolving trends, and teaching methods in each of the major curricular areas found in the modern elementary school. Special attention is given to materials and procedures in the language arts area. *Prerequisite:* Six semester hours of advanced credit in elementary education.
- 3405 Methods for Elementary School Mathematics**
Content, materials and methods of teaching mathematics in the elementary school.
- 3407 Classroom Management in the Elementary School (3-0)**
The use of records and group techniques to improve human relations in the classroom.

3496 Professional Laboratory Experience in the Elementary School (1.5-10)

A minimum of 120 clock hours of laboratory observation and teaching in an elementary school classroom, and a minimum of one and one-half hours per week in on-campus seminar.

Prerequisites: a grade point average of at least 2.0 in English 3101-02 and in Speech 3101, 3103, 3104, and recommendations from three university instructors, including one from the Teaching Subject and one from the School of Education, permission of the Director of Field Experiences, and:

1. for elementary education students: a grade point average of at least 2.5 in Ed. P.&C. 3301, Ed. C. 3302, 3306, and in nine semester hours from Ed. C. 3303, 3304, 3305, 3404, and 3405, and a grade point average of at least 2.5 in at least three-fourths of the selected teaching subject. To be taken concurrently with Ed. C. 3497.
2. for elementary-kindergarten students: prerequisites as for elementary education students (above). To be taken concurrently with Ed. C. 3491.
3. for elementary education students who desire to include experiences in a special education classroom as part of their student teaching, prerequisites as in (1) above, and a grade point average of at least 2.5 in Ed. P.&C. 3409, 3421, and 3422. To be taken concurrently with Ed. C. 3497.
4. for all-levels Art students: a grade point average of at least 2.5 in Ed. P.&G. 3301, Ed. C. 3302, Art Ed. 3311, and in at least thirty-three additional semester hours of Art and Art Education, as specified in the University Bulletin. To be taken concurrently with Ed. C. 3498.
5. for Speech and Hearing Therapy students: a grade point average of at least 2.5 in Ed. P.&G. 3409 and twelve additional advanced hours of Education, and in at least three-fourths of the specialization area as specified in Plan II, Department of Drama and Speech section of the University Bulletin, and at least 50 hours of clinical practice in the University clinic. To be taken concurrently with Ed. C. 3498.

The maximum University course load is student teaching (six semester hours), plus two other courses for a total load of not more than thirteen semester hours. It is recommended that a student who has part-time employment reduce his academic load by three semester hours for each ten hours per week he works.

3497 Professional Laboratory Experience in the Elementary School (1.5-10)

A minimum of 120 clock hours of laboratory observation and teaching experience in an elementary school classroom, and a minimum of one and one-half hours per week in on-campus seminar. To be taken concurrently with Ed. C. 3496 by Elementary and Elementary-Special Education students.

SECONDARY EDUCATION**3311 Introduction to the Secondary Curriculum (3-0)**

An introduction to the development of the curriculum in the secondary school.

3312 Methodology and Technological Applications for Secondary Education (3-0)

Consideration of instructional techniques with emphasis on team teaching, laboratory methods, programming, and test development with applications from recent research. *Prerequisite:* Ed. P.&G. 3310.

3313 Social Foundations of Secondary Education (3-0)

Structure and functioning of society as a background for the study and evaluation of secondary education; the contribution of sociological principles and findings to the improvement of educational practices.

3315 Instructional Problems in Secondary Education (3-0)

Methods and materials used in secondary teaching; particular emphasis on analysis and development of courses of study and their use in secondary education. *Prerequisite:* Six semester hours of advanced credit in secondary education.

3418 Current Events in Relation to Classroom Use in the Secondary School (3-0)

Particular attention given to selection, organization, and use of current event materials in the secondary school classroom.

School of Education

3467 Teaching Secondary School Mathematics (3-0)

Secondary school mathematics will be surveyed and the latest curriculum programs will be examined. Skills in analysis and discovery, inquiry and deductive teaching will be emphasized.

3468 Teaching Secondary School Science (3-0)

The materials and methods used in teaching natural and physical science in the secondary school will be examined. Emphasis will be placed on developing skills in the use of inquiry, process approach, and discovery in teaching science.

3498 Professional Laboratory Experiences in the Secondary School (1.5-10)

A minimum of 120 clock hours of laboratory observation and teaching experience in a secondary school classroom, and a minimum of one and one-half hours per week in on-campus seminar.

Prerequisites: A grade point average of at least 2.0 in English 3101-02 and in Speech 3101 or 3103 or 3104; recommendations from three University instructors, including one from a teaching field and one from the School of Education; permission of the Director of Field Experiences and:

1. for secondary education students: a grade point average of at least 2.5 in Ed. P.&G. 3310, Ed. C. 3312, and in at least three-fourths of each teaching field. To be taken concurrently with Ed. C. 3499.
2. for all-levels Art students: a grade point average of at least 2.5 in Ed. P.&G. 3310, Ed. C. 3311, Art Ed. 3312, and in at least thirty-three additional semester hours of Art and Art Education as specified in the University Bulletin. To be taken concurrently with Ed. C. 3496.
3. For Speech and Hearing Therapy students: Prerequisites as for Ed. C. 3496. To be taken concurrently with Ed. C. 3496.

The maximum University course load is student teaching (six semester hours) plus two other courses for a total load of not more than thirteen semester hours. It is recommended that a student who has part-time employment reduce his academic load by three semester hours for each ten hours per week he works.

3499 Professional Laboratory Experience in the Secondary School (1.5-10)

A minimum of 120 clock hours of laboratory observation and teaching experience in a secondary school classroom and a minimum of one and one-half hours per week in on-campus seminars. To be taken concurrently with Ed. C. 3498 by Secondary Education students.

GENERAL (Elementary or Secondary Education)

3101 Introduction to Education (3-0)

The relationship of American public schools to social and economic changes, also problems in the development of the curriculum, instructional practices, school organization, and administration. Open to all students.

3316 Selection, Evaluation and Utilization of Instructional Media and Materials (3-0)

Provide students with a knowledge of media and materials of instruction; principles of effective instructional uses of a variety of media; experiences in the selection and evaluation of specific media; identification of evaluative criteria for materials with reference to learning goals.

3333 Education and the Mexican American (3-0)

Analysis of the achievement and behavior of the Mexican American in school, to include examination of curricular and organizational approaches designed to overcome group disadvantages.

3412 Classroom Integration of Instructional Equipment and Materials (3-0)

Provide a knowledge of instructional equipment and related materials; implement the "systems approach to instruction" contributions of the audio-visual/instructional technology field to classroom instruction.

3413 Educational Television and Radio: Preparation and Presentation of In-School Programs (3-0)

A survey course at the elementary and secondary level in the public school applications of television, including techniques of teaching by closed circuit TV. Production of in-school radio programs for presentation on commercial and educational stations.

- 3414 Preparation of Inexpensive Instructional Media (3-0)**
 Experience and practice in the preparation of materials and media for visualizing instruction; and ability to adapt from mass media prepared materials; mastery of visual reproduction and duplication techniques using specialized equipment; ability to prepare recorded audio materials. Students will secure designated materials required in the course.
- 3437 History and Philosophy of Education (3-0)**
 A survey of educational ideas and practices in the history of western civilization.
- 1450 to 6450 Educational Workshop**
 (Area of study will be designated)
- 1455 to 6455 Workshop in the Teaching of English**
 (Same as English 1455 to 6455.) May be repeated for credit by studying a new topic.

Kindergarten Education

- 3451 Curriculum of Early Childhood Education**
 A survey of learning experiences and activities suitable and effective for young children. Objectives, development, implementation, and evaluation of the curriculum for early childhood education. Analysis of successful kindergarten programs and survey of nursery school curriculum as a background for kindergarten curriculum development.
- 3452 Language Development for Young Children**
 A study of communications, oral, visual and non-verbal, with particular attention to problems of this region. Techniques for helping and encouraging children to develop effective communications with others. A study of meanings experienced by young children. Specific study of the Southwest Cooperative Educational Laboratory's Oral Language Program and other new developments in communications among young children. Techniques for teaching children to listen, observe, and speak clearly and with comprehension.
- 3491 Professional Laboratory Experience in the Kindergarten (1.5-10)**
 A minimum of 120 clock hours of laboratory observation in a kindergarten classroom, and a minimum of one and one-half hours per week in on-campus seminar. *Prerequisites:* A grade point average of at least 2.5 in Ed. P.&C. 3401, Ed. C. 3451, or Ed. C. 3452; permission of the Director of Field Experiences, and either:
 (1) concurrent registration for Ed. C. 3496, or
 (2) Provisional Elementary Certificate.

Library Services

Basic courses in Library Services have been designed (1) to provide a foundation for the student who plans to take further work at an institution offering a degree in this field, (2) to provide sufficient training to equip a teacher or prospective teacher for work in a school library under supervision of a professional librarian, and (3) to provide knowledge which will enable the classroom teacher to make broad, effective use of the school library.

(Sponsored by the School of Education)

- 3301 Survey of School Library Services: Cataloging and Classification (3.0)**
 Introduction to the principles and functions of the dictionary catalog; to descriptive cataloging according to the Anglo-American cataloging rules; to the use of Dewey Decimal Classification, Sears subject headings and ALA rules for filing catalog cards. Practice in the application of the principles of cataloging and classification to special types of materials.

School of Education

- 3302 Survey of School Library Services: Organization and Operation (3-0)**
Introduction to the management and operations of library and media centers; objectives and current trends in Library services; consideration of problems of budget planning, personnel, facility needs; sources of Federal, State and local funds available for operating media programs; and a study of the practical methods for acquisition, processing, circulation, and inventory of materials for the Center.
- 3303 Books and Other Media Selections for Elementary School Libraries (3-0)**
Principles of selection, evaluation, and use of books and nonprint media for elementary grades (K-6). Emphasis is on wide reading and examination of materials for both curriculum enrichment and recreational reading. Instruction in the use of standard selection aids.
- 3304 Books and Other Media Selections for Secondary School Libraries (3-0)**
Principles of selection, evaluation, and use of materials for the secondary grades (7-12), with emphasis on wide reading and examination of materials. Study of the needs, abilities, and reading interests of adolescents. Practice in the use of bibliographic aids as guides to selection.
- 3306 The Teacher and the School Library (3-0)**
Designed to meet needs both of the teacher who may work in the library and the teacher or prospective teachers who wants to use the school library with maximum effectiveness in teaching. Provision made for specialization in elementary or secondary schools. *Prerequisite:* Junior standing.
- 3495 School Library Observation and Practice (1.5-10)**
A minimum of 140 clock hours of laboratory observation and practice in public school libraries, and a minimum of one and one-half hours per week in on-campus seminar. The student, in conference with the supervisor of library practice, selects either elementary school or secondary school library for major emphasis, and spends 100 hours there. The remaining 40 hours is spent at the other level. *Prerequisite:* Twelve hours credit in Library Services and permission of the Director of the Field Experiences.

READING

- 3404 Developmental Reading in the Elementary School (3-0)**
Developmental reading growth, curriculum, methods, and materials in the elementary school with special attention to the Spanish speaking child.
- 3408 Reading and Study in the Content Areas (3-0)**
Methods and materials for developing maturity in reading and study skills, especially in the content areas. Special emphasis is given to the development of interest, the matching of students to proper materials, instructional techniques for integrating the teaching of skills with the teaching of content, and the development of flexibility of reading rate.
- 3423 Teaching Critical-Creative Reading (3-0)**
Methods and materials for developing higher level cognitive and affective reading behaviors among students from K-12. Teaching strategies which provide for the development of critical-creative readers in both reading and content area subjects will be designed. *Prerequisite:* Ed. C. 3404 or 3408.
- 3424 Reading Laboratory Experience (Elementary) (3-0)**
Laboratory experience for the application of concepts, media, and evaluation in reading in the elementary school. *Prerequisite:* Ed. C. 3404 or 3408, and 3441.
- 3425 Reading Laboratory Experience (Secondary) (3-0)**
Laboratory experience for the application of concepts, media, and evaluation in reading in the secondary school. *Prerequisite:* Ed. C. 3404 or 3408, and 3441.
- 3426 Seminar in Reading (3-0)**
In-depth discussions of theories, materials, and research on topics in reading of the student's choice. *Prerequisite:* Ed. C. 3404 or 3408.

- 3441 The Diagnostic Teaching of Reading (3-0)**
 A study of standardized and informal materials and techniques for diagnosing the reading strengths and weakness of individuals and groups, techniques and materials for building specific reading abilities, and methods of individualizing instruction and grouping according to student needs and interests. *Prerequisite:* Ed. C. 3404 or 3408; may not be taken for credit by those who have taken Ed. C. 3541.
- 3449 Analysis and Evaluation of Reading Materials (3-0)**
 An examination of classroom reading materials representative of various facets and philosophies in the teaching of reading. A major emphasis will be focused upon the development of criteria for the selection of materials appropriate for specific individuals and groups of children. *Prerequisite:* Ed. C. 3404 or 3408.
- 3480 Linguistic Approaches to Reading Instruction in the Elementary School (3-0)**
 Basic linguistic concepts will be explored as they relate to language development and reading instruction in the elementary school. Linguistically oriented reading programs will be examined with considerations given to their appropriateness for children of various language backgrounds, including Spanish-English. *Prerequisite:* Ed. C. 3404 or 3408; may not be taken for credit by those who have taken Ed. C. 3580.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Eighteen semester hours of Education, twelve of which must be advanced course work, and a bachelor's degree.

- 3501 Educational Research Methods (3-0)**
 A study of methods, techniques, designs of educational research including execution of simple research projects. The course involves both theory and practice. *Prerequisite:* Ed. P.&G. 3500.
- 3502 Problems in Education — Seminar (3-0)**
 A course emphasizing educational research in both the elementary and secondary school fields. The student is allowed to make a choice of the field in which to carry on educational research. *Prerequisite:* Twelve semester hours of graduate courses in Education.
- 3503 Problems in Education — Seminar (3-0)**
Prerequisite: Ed. C. 3502.
- 3506 Remedial Reading (3-0)**
 Examination and appraisal of significant researchers in the field of remedial reading. Attention given to the analysis and diagnosis of individual cases of reading retardation, and to corrective and remedial procedures. *Prerequisite:* Ed. C. 3404 or 3408.
- 3507 Educational Sociology (3-0)**
 A survey of the field of educational sociology and its application to problems in modern education.
- 3508 Instructional Problems (Elementary) — Seminar (3-0)**
 Study of teaching problems arising in the classroom. Students will choose their own problems and those with allied interests will be grouped together to facilitate individual research. The instructor will guide this research.
- 3509 Instructional Problems (Secondary) — Seminar (3-0)**
 Same as Ed. C. 3508, except the problems are at the secondary level.
- 3510 Comparative Education (3-0)**
 A comparison study of Educational systems of representative European, Latin American, and Afro-Asian countries.

School of Education

- 3511 Curriculum Construction and Organization of Secondary Subject Matter — Seminar (3-0)**
The study of recent curriculum developments in secondary schools, with emphasis on new curricula in subject areas. The purposes and processes of secondary school curriculum. The development of curriculum guides. Each student will thoroughly investigate one curriculum area.
- 3512 Curriculum Problems in Science Education — Seminar (3-0)**
The student is permitted to devote his attention exclusively to a pertinent curriculum problem in science education either in the elementary or secondary school field.
- 3513 The Curriculum in the Elementary School (3-0)**
Particular attention given to selection and organization of materials in reference to curriculum development in the elementary school.
- 3515 Clinical Reading Laboratory Experience (3-0)**
Actual laboratory experience for application of concepts, media and evaluation, to meet reading disadvantages in the elementary grades.
- 3523 Educational Trends — Seminar (3-0)**
A critical consideration of selected trends in education.
- 3527 Psychology of Reading (3-0)**
Study of the reading process in such areas as language development, the psychology of learning, sensory, perceptual, and neurological factors, special problems of the culturally different child, emphasis on the study and evaluation of research literature and intensive study in individual topics of interest. *Prerequisite:* Ed. C. 3404 or Ed. C. 3408.
- 3534 Clinical Diagnosis of Reading Difficulties (3-0)**
Comprehensive study and clinical practice in the diagnosis of specific, limiting, and complex cases of reading disability. Experiences in administering and interpreting batteries of diagnostic tests and in the analysis and synthesis of findings for case studies. *Prerequisite:* Ed. C. 3404 or Ed. C. 3408.
- 3538 Introduction to the Junior College**
The Junior College and its role in preparing students for job entry and for senior college admission. The philosophy, organization, development of programs, special problems, and the emerging role of the private and public junior college. *Prerequisite:* 18 semester hours of advanced education courses.
- 3539 Competency-Based Curricula (3-0)**
An advanced, intensive study of the criteria for and functional relationships between interactive elements in behavior modification and new curricular designs identifiable as individually guided learning situation. Special emphasis is given to performance criteria, criterion-referenced tests and feedback mechanisms as they relate to learning packages. *Prerequisites:* Twelve semester hours advanced credit in Curriculum and Instruction.
- 3540 Philosophies of Education**
An in-depth study of major philosophies of education and their impact on education in the United States.
- 3541 The Diagnostic Teaching of Reading (3-0)**
A study of standardized and informal materials and techniques for diagnosing the reading strengths and weaknesses of individuals and groups, techniques and methods of individualizing instruction and grouping according to student needs and interests. *Prerequisite:* Ed. C. 3404 or 3408; may not be taken for credit for those who have taken Ed. C. 3441.
- 3542 Problems in Reading — Seminar (3-0)**
A course emphasizing educational research in reading. The student is allowed to make a choice of the field in reading in which to carry on educational research. *Prerequisite:* Ed. C. 3404 or 3408, and Ed. P.&G. 3500, Ed. C. 3501, or consent of the instructor. May be repeated for credit.
- 3543 Problems in Reading — Seminar (3-0)**
Prerequisite: Ed. C. 3542 or Ed. C. 3502 and 6 semester hours in reading.

- 3548 Practicum in Instruction in Elementary and Secondary Schools (1.5-10)**
 Designed to be concurrent with the first year of public school level teaching. Includes observation by the university instructor of the classroom teaching of the student and seminars designed to relate the classroom instructional situation to the corresponding educational theory. May be repeated once for credit. *Prerequisite:* A grade point average of at least 2.5 in each teaching field and in all education courses, and permission of the Coordinator of Professional Laboratory Experiences.
- 3549 Seminar in Student Teacher Supervision (3-0)**
 Analysis of research and theory related to supervisory behavior in student teaching as related to the best practice in outstanding student teaching centers. Designed specifically for public school teachers who serve as supervising teachers in the student teaching program of the University, but open to others. *Prerequisite:* Permission of the instructor.
- 3550 Graduate Workshop in Education (3-0) (Area of study will be designated)**
- 3551 Seminar in Reading (3-0)**
 An in-depth exploration of ways of developing higher level cognitive, affective, and psychomotor abilities of students through the use of printed materials and other media. Individual and/or group creative projects and research findings will be shared. *Prerequisite:* Ed. C. 3408 or 3404.
- 3580 Linguistics and Its Application to Elementary Reading Instruction (3-0)**
 Various types of linguistic systems will be described and related to elementary reading instruction. Earlier European and American schools of linguistics and more recent Transformationalist linguistic reading programs and evaluated for use with children of various language backgrounds, including Spanish-English. *Prerequisite:* Ed. C. 3404 or 3408. (May not be taken for credit by those who have taken 3480.)

EDUCATIONAL ADMINISTRATION AND SUPERVISION

W. GEHALD BARBER, *Chairman*

Professors BARBER, FOSTER, JARVIS, MEADOWS;

Associate Professors ARCINIEGA, C. BROOKS.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Education and a Bachelor's degree.

- 3502 Problems in Educational Administration — Seminar (3-0)**
A course emphasizing research in the Educational Administration field. The student is allowed to make a choice of the field in which to carry on educational research. *Prerequisite:* Twelve semester hours of graduate courses in Education or permission of Professor.
- 3524 Public School Supervision (3-0)**
The study of leadership for instructional improvement. The roles of supervisor, principal, other administrators, and teachers in improvement of teaching and learning in elementary and secondary schools. Study of group dynamics, the change process, observational techniques, interaction analysis, and teacher-supervisor interviews.
- 3525 The Administration of Teaching Personnel (3-0)**
A course in ethics of the various relationships between teachers and other school employees and the numerous "outside groups, interests, individuals, and officials."
- 3526 Public School Finance (3-0)**
Consideration is given to such matters as public school revenue, budget making and administration, accounting procedures and records, and school bonds.
- 3528 Organization and Administration of the Elementary School (3-0)**
Problems confronting the elementary school principal will be studied. For example, teacher schedules, classroom schedules, teachers' meetings, organization of the staff, supervision, curriculum development, and related problems will be considered.
- 3529 The School Plant (3-0)**
Specialized study of all facets of the school plant planning and maintenance.
- 3530 Public School Law (3-0)**
A study of the constitutional provisions, legislation, court decisions, and regulations governing the public schools with special reference to Texas.
- 3531 Principles of Public School Relations (3-0)**
Principles, techniques, and methods used in school public relations. Relationships include the school board and the public, the superintendent in the public relations program, school personnel and the public, the public relations of professional organizations.
- 3532 Organization and Administration of the Secondary School (3-0)**
The study of problems pertaining to teachers' meetings, organization of the staff, supervision, curriculum development, and related problems.
- 3533 Field Experience and Internship in Educational Administration (1-4)**
On-the-job training in public school administration for students in the program for elementary principal, secondary principal, and superintendent. *Prerequisite:* Eighteen hours of graduate credit beyond the Master's degree.
- 3535 Fundamentals of Public School Administration (3-0)**
Basic administrative concepts and processes; organization of public school administration; roles of the superintendent and other central office personnel; relationship of the local school district to the Texas Education Agency, federal educational agencies and other educational institutions.

EDUCATIONAL PSYCHOLOGY AND GUIDANCE

JAMES F. DAY, *Acting Chairman*

Professors DAY, C. WALKER;

Associate Professors B. BROOKS, DAVIS, J. R. WALKER;

Assistant Professors CALKINS, KIDD, LANDRUM, SLETTEDAHL;

Lecturer PRESTWOOD.

For Undergraduate Credit Only

- 3201 Introduction to Educational Psychology (3-0)**
A study of the learning process with attention given to growth and development, conditions of effective learning, adjustment, and individual differences and evaluation. Open to all students.
- 3301 Psychology of the Elementary School Child (3-0)**
A study of the phases of the development and behavior of the child in the elementary school. Also provision for observation of the elementary school child as an individual and as a member of a group. *Recommended prerequisite:* Ed. P.&G. 3201 or Psychology 3101.
- 3308 Psychological Foundations of Elementary Education (3-0)**
Introductory course in applications of psychological principles and knowledge to elementary education practices.
- 3310 Psychology of the Secondary School Student (3-0)**
A study of the phases of development and behavior of the adolescent. Also, provision for observation of the adolescent as an individual and as a member of a group. *Recommended prerequisite:* Ed. P.&G. 3201 or Psychology 3101.
- 3314 Psychological Foundations of Secondary Education (3-0)**
Introductory course in applications of psychological principles and knowledge to secondary educational practices. (This course may not be counted for credit in addition to Ed. P.&G. 3201 and/or 3308 and/or 3420.)
- 3400 Elementary Educational Statistics (3-0)**
A study of the basic statistical concepts as applied to research in education. Topics include descriptive and inferential statistics. Consideration is given to measures of central tendencies, variabilities, correlations, elementary statistical inference through two-way analysis of variance.
- 3401 Psychology of the Kindergarten Child**
A study of child development through the pre-school years. Survey of characteristics of four and five-year-old children and of individual differences among them. Observation and research concerning young children at play. *Research concerning* processes of learning, interaction, natural and effective, for young children, and the development of the child's self-concept.

For Undergraduates and Graduates

Prerequisite for courses listed below: Twelve semester hours of Education

- 3420 Introduction to Guidance for Secondary School Teachers (3-0)**
A study of the educational, social, and psychological foundations of guidance in schools, colleges, and industry. The historical development of the guidance movement, the philosophy and scope of guidance and the role of the teacher and counselor in their relationships to the total educational program. Analysis of individual students as a basis for guidance.

SPECIAL EDUCATION

- 3409 The Education of Exceptional Children (3-0)**
Consideration given to the philosophy, problems, treatment and methods of providing appropriate education and training for exceptional children.
- 3421 Psychology of Mental Retardation (3-0)**
Consideration of basic psychological problems and research pertaining to mentally retarded children with emphasis on the study of the social, emotional, physical, and learning characteristics of mentally retarded children.
- 3422 Curriculum, Materials, and Methods of Teaching the Mentally Retarded (3-0)**
Basic organization of programs for educating the mentally retarded at the primary, intermediate, and secondary setting. Curriculum development, principles of teaching, and instructional materials, methods, and records pertaining to the education of the mentally retarded.
- 3429 Observation, Teaching, and Field Work with Mentally Retarded — Seminar (1-2)**
Prerequisite: Ed. P.&C. 3409, 3421, and 3422 or permission of the head of the department.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Education and a bachelor's degree.

- 3500 Introduction to Statistics (3-0)**
Study of fundamental statistical concepts, to include probability distributions, sampling distribution and certain non-parametric procedures. Introduction of experimental design and applied statistical research procedures. Graduate standing.
- 3502 Problems in Counseling — Seminar (3-0)**
A course emphasizing educational research in both the elementary and secondary school fields. The student is allowed to make a choice of the field in which to carry on educational research. *Prerequisite:* Twelve hours of graduate work including Ed. P.&C. 3500.
- 3505 The Construction and use of Achievement Examinations — Seminar (3-0)**
Covers the theory of testing and provides practical experience in both critical analysis and construction of tests for classroom use. The student will be allowed to devote his attention exclusively either in the elementary school level or to the secondary, thereby receiving credit in elementary education or in secondary.
- 3508 Workshop in Guidance and Counseling — Seminar (3-0)**
Study of current issues and problems in guidance and counseling. Students will choose their problems and those with allied interests will be grouped together to facilitate individual research. Instructor will supervise this research.
- 3514 Guidance in The Elementary School (3-0)**
The purpose and scope for guidance at the elementary level with emphasis placed upon the function of guidance in relation to children's needs and development, the work of guidance personnel, and teachers roles in relation to prevention of problems, techniques and skills of diagnosis and counseling which can be used by counselors, experienced teachers and beginning elementary teachers.
- 3516 The Psychology of Individual Differences (3-0)**
The study of individual differences in intelligence, school achievement, vocational aptitudes, personality, interests and attitudes; study of varieties of group differences; and study of methods used in studying human differences.
- 3517 Psychology of Personality Development of Secondary School Student (3-0)**
Study of mental hygiene, and the nature and development of personality, and personality theory and assessment.

- 3518 Techniques of Counseling (3-0)**
A study of the basic principles of counseling (interviewing). Emphasis on types of interviews, content and processes in counseling, counselor leads, practices in the various techniques of counseling, and specific types of vocational, educational, personal and counseling problems. *Prerequisite:* Ed. P.&G. 3539.
- 3519 Organization and Administration of Guidance Services (3-0)**
A study of problems of supervision, organization and administration of guidance services. Problems of staffing, finances, effective interpersonal relationships, community participation, in-service education, and evaluation of the guidance program.
- 3520 Socio-Economic Information in Guidance — Seminar (3-0)**
Educational, occupational, and social information and its use in counseling and guidance.
- 3521 Independent Study of Special Education — Seminar (3-0)**
This course offers opportunities for study in any one of the following special education areas: orthopedic handicaps, visual handicaps, auditory handicaps, giftedness, mental retardation.
- 3522 Supervised Practice in Counseling — Seminar (3-0)**
Actual practice under supervision in applying the principles, tools, and techniques used in the guidance program. Students will be assigned to guidance workers in this area and supervised and instructed by an instructor in the Department of Ed. P.&G. of The University of Texas at El Paso. *Prerequisite:* Ed. P.&G. 3518 and permission of graduate advisor.
- 3524 Differential Diagnosis (3-0)**
Diagnostic interpretation of various standardized tests and other procedures commonly used in a school setting. Emphasis will be placed on applying data to correcting learning problems, disabilities, and the development of potentials. *Prerequisites:* Ed. P.&G. 3500, 3535, 3536.
- 3535 Principles of Psychological Testing (3-0)**
Study, evaluation, and use of educational and psychological tests used in the study and guidance of students. *Prerequisite:* An introductory course in tests and measurement.
- 1536 to 6536 Individual Mental Testing for General and Special Abilities (3-0)**
The administration, observation, demonstration and critical evaluation of testing procedures. Preparation of reports, both professional and individual, is stressed. Basic tests will be the Stanford-Binet Intelligence Scale, and two of the Wechsler tests (WAIS, WISC, WPPSI). If taken for more than three semester hours credit, the tests administered will include three of the following: Pictorial Test of Intelligence, Columbia Mental Maturity Scale, Goodenough-Harris Drawing Test, Arthur Point Scale of Performance Tests, Modern Language Aptitude Test, Musical Aptitude Profile, Illinois Test of Psycholinguistic Abilities, and tests of mechanical aptitude. *Prerequisite:* Ed. P.&G. 3500 and 3535.
- 3537 Independent Graduate Study — Seminar (3-0)**
Prerequisite: Permission of the Graduate Advisor.
- 3538 Mental Hygiene in Education (3-0)**
Psychological principles, theories, and practices examined and applied to the individual school, family, and community mental health problems. Implications of school practices for mental health.
- 3539 Group Guidance Technique (3-0)**
A study of the principles, theory, process and dynamics in small group guidance and counseling as applied to human relations.
- 3540 Educational Psychology — Seminar: Theories of Learning (3-0)**
Discussion of types of learning theory, behavioristic, cognitive, and functional. Student reports and discussion of primary source material — Thorndike, Tolman, Watson, Skinner, Guthrie, Robinson, Ausbel, mathematical learning theory, information learning theory, and neurophysiology of learning. Discussion of the relation of psychoanalytic, phenomenological, Piagetian, and Brunerian approaches to learning theory.

School of Education

- 3541 Theories of Counseling (3-0)**
A study of the various counseling theories and their application to the counseling process.
- 3542 Computer Methods in Education and the Behavioral Sciences (3-0)**
Application of computers to various problems in education and the behavioral sciences with emphasis on data processing machines, programming languages, and utilization of existing program libraries for data analysis. *Prerequisites:* Ed. P.&G. 3500 or the equivalent.
- 3570 Advanced Statistics (3-0)**
Review of experimental design. Study of tests of hypothesis, linear regression and analysis, correlation analysis, multiple variate analysis. Introduction to research operation related to computers. *Prerequisite:* Ed. P.&G. 3400 or 3500.
- 3550 Education Workshop**
(Area of study will be designated).
- 3598-99 Thesis Course for Master's Degree (3-0)**
Prerequisite: Twelve semester hours of advanced courses in Ed. P.&G., and permission of the head of the department.
- 6523 Internship in Counseling (6-0)**
Supervised experiences in counseling at selected agencies and institutions. *Prerequisite:* Permission of graduate advisor and Ed. P.&G. 3522.

HEALTH & PHYSICAL EDUCATION

JAMES G. MASON, *Chairman*

Professors HARDIN, HARRIS, MASON, MAYSHARK; *Associate Professors* COLLINS, McCARTY; *Assistant Professors* CRAIGO, FREISCHLAG, GLARDON, B. KELLY, LOPER, POTEET; *Lecturer* N. KELLY; *Instructor* MOORE; *Teaching Assistants* ELLISON, JOYCE, SHOOP, VANDENBURG

HEALTH EDUCATION

For Undergraduates

General prerequisite: Junior standing for all 3300 or 3400 level courses.

3101 Health Science Information (3-0)

Open to all students. Scientific information essential to the understanding of individual and community health problems with major consideration of the latest research related to such areas as cancer, heart disease, narcotics, smoking, obesity, physiological aspects of exercise.

3201 First Aid and Safety Education (3-0)

Theory, demonstrations and practices in techniques of first aid and safety. Required of physical education majors. Open to all students. American Red Cross Standard First Aid Certification may be earned.

3202 Nutrition Education (3-0)

The normal nutritional needs of the school-age child and his family will be analyzed. Extensive studies will be made of factors affecting food choice and meal patterns; the scientific bases for nutrient components of an adequate diet and its practical application; and local, national and world nutritional problems.

3402 Field Experiences in Health Education (3-0)

Observation and participation in educational activities of public health agencies including official and voluntary. Planning and supervision done jointly with University staff members and agency representatives. *Prerequisite:* H.E. 3301.

3403 Fundamentals of Family Life and Sex Education (3-0)

Basic knowledge, attitudes and issues regarding psychosocial, historical and comparative cultural aspects of human sexuality from conception to senility. Consideration will be given to adjustment needs and problems of children and adults in contemporary American society and to sex education programs in the schools. *Prerequisite:* H.E. 3401.

For Undergraduates and Graduates

3301 Community Hygiene (3-0)

Consideration of health of people as a group and with the social and governmental agencies which are concerned with environmental control and health protection. Three hours of lecture per week and special field trips. *Prerequisite:* Junior standing or permission of the chairman of the department.

3302 Elementary School Health Education (3-0)

Major problems in the organization and administration of elementary school health programs will be analyzed. *Prerequisite:* Junior standing or permission of the chairman of the department.

3303 Modern Problems in Health Education (3-0)

A study of the normal functioning of every integral part of the human body. Care and prevention of communicable diseases will be discussed and the value of the new drugs in the treatment of such. This course will try to give the individual a concept in the modern method for a healthful life. *Prerequisite:* Junior standing or permission of the chairman of the department.

3307 Methods and Materials in Health Education (3-0)

The scope of Health Education in the secondary school. Problems in administering the school health education program. Teaching aids and methods for the teacher responsible for health instruction. The teacher's part in the health protection of children. *Prerequisite:* Junior standing or permission of the chairman of the department.

3401 Health Education in the Secondary School (3-0)

Responsibilities of school for health instruction; adolescent health problems, and their relationship to instruction; social implications of individual and group health. *Prerequisite:* H.E. 3101. Junior standing.

PHYSICAL EDUCATION

For Undergraduates

1101 Activity Course for Men (0-3)

May be repeated for credit. Open to all students.

1102 Activity Course for Women (0-3)

May be repeated for credit. Open to all students.

1103 Activity Course (0-3)

Activity Course. Co-educational. May be repeated for credit. Open to all students.

SKILLS COURSES FOR PHYSICAL EDUCATION TEACHING FIELD

Men and Women

P.E. 1201	3 skills	P.E. 1204	3 skills
P.E. 1202	3 skills	P.E. 1205	3 skills
P.E. 1203	3 skills	P.E. 1206	3 skills

For each one of the physical education skills courses listed above, students must attain proficiency in any three skills which are listed under required and elective skills below. For six hours of skills credit all of the required list must be completed, and any six from the elective list. None may be repeated for credit. Students must register for the skills courses 1201, 1202, 1203, 1204, 1205, 1206 at registration times, and sign up for the individual skills in the physical education office.

REQUIRED SKILLS

(All Must Be Taken)

1. Conditioning
2. Football (men)
Creative dance
Modern dance (women)
3. Basketball
4. Track & Field
5. Softball
6. Volleyball
7. Swimming I
8. Wrestling (men)
Field Hockey (women)
9. Gymnastics I
10. Tennis
11. Rhythms
12. Soccer

ELECTIVE SKILLS (Select Six)

1. Archery
2. Bowling
3. Badminton
4. Gymnastics II
5. Handball
6. Folk Dance
7. Swimming II
8. Fencing
9. Social Dance
10. Judo (M) (W)
11. Karate
12. Golf

PHYSICAL EDUCATION

For Undergraduates

3103 Introduction to Physical Education (3-0)

An overview of historical and philosophical aspects of physical education internationally and nationally, and the current relationship of physical education to the broad spectrum of present day education. In addition, orientation to programs in school, college, and community.

- 3205 Methods and Materials for Elementary Schools (3-0)**
Materials, class management and instructional techniques in the physical education program for the elementary school. A major emphasis will be on movement exploration and basic movement skills leading through progressions and variations to skill acquisition in dance, major and minor games, gymnastics, and individual sports.
- 3206 Techniques of Coaching Football and Basketball (3-0)**
Coaching methods and problems. Fundamentals of varsity team play; comparison of systems; strategy; training, conditioning; selection of men for positions; responsibilities of the coach; and public relations. *Prerequisite:* Sophomore standing.
- 3207 Techniques of Coaching Track and Field and Baseball (3-0)**
Prerequisite: Sophomore standing.
- 3208 Recreation Leadership (3-0)**
Philosophy, principles, methods, practical experiences, and professional preparation for leadership in the field of recreation.
- 3215 Historical and Cultural Aspects of Dance (2-1)**
A practical survey of the emergence of dance on the American scene in the 20th century, with consideration of dance as an expressive art in education.
- 3304 Current Methods and Materials in Physical Education in Secondary Schools (3-0)**
A course designed to develop methods, teaching techniques, and materials for the teaching of physical education in the secondary schools with major emphasis on teaching of team sports. *Prerequisite:* Four semesters of skill courses and junior standing.
- 3305 Current Methods and Materials in Physical Education in Secondary Schools (3-0)**
Major emphasis on teaching of dual and individual sports. *Prerequisite:* Four semesters of skills courses and junior standing.
- 3316 Techniques, Methods and Materials of Instruction in Dance (1-2)**
A class in dance materials in tap and modern dance. *Prerequisite:* Twelve semester hours of physical education or permission of the chairman of the department.
- 3317 Fundamentals of Creative Dance Technique and Composition (3-0)**
The study of dance through varied experiences in movement, including historical and contemporary forms with emphasis on increasing the ability to use movement creatively and to relate to dance the principles and elements of other arts. The elements and process of dance composition and practice in individual and group composition and evaluation will also be considered. *Prerequisite:* Junior standing or permission of instructor.
- 3318 Physical Education for the Pre-school and Kindergarten Child (3-0)**
A course designed to introduce future teachers of this age group to the types of activities suitable for the pre-school and kindergarten child. The course will include movement education (basic rhythms), creative dance, singing games, low organized activities, and water confidence.
- 3408 Sports Officiating (3-0)**
Opportunity will be provided for a student to learn and interpret the rules and playing regulations, the mechanics of officiating and the psychological aspects of officiating sports activities included in a sound program of athletics and physical education. *Prerequisite:* Twelve semester hours of physical education or permission of the chairman of the department.
- 3409 Sports Activities, Injuries, Training, and Emergency Care (3-0)**
The recognition and prevention of injuries in sports activities as well as the emergency care provisions for the usual physical education and playground injuries are emphasized. *Prerequisite:* Senior standing.

- 3496 Professional Laboratory Experience in the Elementary School (3-0)**
A minimum of ten hours a week for one semester of laboratory observation and teaching experience in an elementary school program of health and physical education. *Prerequisite:* A grade point average of at least 2.0 in both English 3101-02 and Speech 3101; of at least 2.5 in health and physical education courses; 2.0 over-all; Ed. C. 3301-02; P. E. 3205; senior standing and permission of college supervisor of student teaching. Student must file a student teaching application with their college supervisor during the spring semester preceding the taking of the course.
- 3498 Professional Laboratory Experience in the Secondary School (3-0)**
A minimum of ten hours a week for one semester of laboratory observation and teaching experience in the health and physical education program in the secondary school. *Prerequisite:* A grade point average of at least 2.0 in English 3101-02 and Speech 3101; of at least 2.5 in health and physical education courses; 2.0 over-all; Ed. C. 3310-11; P.E. 3304; senior standing and permission of college supervisor of student teaching. Student must file a student teaching application with their college supervisor during the spring semester preceding the taking of the course.
- 6498 Student Teaching in the Secondary School (2-20)**
Directed and closely supervised performance in the full range of duties of a secondary school teacher, conducted in cooperating schools. Accompanying directed study and evaluative seminars. Required in the professional development sequence for approved programs in secondary education. Consumes a four-hour daily block of time, M-F, in addition to seminar. *Prerequisite:* A grade point average of at least 2.0 in both English 3101-02 and Speech 3101; of at least 2.5 in health and physical education courses; 2.0 over-all; Ed. C. 3310, 3311, 3312, 3420; P.E. 3304; senior standing and permission of college supervisor of student teaching. Student must file a student teaching application with their college supervisor during the spring semester preceding the taking of the course.

FOR UNDERGRADUATES AND GRADUATES

- 3303 Tests and Measurements in Health and Physical Education (3-0)**
A study of tests will be made, both in health and physical education as to their purpose and use, scoring and interpretation. *Prerequisite:* Twelve semester hours in physical education or permission of the chairman of the department.
- 3311 Organization and Administration of Physical Education (3-0)**
The place of physical education in the total educational situation will be presented, along with fundamental aspects of a well-rounded physical education program. Particular emphasis on the administrative problems underlying a functional program. *Prerequisite:* Twelve semester hours of physical education. Junior standing.
- 3312 Kinesiology (3-0)**
Analysis of movements, specialized skills, and motor coordination in terms of the mechanics of skeletal and muscular movement. *Prerequisite:* Biology 3105-1107, 3106-1108, and twelve semester hours of physical education.
- 4301 Exercise Physiology (3-1)**
Physiological adaptations of circulatory, respiratory, excretory, digestive, endocrine and muscular systems to exercise and the relationships of these adaptations to physical education and athletics. *Prerequisite:* Biology 4211 and 4212.
- 3410 Health and Physical Education Seminar (3-0)**
Seminar covering selected areas of health and physical education. This course may be substituted for a deficiency in the advanced physical education requirements for the physical education teaching fields. *Prerequisite:* Senior standing and permission from chairman of the department.
- 3414 Special Physical Education (2-1)**
Development of an understanding of the atypical child and programs of physical education adapted to his needs. The nature of physical, mental, emotional, and social disabilities will be discussed with application of corrective, developmental, and remedial physical activities. Practical laboratory experiences will be provided. *Prerequisite:* Junior standing.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Health and Physical Education and a bachelor's degree.

- 3501 Seminar in Health and Physical Education (3-0)**
A seminar with emphasis on research in health and physical education in both the elementary and secondary school fields. The course will include methods of research, selecting a problem and preparing a written report on the study of the problem. May be repeated for credit.
- 3502 Critical Analysis of Professional Literature (3-0)**
Designed for advanced student in the field of health, physical education, recreation and safety. Major emphasis will be placed upon health and physical education. Thorough study and consideration will be given to the literature in the field which is likely to have the greatest influence on programs, procedures and practices in health, physical education, recreation and safety in the school and community.
- 3503 Supervision of Health and Physical Education (3-0)**
The purpose of this course is to present and discuss the responsibilities of the supervisor of health and physical education in the school and community. Observation, techniques, standards of judging instruction, the supervisory conferences, cooperative supervision, basic foundation of curriculum construction and lesson planning. Emphasis is placed on the common problems met by the supervisor in health and physical education in elementary and secondary schools.
- 3504 Curriculum Construction in Health Education (3-0)**
The study of curriculum construction with respect to the establishment of basic curriculum philosophies, the application of educational principles, the acquisition of materials, and the comprehension of the sequence of content as recommended by the Texas Education Agency. Health education curriculum will be studied at all public school levels.
- 3505 Research Methods (3-0)**
Designed to familiarize the student with the basic forms of research employed in health and physical education. Emphasis will be given to: experimental research, descriptive research, causal research, historical research, and philosophical research with direction given to library techniques.
- 3506 Scientific Basis of Physical Education (3-0)**
Designed to approach at an advanced level the kinesiological, mechanical, physiological and psychological aspects of physical education. *Prerequisite:* P.E. 3312 or equivalent.
- 3507 Program Planning and Administration of Physical Education (3-0)**
Program building including criteria for the selection of activities and progression, and other factors affecting course of study construction such as facilities, equipment, budget, laws, policies, and professional responsibilities. *Prerequisite:* P.E. 3311 or Ed. C. 3535.
- 3508 Sociological and Psychological Foundations of Physical Activity and Sport.**
The study of socio-psychological processes, principles, and factors affecting man's behavior in physical activity and sport. Investigation is made of current socio-psychological problems with implications for physical education and athletic coaching.
- 3509 Advanced Topics in Health and Physical Education**
This course will emphasize individual problems in the field of health and physical education. The course may be repeated once for credit.
- 3510 Seminar: The Teaching of Family Life and Sex Education**
The purpose of this course is to improve teacher understanding and to investigate and develop curriculum methods and materials at various grade levels. Particular emphasis to the needs of school children pertaining to their sexuality as it relates to total growth will be given. Programs, problems, trends and basic issues will be considered.

School of Education

- 3511 Evaluation in School Health Instruction**
Principles of objective test construction; the place of behavior and attitude scales, check lists, questionnaires, surveys, and inventories in the evaluation of health instruction. Includes criticism of several commercially prepared tests and construction and standardization of a test. *Prerequisite:* P.E. 3303, Ed. C. 3312 or equivalent.
- 3513 Seminar: Problems in Content and Method in Health Instruction (3-0)**
A course for experienced teachers that emphasizes flexibility and change in content and method to meet the needs, interests and abilities of students. Highlights environmental and age differences of students that challenge the teacher's skill to teach effectively. *Prerequisite:* Twelve advanced hours of physical education, teaching experience, or permission of graduate advisor.
- 3514 Current Issues in School Health Education**
Individual identification and study of current issues in school health education. Extensive reading and critical analysis of literature required.
- 3515 Curriculum in Physical Education (3-0)**
Analysis of criteria and procedures for curriculum construction in physical education; development of written guides for programs in elementary and secondary schools, colleges and universities.
- 3516 Facilities Planning in Health, Physical Education and Recreation (3-0)**
Principles, standards and designs utilized in planning, construction and maintenance of indoor and outdoor facilities. To prepare students to serve as physical education, recreation and athletic program consultants to facility planning committees.
- 3517 Administration of Recreation Programs (3-0)**
Organization and Administration of recreation programs in communities and educational institutions. Analysis of planning programs, legal problems, public relations, personnel administration, areas and facilities and finance and business procedures.
- 3518 Problems in the Organization and Administration of Athletics (3-0)**
Problems in managing the affairs of athletic programs: including intramural sports, interscholastic and intercollegiate athletics. Consideration will be given to policies, contest management, facilities and equipment, finances and budgets, scheduling, safety, public relations and legal liability.
- 3550 Workshop in Problems in Health and Physical Education**
- 3551 Advanced Workshop in Problems in Health and Physical Education**
- 3598-3599 Thesis**



School of Engineering

RAY W. GUARD, *Dean*

The School of Engineering at UTEP can now boast about the increasing number of women that have joined its ranks. These young women diligently pursue their interest in engineering, which will someday lead to a challenging and interesting career.

A student section of the Society of Women Engineers received its charter in March of 1969. In June of 1972 a delegation attending the National SWE meeting in Boston, Mass. proudly brought back to UTEP a trophy as the "Best Student Section for 1971-72." Having achieved national recognition for the second time, the girls are increasing their efforts to interest young women in preparing for an engineering future. Through close association in SWE, women students encourage each other, visit area high schools to inform the students of the opportunities available for women engineers, and arrange technical tours of industry so they may know what is being done in the industrial world.

The School of Engineering has women students enrolled in each of its four disciplines. So, if you are interested in Civil, Electrical, Mechanical, or Metallurgical Engineering, join others with similar interests here at The University of Texas at El Paso.

SCHOOL OF ENGINEERING

CIVIL ENGINEERING

HERBERT H. BARTEL, JR., *Chairman*

Professors APPLGATE, BARTEL, HASSLER, HENDERSON;

Associate Professors COLTHARP, OEY, ROZENDAL, YOUNG;

Assistant Professor TARQUIN.

(See page 47 for Degree Plan)

For Undergraduates

General prerequisite: Junior standing for all 300 or 400 level courses.

- 1103 Scientific and Engineering Analysis (1-0)**
A general introduction to the fields of Civil Engineering; the tools of the Civil Engineer; and a preparation for the study of Civil Engineering.
- 1104 Introduction to Environmental Pollution (0-3)**
An introduction to the basic principles of air, water and solid waste pollution. Groups of pollutants, their effects and control measures will be covered.
- 3170 Honors Seminar (3-0)**
Selected topics in Engineering or individual research for qualified freshman students. *Prerequisite:* Permission of Instructor.
- 3201 Pollution and Natural Resources (3-2)**
Study of man's environment and its demands upon our resources. Emphasis will be on pollutants and their effect upon air, water and food resources. Open to all students.
- 2202 Engineering Problem Analysis (1-3)**
Studies to include the techniques and tools of problem analysis. *Prerequisite:* Mathematics 4111 and 3212.
- 3213 Engineering Measurements (2-3) Summer work (5 Lec. — 18 Lab per wk.)**
Theory and practice of surveying measurements with emphasis on precision, errors and significant figures. Theory of simple curves, reverse, compound and vertical; also spirals and earthwork. *Prerequisite:* Mathematics 4111 and Mechanical Engineering 2103 or 3103, and a knowledge of Fortran.
- 3214 Field Surveying (1-6)**
Practical application of the topics covered in CE 3213. *Prerequisite:* CE 3213.
- 3215 Engineering Mechanics I (3-0)**
Forces in space, equilibrium of particles and rigid bodies, friction, centroids, centers of gravity. *Prerequisite:* Mathematics 3212 concurrently.
- 3234 Mechanics of Materials I (3-0)**
Study of stress, strain, torsion, shear, moment, flexure, combined stresses and column action. *Prerequisite:* Civil Engineering 3215.
- 1236 Engineering Materials Laboratory (0-3)**
Laboratory practice in the manufacture and testing of concrete, steel, wood, and plastic specimens; instrumentation work in the measurement of stresses and strains. *Prerequisite:* CE 3234.
- 3238 Engineering Mechanics II (3-0)**
Principles of dynamics and their application to engineering problems; work and energy, impulse and momentum and kinetics and kinematics of particles and rigid bodies. *Prerequisite:* Civil Engineering 3215.
- 3326 Engineering Economy (3-0)**
Application of economics to engineering and industrial problems which require a knowledge of engineering for their solution. *Prerequisite:* Junior standing a knowledge of Fortran, or approval of instructor.

- 3343 Structural Analysis I (3-0)**
A study of framed structures, trusses, girders, beams including applications of static and moving loads and bridges. *Prerequisite:* Civil Engineering 3234.
- 3490 Introduction to Air Pollution (3-3)**
Classification of air pollutants and their effects on man, animals, plants and the environment; meteorological aspects of air pollution; sources of air pollution; plume characteristics; units of measurement; physical properties of dusts, gases, and aerosols. *Prerequisite:* Junior standing in Engineering or Sciences and approval of instructor.
- 2396 Air Pollution Laboratory (1-3)**
Sampling and analytical technique; atmospheric sampling equipment for dusts, aerosols, and gases; meteorological instruments; quantitative field measurements of air pollutants; air quality survey. *Prerequisite:* Junior standing in Engineering or Science and approval of instructor.
- 3435 Structural Design I (3-0)**
Reinforced concrete theory; design of beams, columns, slabs, footings and retaining walls using current design specifications. *Prerequisite:* CE 3343.
- 3404 Meteorology (3-0)**
Study of the fundamentals of modern meteorology. Includes the following topics: physical elements which cause and influence weather, forecasting, meteorological instrumentation, weather data and charts.
- 3440 Transportation Engineering (3-0)**
Study of planning, economics, finance, location, design and administration of transportation systems. *Prerequisite:* CE 3213 and 3448 or concurrent enrollment.
- 3441 Water Treatment and Analysis (3-0)**
Principles of water treatment and its application to the design and operation of municipal and industrial water treatment plants. *Prerequisite:* Chemistry 3105, CE 1104, and ME 4354.
- 3442 Waste Treatment and Analysis (3-0)**
Principles of waste treatment and disposal and its application to the design and operation of waste treatment plants. *Prerequisite:* Chemistry 3105, CE 1104, and ME 4354.
- 3446 Engineering Law (3-0)**
A study of the law of contracts, sales, negotiable instruments, insurance, property, torts, agency and business organizations. *Prerequisite:* Senior standing in engineering and permission of the instructor.
- 3448 Soil Mechanics (2-3)**
Physical and mechanical properties of soils; specific gravity, grain size distribution, plasticity, shrinkage, permeability, compressibility, consolidation and shear. *Prerequisite:* Civil Engineering 3234, Mechanical Engineering 4354, and Geology 3321.
- 3449 Foundation Engineering (3-0)**
Study of properties of subsurface materials, exploration methods, durability of construction materials used in foundations, construction methods and types of foundations, selection of foundations and basis for design. *Prerequisite:* CE 3448.
- 3450 Engineering Hydrology (3-0)**
Study of the hydrologic cycle, precipitation, flood frequency, storm characteristics, net rain, surface drainage, and flood runoff. *Prerequisite:* Senior standing and permission of instructor.
- 3451 Public Health Engineering (3-0)**
Principles of public health and the application of engineering methods to public health. *Prerequisite:* Senior standing in engineering or science.
- 3452 Civil Engineering Systems Analysis (3-0)**
Study of contemporary tools in the mathematical formulations and solutions of Civil Engineering Systems. *Prerequisite:* Senior standing in engineering or science.

School of Engineering

- 1453 Water and Waste Laboratory (0-3)**
Laboratory analysis of water and wastes. *Prerequisite:* Concurrent enrollment in CE 3441 or 3442.
- 4460 Structural Analysis II (3-3)**
Analysis of statically indeterminate structures including continuous beams and frames. *Prerequisite:* Civil Engineering 3343 and Senior standing.
- 3461 Structural Design II (3-0)**
Design of steel structures including the application of plastic design methods using current design specifications. *Prerequisite:* CE 3343.
- 4456 Hydraulic Engineering (3-3)**
Principles of hydrology and hydraulics applied to the design of hydraulic projects. *Prerequisite:* Mechanical Engineering 4354.
- 4470 Mechanics of Materials II (3-3)**
Analysis of problems dealing with energy methods, curved bars, torsion of non-circular sections, fatigue, stress concentration, stress and strain, and experimental methods of stress determination. *Prerequisite:* Civil Engineering 3234 and Senior standing.
- 1471-3471 Engineering Problems — Seminar (3-0)**
Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. *Prerequisite:* Senior standing and consent of the head of the department. Can be repeated for credit.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Engineering and a Bachelor's Degree.

- 4501 Free Surface Flow (3-0)**
Open channel hydraulics: Energy concepts, resistance, transitions, spillways, energy dissipation, solutions of gradually varied flow, stable channels, steep channels, steady and unsteady flow conditions. *Prerequisite:* Mechanical Engineering 4354 or approval of instructor.
- 3502 Ground Water Hydrology (3-0)**
Flow of ground water in isotropic and anisotropic media: Flow nets, hydraulics of wells, basin-wide development, safe yield, quality, recharge, salt-water intrusion and dispersion of wells. *Prerequisite:* Approval of instructor.
- 4505 Advanced Structural Analysis (3-3)**
Theory of finite element approximation, numerical solutions of a variety of problems in structural mechanics including beam-columns, grid beams and plates on linear and nonlinear foundations; matrix structural analysis. May be repeated for credit. *Prerequisites:* Civil Engineering 3343 or approval of instructor.
- 3506 Advanced Soil Mechanics (3-0)**
Application of soil mechanics to stability of slopes, retaining walls, and foundations, frost action in soil. Introduction to seepage. *Prerequisite:* Approval of instructor.
- 4507 Aerial Photographic Interpretation (3-3)**
A study of the applications of the science of aerial photographic interpretations as it pertains to the field of engineering, including the recognition of soil types and classes, engineering materials surveys, route location, and the delineation of watersheds and estimates of runoff and seepage. *Prerequisite:* Approval of instructor.
- 4508 Bioengineering Processes (3-3)**
Description of biochemical processes involved in complex pollution problems. Energetics of aerobic and anaerobic processes, enzymes, metabolic reactions, synthesis, and theory of biological waste treatment. May be repeated for credit. *Prerequisite:* Approval of instructor.

School of Engineering

- 4509 Analysis of Water and Wastes (2-6)**
Analysis of physical, chemical, and biological properties of water and wastes; evaluation of processes involved in complex pollution problems. *Prerequisite:* Approval of instructor.
- 3512 Plastic Design of Structures (3-0)**
Fundamental principles of plastic design, plastic hinges, method of analysis of structures for ultimate load. Plastic design for axial and shearing forces. Stability problems in plastic design. Design of continuous structures. *Prerequisite:* Civil Engineering 3461 or approval of instructor.
- 4516 Radiological Health Engineering (3-3)**
Principles of Radiological Health. Analysis of radiation hazards; ionizing effects of radiation; principles of detection, etc. *Prerequisite:* Approval of instructor.
- 3517 Similitude and Statistical Methods (3-0)**
Dimension and model theory and its use in analyzing physical experiments. Applications of probability and statistical analysis. *Prerequisite:* Approval of instructor.
- 4518 Photogrammetry (3-3)**
Theory and applications of engineering measurements by aerial photogrammetry. *Prerequisite:* Approval of instructor.
- 3520 Advanced Soil Mechanics II (3-0)**
Physical and mechanical properties of soils; specific gravity, grain size distribution, plasticity, shrinkage, permeability, compressibility, consolidation and shear. *Prerequisite:* C.E. 3234, ME 4354, and C.E. 3448.
- 3521 Industrial Hygiene and Toxicology**
Techniques of industrial toxicology; mechanisms by which toxic gases, vapors, and dusts produce disease in experimental animals and in man. *Prerequisite:* Consent of the instructor.
- 4522 Advanced Waste Treatment (3-3)**
Advanced problems relating to the treatment of water, sewage, industrial and radioactive wastes. *Prerequisite:* CE 3442 and approval of instructor.
- 3524 Stream Pollution (3-0)**
Kinetics and mechanisms of stream pollution: growth and decay, the oxygen balance, and stream microbiology. *Prerequisite:* Approval of instructor.
- 3525 Design of Structures for Dynamic Loads (3-3)**
Behavior of structural members under dynamic loads. Vibration theory, particular reference to structures; design of structural systems to dynamic loads, wind loads, and earthquakes. *Prerequisite:* Approval of instructor.
- 3526 Air Pollution Control (3-0)**
Effects of air pollution, classification of wastes, meteorological factors; sampling and analysis; abatement; statistical analysis.
- 4527 Contemporary Topics in Surveying (3-3)**
Selected topics of current interest in modern surveying. May be repeated for credit when topic varies. *Prerequisite:* Approval of instructor.
- 3528 Contemporary Topics in Urban Engineering (3-0)**
Selected topics of current interest in urban engineering. May be repeated for credit when topic varies. *Prerequisite:* Approval of instructor.
- 3529 Contemporary Topics in Structures (3-0)**
Selected topics of current interests in structural engineering. May be repeated for credit when topic varies. *Prerequisite:* Approval of instructor.
- 3530 Regional Development of Water Resources (3-0)**
Allocation of water resources to optimize benefits and conservation on a regional basis. Interactions between quantity, quality, and type of use. *Prerequisite:* Approval of instructor.

- 3531 Contemporary Topics in Water/Air Resources (3-0)**
Selected topics of current interest in urban engineering. May be repeated for credit when topic varies. *Prerequisite:* Approval of instructor.
- 4532 Modern Methods of Engineering Computations (3-3)**
Methods of iterations, approximations, and numerical procedures used in solution of complex problems and optimizations such as occur in Engineering Design and Scientific Analysis. *Prerequisite:* Approval of instructor.
- 3533 Plates and Shells (3-3)**
The theory and design of plates and shell structures by the membrane and bending stress theories. *Prerequisite:* Approval of instructor.
- 1595-3595 Graduate Seminar (3-0)**
Conferences, discussions and/or research, individual or collective, on advanced phases of engineering problems conducted under the direct supervision of a faculty member. Variable credit, and may be repeated for credit to total six credits. *Prerequisite:* Approval of the instructor.
- 3596-99 Thesis Course for the Master's Degree**

ELECTRICAL ENGINEERING

J. O. KOPPLIN, *Chairman*

Professor Emeritus CLYDE R. NICHOLS

Professors AUSTIN, KOPPLIN, LAMBERT; *Adjunct Professors* DRUMMOND, Holt; *Associate Professors* GIBSON, PIERLUISSI, SMITH; *Assistant Professors* LIU, McDONALD, SCHRODER, TAYLOR; *Instructor* IZQUIERDO

(See page 47 for Degree Plan)

For Undergraduates

General prerequisite: Junior standing for all 300 or 400 level courses.

- 3105 Introduction to Engineering Technology (3-0)**
A study of the Man Made World with an emphasis on information systems and how they are developed and their effect upon society. Includes an introduction to decision making, modeling, feedback, and logical design. An introductory course open to all students.
- 1209 Basic Electrical Engineering Laboratory**
Basic laboratory study of the digital computer in network theory, the analog computer and its components, and basic laboratory procedures and instrument usage. *Prerequisite:* EE 3251 or concurrently and EE 3220.
- 3220 Introduction to Engineering Computation (2-3)**
A study of the Fortran language with applications to Electrical Engineering problems. Computer organization and basic numerical methods. *Prerequisite:* Mathematics 3212 or concurrently.
- 3251 Networks I (3-0)**
Theory and analysis of electrical networks including basic fields and circuits concepts, Kirchoff's laws, mesh and nodal analysis, classical and Laplace transform solutions of network equations, and an introduction to the sinusoidal steady state. *Prerequisite:* Mathematics 3326 or concurrently and Civil Engineering 3202.
- 4277 Basic Electrical Engineering (3-3)**
Principles of electric circuits, transformers, generators and motors, including motor applications with the protection and static and automatic feedback control thereof. Not intended for Electrical Engineering majors. *Prerequisite:* Sophomore standing.
- 4278 Electronics for Engineers and Scientists (3-3)**
Measuring, recording, processing, and interpreting electrical signals produced by various types of transducers. Emphasis on measurement of non-electrical quantities by electronic instrumentation. Not intended for Electrical Engineering majors. *Prerequisite:* Sophomore standing.
- 2310 Electrical Engineering Laboratory I (1-4)**
Introduction to experimentation and basic laboratory procedures including the measurement of electrical quantities and the use of basic electrical and electronic laboratory instruments. *Prerequisite:* Electrical Engineering 3251.
- 2311 Electrical Engineering Laboratory II (1-4)**
Measurement theory, statistics of experimental measurements, experimental data analysis, experiment design, and the laboratory investigation of various electrical devices and systems. *Prerequisite:* Electrical Engineering 2310.
- 3321 Electromagnetic Field Theory (3-0)**
Fundamentals of static electric and magnetic fields, time-varying fields and Maxwell's equations, motion of charged particles in electromagnetic fields. *Prerequisites:* Electrical Engineering 3251.

- 3339 Electronics I (3-0)**
Electronic properties of materials, terminal characteristics of semiconductor and vacuum tube devices, graphical methods, two-port network analysis, small-signal equivalent circuits, frequency response methods, root-locus analysis. *Prerequisite:* Electrical Engineering 3251 and Mathematics 3326.
- 3340 Electronics II (3-0)**
Application of the concepts and methods developed in Electronics I to large- and small-signal tuned amplifiers and broad-band amplifiers. Concepts of wave-shaping, waveform generation, and switching are developed. *Prerequisite:* Electrical Engineering 3339 or Physics 4339 and permission of the instructor.
- 3352 Networks II (3-0)**
Continuation of theory and analysis of electrical networks. Includes sinusoidal steady state analysis, frequency plots, Fourier analysis, network theorems, two-port networks, and state-space application to networks. *Prerequisite:* Electrical Engineering 3251.

For Undergraduates and Graduates

Prerequisite for graduate credit: At least twelve semester hours of undergraduate credit in Engineering.

- 2412 Senior Project Laboratory (1-4)**
Laboratory development of special projects concerned with various electrical systems. Small group or individual semester projects are stressed. *Prerequisite:* Electrical Engineering 2311.
- 3441 Communication Systems (3-0)**
Advanced topics in communications, including frequency analysis of signals, modulation, noise, information transmission, and statistical methods in system analysis. *Prerequisite:* Electrical Engineering 3340.
- 3442 Solid State Device Applications (2-3)**
Application of solid-state electronics in circuits and systems. Emphasis on the design of analog and digital integrated circuits. *Prerequisite:* Electrical Engineering 3340.
- 3447 Electromagnetic Energy Transmission and Radiation (3-0)**
Derivation and application of the general transmission-line equations, propagation and reflection of plane waves, analysis of waveguide transmission systems, electromagnetic radiation and simple antenna systems. *Prerequisite:* Electrical Engineering 3321.
- 3464 Systems and Controls (3-0)**
Continuous systems: transfer functions, characteristics, stability, methods of design. Discrete systems: z-transforms, relation to continuous systems, characteristics, stability and methods of design. *Prerequisite:* CE 3238 and EE 3352.
- 3465 Modeling and Simulation (2-3)**
Theory and application of analog computers, mathematical modeling of physical systems, application of control theory to electrical, hydraulic, and electro-mechanical systems, analog and digital computer simulation, student project. *Prerequisite:* Electrical Engineering 3464 or concurrently.
- 3469 Switching Theory and Logical Design (3-0)**
Analysis and synthesis of combinational and sequential switching circuits. Topics include map and tabular minimization of combinational circuits, multiple-output circuits, incompletely specified functions, pulse mode and fundamental mode sequential circuits. Emphasis is on logical circuit design. *Prerequisite:* Senior standing in engineering or permission of the instructor.
- 1471-3471 Engineering Problems — Seminar (1, 2, 3-0)**
Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. *Prerequisite:* Senior standing or consent of the head of the department. May be repeated for credit.

3472 Digital Computers (3-0)

Topics include numbers systems, basic coding techniques, Boolean algebra and algebraic minimization of Boolean functions, analysis and synthesis of basic circuits, typical organization of a digital computer and the basic principles of simboolical language programming. *Prerequisite:* Senior standing in engineering or permission of the instructor.

3475 Numerical Methods for Electrical Engineers (3-0)

A study of the numerical techniques used in solving problems in electrical engineering. Numerical integration, matrix inversion, and solution of ordinary differential equations are considered via application to signal, system, and network analysis. *Prerequisite:* Mathematics 3326, basic knowledge of Fortran, or permission of the instructor.

3480 Microwave Communications (3-0)

Primarily a terminal undergraduate course concerning high frequency energy generation and transmission. Topics include microwave oscillators, principles of solid state microwave devices, propagation of radio waves in the atmosphere and the ionosphere, and atmospheric absorption of radio wave energy. *Prerequisite:* Electrical Engineering 3447 or equivalent.

3482 Antenna Engineering (3-0)

A broad introduction to antenna engineering with emphasis on design principles and applications, includes radiation fundamentals as used in modern array systems, reflectors and frequency independent antennas, together with the associated measurements of their characteristics. *Prerequisite:* EE 3447 or concurrently.

3484 Probabilistic Methods in Engineering and Science (3-0)

Problems involving discrete and continuous random variables, distribution functions, moments, and statistical dependence. Emphasis to be on formulation of physical problems. *Prerequisite:* Senior standing in engineering or permission of the instructor.

3485 Energy Conversion (3-0)

Theory and performance characteristics of electro-mechanical energy conversion equipment to include transformers and both d-c and a-c generators and motors and the control devices employed therewith. *Prerequisite:* Electrical Engineering 3352.

3486 Power System Analysis (3-0)

A study of the characteristics of transmission lines and their current and voltage relations; generalized circuit constants; representations of power systems; load flow studies; faults on lines and machines; and stability problems. *Prerequisite:* Electrical Engineering 3485 or permission of instructor.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Engineering and a Bachelor's Degree.

3501 Operational Methods of Circuit Analysis (3-0)

Elements of functions of a complex variable, followed by application of Fourier and Laplace transform techniques to the problems of signal transmission through lumped and distributed parameter systems.

3504 Information Theory (3-0)

Encoding, transmission, and decoding of messages; information content, information gain, channel capacity, and entropy; coding theorems. *Prerequisite:* Electrical Engineering 3484 or consent of instructor.

3505 Wave Propagation (3-0)

Theoretical treatment of waves in electromagnetics, acoustics, and hydromagnetics. Special attention to both ray and mode theory of propagation when medium is inhomogeneous and anisotropic. *Prerequisite:* Electrical Engineering 3447 or consent of the instructor.

- 3506 Antenna Theory (3-0)**
Fundamental theory of point sources; the antenna as an aperture; methods of analyzing and calculating characteristics of various types of antennas; self and mutual impedances of antennas; array of linear antennas; antenna measurement technique. *Prerequisite:* Electrical Engineering 3447 or consent of the instructor.
- 3507 Modern Control Theory (3-0)**
State Space techniques (continuous case); controllability and observability, Lyapunov's second method; Pontryagin's principle, the principle of optimality and dynamic programming; the method of steepest descent; and other optimization techniques. *Prerequisite:* Electrical Engineering 3464 or consent of the instructor.
- 3509 Network Analysis and Synthesis I (3-0)**
Advanced treatment of linear passive network theory with primary emphasis upon synthesis aspects; application to design of networks for prescribed driving-point and transfer characteristics; fundamental work of Foster, Cauer, Brune, and Darlington.
- 3511 Physical Electronics (3-0)**
Fundamental electronic processes in solids, liquids, and gases; statistical mechanics and introductory quantum mechanics; gaseous and plasma electronics.
- 3512 Solid State Electronics (3-0)**
Free electron theory of metals including thermoelectric and thermomagnetic effects; band theory of solids. Magnetic and dielectrical properties of materials; theoretical analysis of solid state devices. *Prerequisite:* Electrical Engineering 3511 or consent of instructor.
- 3513 Principles of Pulse Circuits (3-0)**
Analysis and design of overdriven circuits, multivibrators, blocking oscillators, and other high-speed circuits. Piecewise-linear and other approximations useful in non-linear analysis. *Prerequisite:* Electrical Engineering 3340 or consent of the instructor.
- 3514 Advanced Topics in Electrical Engineering**
A course covering one or more advanced topics in electrical engineering. The subjects will vary from year to year and may be selected, for example, from one of the following fields: nonlinear system analysis; analog and digital computing systems and components; systems engineering; applications of new types of magnetic, dielectric and semiconductor materials to engineering devices; pulse systems and techniques. May be repeated for credit.
- 3515 Advanced Electromagnetic Theory (3-0)**
Theorems and concepts of uniqueness, equivalence, induction, reciprocity and Green's functions. Application of plane, cylindrical, and spherical wave functions to resonators, waveguide, radiators, apertures, and scattering. *Prerequisite:* Electrical Engineering 3447 or consent of the instructor.
- 3516 Symmetrical Components (3-0)**
A study of the principles of symmetrical components and their application to the solution of problems involving unbalanced conditions in electrical machines and systems.
- 3517 Power System Economics (3-0)**
Amortization, fixed charges, distribution factors, allocation, loss evaluation, economic loading and control of economic performance, economic selection, and rate structures.
- 3518 Power Systems Analysis I (3-0)**
Equivalent circuits and characteristics of multi-winding transformers, grounding and mutual coupling. Load flow studies. Analysis of balanced and unbalanced conditions in multiphase systems. Sequence impedances of equipment. *Prerequisite:* Electrical Engineering 3516.
- 3519 Power System Analysis II (3-0)**
Problems relating to power limits; steady-state stability; acceleration equations, and transient stability. Methods of improving stability. *Prerequisite:* Electrical Engineering 3517.

- 3523 Random Processes in Physical Systems (3-0)**
General concepts of stochastic processes, correlation and power spectra, optimum filter techniques, normal random processes, statistical estimation. *Prerequisite:* Electrical Engineering 3484 or consent of the instructor.
- 3524 Statistical Communication Theory (3-0)**
Measurement problems, modulation by random processes, detection of signals and estimation of signal parameters. *Prerequisite:* Electrical Engineering 3523.
- 3525 Modern Electronics (3-0)**
Recent developments in electronics such as integrated circuits, thin film techniques, FET's, SCR's miniature operational amplifiers, unijunction transistors, tunnel and Zener diodes and other recently developed electronic devices with emphasis on latest applications; design and analysis of circuits using solid state devices. *Prerequisites:* Electrical Engineering 3340 and Electrical Engineering 3352.
- 3527 Modern Control Theory II (3-0)**
Properties of optimal systems; the minimum time, minimum fuel, and minimum energy problems; and application of optimization techniques to system design. *Prerequisite:* Electrical Engineering 3507.
- 3531 Linear Programming and Game Theory (3-0)**
Linear models, solution of linear models using simplex method, integral linear programming, two person games, relation between matrix games and linear programming, solution of matrix games. *Prerequisite:* Mathematics 3323 or consent of instructor.
- 3532 Non-linear and Dynamic Programming (3-0)**
La Grange multiplier, Kuhn-Tucker theory, gradient methods, quadratic programming, other selected topics in non-linear programming, Principle of Optimality, functional equations, dynamic programming methods. *Prerequisite:* Electrical Engineering 3531 or consent of instructor.
- 3533 Operations Research (3-0)**
Advanced topics in operations research. To include simulation and modeling, queuing theory, inventory theory, and applications of these theories as well as applications of mathematical programming and game theory. *Prerequisite:* EE 3531 or concurrently.
- 3541 Atmospheric Infrared Radiation (3-0)**
The fundamental theory of atmospheric radiation including thermal laws, radiation transfer, molecular absorption, band-models, spectroscopy and scattering, with particular emphasis on the infrared electromagnetic region. Application to satellite measurements are covered by referring to the recent literature. *Prerequisite:* Electrical Engineering 3447 or consent of instructor.
- 3543 Microwave Engineering (3-0)**
An introduction to the fundamentals of microwave engineering topics includes waveguide transmission, impedance transformation and matching, passive microwave elements, resonant cavities, microwave networks and periodic structures. *Prerequisite:* EE 3447 or consent of instructor.
- 3582 Environmental Diagnostics by Radiowaves (3-0)**
A study of environmental effects on radio wave propagation. Topics include electron-layer production, the geomagnetic field, magneto-ionic theory, frequency predictions and scattering of radio waves from ionized media. *Prerequisite:* EE 3447 or consent of instructor.
- 1595-3595 Graduate Seminar (1, 2, 3-0)**
Conferences, discussions and/or research, individual or collective, on advanced phases of engineering problems conducted under the direct supervision of a faculty member. Variable credit, and may be repeated for credit to total 6 credits. *Prerequisite:* Permission of the instructor.
- 3598-99 Thesis Course for the Master's Degree**

MECHANICAL ENGINEERING

JOHN M. LEVOSKY, *Chairman**Professors* COLEMAN, EDWARDS, LEVOSKY, WHITACRE;*Associate Professors* BHADURI, DOWDY, FILLO;*Assistant Professors* BACON, BLANK, CRAVER.

(See pages 48 & 49 for Degree Plans)

For Undergraduates*General prerequisite:* Junior standing for all 300 or 400 level courses.

- 3103 Graphical Fundamentals in Engineering Design (2-4)**
Freehand projection, fundamentals of multiview projections, auxiliaries, sections, detailed drawings, dimensioning and pictorials. Preliminary investigation of elementary engineering design problems.
- 3104 Freshman Design (2-3)**
Role of the engineer; engineering problems solutions; engineering design methods; elementary digital computer programming; design project.
- 3205 Basic Measurements and Instrumentation (2-3)**
The theory and fundamentals of physical measurements, study of characteristics of dynamic signals, study of basic detector-transducer elements and applied mechanical measurements. *Prerequisite:* Ma 3217 or concurrently.
- 3236 Manufacturing Processes (3-0)**
Theory and practice of production as a system; power, material, choice of process. *Prerequisite:* Ma. 3217 or concurrently.
- 3275 Thermodynamics I (3-0)**
Principles of thermodynamics of single and multi-phase systems of pure substances. *Prerequisite:* Ma. 3212.
- 4351 Heat Transfer (3-3)**
Introduction to heat transfer by conduction, convection and radiation; steady and transient states, steady periodic states. Heat transfer in engineering apparatus; graphical and numerical methods; electrical and fluid analogies. *Prerequisite:* ME 3275 and ME 4354.
- 4354 Fluid Mechanics (3-3)**
Fluid properties and definitions, fluid statics, fluid flow concepts and basic equations, ideal fluid flow, dimensional analysis and dynamic similitude, viscous effects: fluid resistance, introduction to laminar and turbulent boundary layers, flow through pipes and open channels, compressible flow, fluid measurement and control. *Prerequisite:* ME 3275, Ma 3326.
- 3363 Kinematics of Mechanisms (2-3)**
Analysis of displacement, velocity and acceleration in basic mechanisms for control, transmission and conversion of motion and force. *Prerequisite:* CE 3238.
- 3367 Dynamics of Machinery (3-0)**
Kinetics, equations of motion, critical speeds and balancing, forces in machines, three dimensional rotation, mechanism synthesis. *Prerequisite:* ME 3363.
- 3376 Thermodynamics II (3-0)**
Continuation of ME 3275. Application of principles to cycles and reactive systems; energy relationships and equilibrium requirements. *Prerequisite:* ME 3275.
- 3377 Work Measurements (2-3)**
Methods used in the development of procedures for the effective utilization of manpower in industry. *Prerequisite:* Junior standing in engineering or permission of instructor.

For Undergraduates and Graduates*Prerequisite for graduate credit:* At least twelve semester hours of undergraduate credit in Engineering.

- 3412 Fluid Power and Control Systems (3-0)**
Fundamentals of fluid power system design; fluid power transmissions; basic circuit and control components; fluid power circuits and circuit design. *Prerequisite:* M.E. 4354 or consent of instructor.

School of Engineering

- 3441 Engineering Analysis (3-0)**
Application of mathematical principles to the analysis of engineering problems; emphasis on analytical description of the system, use of vector algebra, differential and integral calculus, complex variables, graphical and numerical methods. *Prerequisite:* Ma 3326.
- 3455 Gas Dynamics (3-0)**
A study of the flow of compressible fluids. One dimensional steady flow, supersonic flow, normal and oblique shock, and flow with heating and cooling; measurement of fluid properties and flow parameters. *Prerequisite:* ME 4354 and 3376.
- 3464 Senior Analysis (2-3)**
The application of mechanics, materials science and probability theory in the analysis of members within practical limitations of dimensions, cost, etc.; photo-elastic and strain gage approaches to stress analysis. *Prerequisite:* CE 3234.
- 4465 Dynamic Response (3-3)**
Fundamentals of vibration theory and system response. Single and multiple degrees of freedom, damping, isolation. *Prerequisite:* Ma 3326, CE 3238.
- 4466 Senior Design (2-6)**
Feasibility studies, preliminary and detailed design projects furnished by industry handled on a team basis and usually terminating in working models. *Prerequisite:* Senior standing or permission of instructor.
- 3471 Engineering Problems — Seminar (0-9)**
Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. *Prerequisite:* Senior standing and consent of the head of the department. May be repeated for credit.
- 3484 Industrial Layout (2-3)**
The design, selection and layout of buildings and equipment for proper utilization in manufacturing. *Prerequisite:* Senior standing in engineering or permission of instructor.
- 3485 Statistical Quality Control (3-0)**
The statistical design of systems for prescribed quality levels and prevention of defects. *Prerequisite:* Ma 3330 or equivalent.
- 3486 Human Factors in Engineering (3-0)**
Consideration of human factors in evaluating the elements of engineering design.
- 3487 Aerodynamics (3-0)**
Introduction to the aerodynamics of flight vehicles. One dimensional flow of a perfect gas, shock and expansion waves, converging-diverging nozzles; subsonic, supersonic, and hypersonic flows. Evaluation of aerodynamic loads on flight vehicles, including aerodynamics and characteristics of various types of power plants for a wide range of Mach numbers. *Prerequisite:* Mechanical Engineering 4354 and Mechanical Engineering 3376 or permission.
- 3488 Aerospace Structures (3-0)**
Analysis of thin skin structures, box-beam theory, shear flow, shear center, unsymmetrical beam loading. *Prerequisite:* CE 3234.
- 3489 Fundamentals of Optimization (3-0)**
Matrix theory, linear and dynamic programming, queuing theory, learning curves. *Prerequisite:* Senior standing or consent of the instructor.
- 3490 Turbomachinery (3-0)**
Thermodynamics of fluid through turbomachines; systems characteristics of turbines, compressors, pumps, blowers, fluid couplings and fluid torque converters; dynamic similitude in pumps, compressors and turbines; cavitation problems in hydraulic machinery. *Prerequisite:* Senior standing and permission of instructor.
- 3491 Noise Control (3-0)**
Wave equations, microphones, frequency analysis, psycho-acoustics, noise pollution and control. *Prerequisite:* Senior standing and permission of instructor.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Engineering and a Bachelor's Degree.

- 3501 Experimental Stress Analysis (2-3)**
Modern techniques for determining state of stress and strain experimentally. The laboratory provides the opportunity to gain practice in the use of these devices and their ancillary equipment. *Prerequisite:* Civil Engineering 3234 or consent of the instructor.
- 3502 Advanced Mechanics of Materials I (3-0)**
Elastic strain energy, theories of failure, beams on continuous elastic supports, thick-walled cylinders, laminated cylinders, autofrettage. *Prerequisite:* CE 3234 or consent of the instructor.
- 3503 Advanced Heat Transfer I — Conduction (3-0)**
Conduction in various coordinate systems: steady and transient-state cases with various boundary conditions; analytical, numerical and graphical solutions. Prerequisite: Mathematics 3326 or consent of the instructor.
- 3504 Advanced Heat Transfer II — Convection and Radiation (3-0)**
Thermal boundary-layer theory; forced convection in laminar and turbulent flows; free convection. Thermal radiation; emissivity and absorptivity of materials; geometric factors. *Prerequisite:* Mechanical Engineering 4354 or consent of the instructor.
- 3506 Advanced Fluid Mechanics I (3-0)**
Survey of the principal concepts of fluid mechanics, statics, continuity, momentum and energy relations for continuum fluids, kinematics of fluid motion, governing equations for motion of non-viscous fluid, vorticity and circulation, Kelvin's theorem, Helmholtz theorem, Crocco's theorem, stream function, potential flow, conformal transformation, theory of lift, wave phenomena in fluids. *Prerequisite:* Mechanical Engineering 4354 or consent of the instructor.
- 3507 Advanced Fluid Mechanics II (3-0)**
Viscous and turbulent flows. Viscosity and dissipation phenomena, the Navier-Stokes and energy equations; creep flow at low Reynolds numbers, laminar boundary layers, laminar stability, transition and turbulence, turbulent boundary layers, jets, wakes, and separated flows, thermal boundary layers, compressible boundary layers, dissociation and ionization. *Prerequisite:* Mechanical Engineering 4354 or consent of the instructor.
- 4508 Advanced Mechanical Design (3-3)**
Study of the method of optimum design for mechanical systems. Evolution of optimum design, approximation for explicit design: Mathematical functions in design, evaluation of the effects of manufacturing errors on product performance, optimum choice for method of analysis, statistical consideration for factor of safety; adequate design, optimum design, design equations; normal redundant and incompatible specifications; loose limits and loose specifications; problems with more than one primary design equation.
- 3509 Structural Dynamics (3-0)**
Continuation of Mechanical Engineering 4365 with emphasis on multiple-degree-of-freedom systems and their response to disturbances. Normal mode theory, matrix representation of problem; Laplace transform, electrical analogue and mobility techniques of solution. Vibration measurements and analysis. *Prerequisite:* Mechanical Engineering 4365 or consent of the instructor.
- 3510 Advanced Thermodynamics (3-0)**
General thermodynamic relations, equations of state, advanced treatment of second law, equilibrium availability and selected topics. Prerequisite: Mechanical Engineering 3376 or consent of the instructor.

School of Engineering

- 3511 Environmental Engineering (3-0)**
Thermal and humidity load analysis. Human comfort and tolerances. Environmental control methods: heating, refrigeration, humidification and drying; atmosphere and pollution control. System component characteristics; system analysis and design. Automatic controls. *Prerequisite:* Mechanical Engineering 3376 or consent of the instructor.
- 3512 Analysis of Multivariable Processes (3-0)**
Study of the mathematical structures and couplings describing the dynamics of observable processes using vector space methods with geometrical interpretations. Mapping of vector equations into corresponding matrix equations. Description of process changes by transformation matrices. Identification of process parameters and observable vectors in changing reference frames in the presence of measurement uncertainties. *Prerequisite:* Consent of the instructor.
- 3513 Advanced Fluid Mechanics III (3-0)**
Compressible flow, energy, continuity and momentum principles applied to compressible fluid flows, one, two, and three dimensional subsonic, supersonic and hypersonic flow, normal and oblique shocks, method of characteristics, mixed flows: hodograph method, compressible laminar and turbulent boundary layers. *Prerequisite:* ME 3455, or consent of the instructor.
- 3514 Mechanics and Thermodynamics of Propulsion (3-0)**
Thermochemistry and mechanics of combustion; viscous flow heat transfer, thermodynamics of aircraft jet engines, aerothermodynamics of internal flows; axial flow and centrifugal compressors, flow turbines; kinetics of combustion processes, equilibrium and finite-rate processes, design consideration for aircraft propulsion systems. *Prerequisite:* Consent of instructor.
- 3515 Tensor Analysis (3-0)**
Tensors as generalization of vectors; operations and transformation; tensors in differential geometry, Euclidian, Riemannian and affine spaces, Invariant theories; Cartesian tensor; stress, strain and strain-rate tensors, tensor calculus, field equations, simple constitutive equations, applications in fluid mechanics, elasticity, plasticity, electromagnetic theory, dynamics, magneto-hydrodynamics, etc. *Prerequisite:* Consent of instructor.
- 3517 Transport Phenomena (3-0)**
A unified treatment of some aspects of heat, mass, and momentum transport, rate and conversion equation, the kinetic theory explanation of molecular transport phenomena, introduction to turbulence, mass, momentum and energy transfer in laminar, turbulent and rarefied flow fields, interphase transport and macroscopic balances for multicomponent systems. *Prerequisite:* Consent of instructor.
- 3518 Advanced Dynamics (3-0)**
Velocity and acceleration analysis. Motion of a point in space. Rotating coordinate systems. Balancing of masses. Generalized coordinates. Work and Energy. Impulse and Momentum. *Prerequisite:* Civil Engineering 3238 or equivalent.
- 3519 Dynamics of Flight (3-0)**
Aerodynamic forces and moments of aircraft and missiles. Static stability and control. Equations of motion for flight vehicles.
- 3577 Thermal Systems (3-0)**
Engineering application of thermodynamics to thermal systems. Power, air conditioning, refrigeration systems; performance criteria and economic considerations. *Prerequisite:* ME 3275.
- 1595-3595 Graduate Seminar**
Conferences, discussions and/or research, individual or collective, on advanced phases of engineering problems conducted under the direct supervision of a faculty member. Variable credit, and may be repeated for credit to total 6 credits. *Prerequisite:* Permission of the instructor.
- 3598-99 Thesis Course for the Master's Degree**

METALLURGICAL ENGINEERING

D. P. KEDZIE, *Chairman**Professors* ABERNATHY, GUARD, KEDZIE, RINTELEN (Emeritus)

RIZZO, THOMAS (Emeritus);

Associate Professors EHRLINGER, ROSER.*Instructors* J. H. FORD.

(See page 50 for Degree Plans)

For Undergraduates*General prerequisite:* Junior standing for all 300 or 400 level courses.**3101 Introduction to Metallurgy I (2-3)**

An elementary course in the extraction of metal from ores, and the industrial application of metals and alloys. Open to all students.

3102 Introduction to Metallurgy II (2-3)A course in metallurgical operations including basic sampling, screening, grinding, flotation of ores; the roasting, leaching and electrolytic recovery of metals from calcines; cementation of copper mine waters and heap leaching effluents; amalgamation and cyanidation of gold and silver ores; copper, lead, and zinc refining and metallurgical plant calculations including smelter payments and metal balances. *Prerequisite:* Metallurgy 3101.**3105 Engineering Analysis (3-0)**

A study of the fundamentals of engineering principles offered on a conceptual basis including computer programming, basic statistical analysis, material and energy balance as well as field trips to metallurgical industries. An introductory course open to all students.

3106 Metallurgical Principles (3-0)A conceptual introduction to the Second Law of Thermodynamics, solid solution theory, phase equilibria and other fundamental principles of metallurgical engineering. *Prerequisite:* Metallurgy 3105.**2107 Polymer Engineering (3-0)**A study of the fundamentals of nomenclature and basic reactions of the emphasis on polymeric materials and flotation principles as they are related to Metallurgical Engineering. *Corequisite:* Chemistry 3106 and Chemistry 2106.**3203 Materials Science (3-0)**A solid state study concerned with the physical and mechanical properties of metals, plastics, and ceramics. *Prerequisite:* Metallurgy 2107 or permission of the instructor. Open to all students. Metallurgical Engineering students must simultaneously register for Metallurgy 3204.**3204 Experimental Methods in Metallurgical Engineering (0-3)**An introduction to experimentation and basic laboratory techniques including mechanical tests, microscopy, emission techniques, corrosion and emf measurements, thermal analysis and process measurements. *Prerequisite for Metallurgical Engineering students:* Metallurgy 3203. Open to all other students.**3205 Rate Phenomena in Metallurgical Engineering (3-0)**A study of rate laws, order of reactions, steady state, catalysis, rate determining steps, and the energetics and kinetics of metallurgical processes. *Prerequisite:* Metallurgy 3204.**3206 Mass and Energy Transfer (3-0)**An in depth study of the principles of mass transport and diffusion fluid flow, heat transfer and refractories. Process simulation and control and related topics will be included. *Corequisites:* Metallurgy 3205 and Math 3217.

- 3304 Process Metallurgy I (3-0)**
Application of the basic concepts and methods of metallurgical engineering to the metals process industry with an emphasis on non-ferrous processes. Typical topics are reactions in blast and reverberatory furnaces, furnace design, atmosphere: control, electrolytic processes, grinding, flotation and sintering. *Prerequisites:* Metallurgy 3206 and Math 3326.
- 3305 Process Metallurgy II (3-0)**
Application of the basic concepts and methods of metallurgical engineering to the metals process industry with an emphasis on ferrous processes. Typical topics are melting practices corresponding to the B.O.H., the open hearth, electro slag and electric methods; powder metallurgy and materials handling. *Prerequisite:* Metallurgy 3304.
- 3306 Physical Metallurgy I (3-0)**
Application of the basic concepts and methods of metallurgical engineering to physical metallurgy. Topics will include crystallography; dislocation theory; diffusion in metals and alloys; recovery, recrystallization, and grain growth and equilibrium in alloys. *Prerequisite:* Metallurgy 3206.
- 3307 Physical Metallurgy II (3-0)**
Application of the concepts and methods of metallurgical engineering to physical metallurgy. Topics will include solidification, TTT and pearlitic transformations, precipitation on hardening, martensitic reactions, gas-solid, solid-solid reactions and dispersion hardening. *Prerequisite:* Metallurgy 3306.
- 3308 Classical and Statistical Thermodynamics (3-0)**
A study of the laws of thermodynamics from the classical and statistical approach. Distributions, chemical equilibrium, direct energy conversion and other engineering applications will be included. *Corequisite:* Math 3326 or permission of instructor.
- 3309 Physics of Materials (3-0)**
A study of solid state physics applied to metals and alloys. *Prerequisite:* Metallurgy 3203 or Math 3212 and Physics 4216 and E.E. 3321 for E.E. students.
- 3401 Metal Economics (3-0)**
An advanced study of metals, products, cost and production control, and exploration and research programs. *Prerequisite:* Six semester hours of Metallurgical Engineering courses or permission of the instructor. Open to all students.
- 3402 Ferrous Process Metallurgy (3-0)**
A course in the metallurgy and fabrication of iron, steel, and related alloys. *Prerequisite:* Metallurgy 3305 or permission of the instructor.
- 4402 Mineral Dressing (3-3)**
The principles governing the process employed in the liberation and separation of the minerals and coal dressing. In the laboratory the student experiments with milling equipment and methods of concentration. *Prerequisite:* Metallurgy 3305.
- 4403 Mineral Dressing II (3-3)**
Advanced principles of ore dressing, ore testing, flowsheets, and mill design. *Prerequisite:* Metallurgy 4402 or permission of instructor.
- 3404 Electro-Metallurgy (2-3)**
The principles of electro-winning and the electro-plating of non-ferrous metals. *Prerequisite:* Metallurgy 3305 or permission of the instructor.
- 3406 Senior Project (3-0)**
A detailed study of an important current industrial problem utilizing the student's training and culminating in a formal written and/or oral engineering presentation. *Prerequisite:* Senior standing and approval of the counselor.
- 4407 Properties of Metals and Alloys (3-3)**
A study of the structure and properties of metals and alloys. The laboratory is the application of metallography and heat treatment to phase diagrams. *Prerequisite:* Metallurgy 3307.

- 3409 Corrosion (3-0)**
A study of corrosion, passivity, and protection of metals and alloys. *Prerequisite:* Metallurgy 3205 or permission of the instructor.
- 3410 Chemical Reactor Design (3-0)**
The application of thermodynamics, transport phenomena, and chemical kinetics to the design of industrial chemical reactors. *Prerequisite:* Metallurgy 3206.
- 3411 Elements of Ceramic Engineering (3-0)**
Materials, processes, thermochemical reactions, sintering and vitrification; properties and uses of ceramic engineering materials. *Prerequisite:* Metallurgy 3203.
- 4412 Spectroscopy (3-3)**
An introduction to x-ray diffraction, spectroscopy, electron microscopy and scanning electron microscopy. A detailed analysis and interpretation of results will be stressed. *Prerequisite:* Metallurgy 3307.
- 3413 Thermodynamics of Metals (3-0)**
A detailed application of the thermodynamics of metals to advanced topics in metallurgical processes. *Prerequisite:* Metallurgy 3307.
- 3415 Non-Ferrous Process Metallurgy (3-0)**
Advanced topics in the smelting and refining of non-ferrous metals. *Prerequisite:* Metallurgy 3305 or permission of the instructor.
- 4415 Mechanical Metallurgy (3-3)**
A study of elastic and plastic deformation of metals, mechanical testing, the fundamentals of metalmaking, non-destructive testing techniques and related subjects. *Prerequisite:* Metallurgy 3203 and 3204 or permission of the instructor.
- 1471-3471 Special Engineering Problems — Seminar (1, 2, 3-0)**
Original investigation of special problems in the student's field, the problem to be selected by the student with the approval of the head of the department. *Prerequisite:* Senior standing and consent of the head of the department. May be repeated for credit.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Engineering and a Bachelor's Degree.

- 4501 Advanced X-Ray Diffraction (3-3)**
Selected advanced topics in x-ray diffraction. A continuation of Metallurgy 4412. *Prerequisite:* Metallurgy 4412 or its equivalent as approved by the instructor.
- 3502 Theory of Welding and Joining (2-3)**
A study of joining of materials and the resulting Metallographic structures. *Prerequisite:* Metallurgy 4412 or its equivalent.
- 3522 Fatigue of Engineering Materials (3-0)**
Influence of repeated stress in engineering design; factors influencing fatigue properties and theories of fatigue failure. *Prerequisite:* Permission of the instructor.
- 3504 Theory of Dislocations (3-0)**
The application of dislocation theory to the structure and properties of metals. *Prerequisite:* Metallurgy 4412 and Metallurgy 4415.
- 3505 Advanced Mechanical Metallurgy (3-0)**
A solid-state approach is used to study the mechanical behavior of materials. *Prerequisite:* Metallurgy 4415 or its equivalent as approved by the instructor.
- 4506 Electron Microscopy (3-3)**
A study of the theory and application of electron microscopy. The preparation, examination, and interpretation of a variety of specimens is included. *Prerequisite:* Metallurgy 4407, 4412 or permission of the instructor.

School of Engineering

- 3526 Powder Metallurgy (3-0)**
The basic principles of metal powder compacting and theories of sintering are studied relative to solid-gas, solid-solid, and solid-liquid reactions. *Prerequisite:* Permission of the instructor.
- 3508 Electronic Properties of Materials (3-0)**
A study of those properties of materials that are based on solid-state electronic concepts. *Prerequisite:* Metallurgy 3309 or its equivalent as approved by the instructor.
- 3528 Research Topics in Metallurgical Engineering (3-0)**
Discussions of the interaction and application of theoretical, experimental, and economic factors to the solution of important engineering problems.
- 3529 Energetics in Metallurgical Engineering (3-0)**
Application of the principles of classical and statistical thermodynamics to selected topics in phase equilibria, bonding, electromotive force, and miscellaneous solid, liquid, and vapor state reactions of importance in metals, ceramics, and polymers. May be repeated as topics change. *Prerequisite:* Metallurgy 3413 or equivalent.
- 3530 Kinetics in Metallurgical Engineering (3-0)**
Application of rate theories to selected topics in diffusion, heat transfer, nucleation, phase transformations, oxidation, and other solid, liquid, and vapor state reactions of importance in metals, polymers, and ceramics. May be repeated as topics change. *Prerequisite:* Metallurgy 3206 or equivalent.
- 4509 Advanced Metallography (3-3)**
A metallurgical and metallographic study of recently developed alloys. *Prerequisites:* Metallurgy 4407 or its equivalent as approved by the instructor.
- 3512 Fracture Mechanics (3-0)**
A comprehensive study of fracture mechanics dealing with the macroscopic and microscopic elements that affect toughness and strength. *Prerequisite:* Metallurgy 4415 or 3505 or its equivalent as approved by the instructor.
- 4533-34 Engineering Ceramics I & II (3-3)**
A study of the theory of ceramic materials and their application to industrial processes. *Prerequisite:* Permission of the instructor.
- 1595-3595 Graduate Seminar**
Conferences, discussions and/or research, individual or collective, on advanced phases of engineering problems conducted under the direct supervision of a faculty member. Variable credit, and may be repeated for credit to total 6 credits. *Prerequisite:* Permission of the instructor.
- 3598-3599 Thesis Course for the Master's Degree.**



School of Liberal Arts

RAY SMALL, *Dean*

WADE J. HARTRICK, *Assistant Dean*



SCHOOL OF LIBERAL ARTS

ART

CLARKE H. GARNSEY, *Chairman*

Professors GARNSEY, MASSEY, HARRISON; Associate Professor DEPACER;
Assistant Professors ARNOLD, BISHOP, COOGLER, JANZEN; Instructor EVANS

B.A. Degree — Art courses required for a Major in Art are: Art 3101, 3102, 3103, 3104, 3105, 3106, plus three (3) 3200 number courses in one area and two (2) 3200 number courses in the other area plus additional hours to make a total of twelve (12) advanced hours in Art.

B.A. Degree with Teacher Certification (see page 53) — Art Majors are required to meet with the Department Head upon accumulating 60 semester hours credit to outline their remaining major program.

See Graduate Bulletin for courses that are approved for credit in the Master's degree programs.

The Art Department reserves the right to retain student work.

Senior candidates for the B.A. or All-Levels Degree, will be required to have a graduating exhibition.

An overall grade point average of 2.5 in the arts will be required for graduation.

Area I. Two-dimensional

- 3201 Painting I
- 3301 Painting II
- 3205 Printmaking I
- 3305 Printmaking II
- 3207 Commercial Design I
- 3307 Commercial Design II
- 3208 Life Drawing I
- 3308 Life Drawing II

Area II. Three-dimensional

- 3202 Sculpture I
- 3302 Sculpture II
- 3203 Metals I
- 3303 Metals II
- 3204 Ceramics I
- 3304 Ceramics II
- 3215 Enamels I
- 3315 Enamels II

For Undergraduates

General prerequisite: Junior standing for all 3300 or 3400 level courses.

3100 Art Appreciation

A course, with slides and text, designed to give the general university student an understanding of the great historic styles in the Arts. May be used by art majors for elective credit only.

BASIC COURSES (Required for all Art degrees)

3101 Design I (2-4)

An introduction to art through design experience with various media. Includes discussion and laboratory activity in introducing the student to the visual phenomena that form the basis for understanding and creating various art forms. Offered fall and 1st summer terms.

3103 Design II (2-4)

Continuation of Art 3101. *Prerequisite:* Art 3101 Offered spring and 2nd summer terms.

3102 Drawing I (2-4)

Introduction to various types and uses of drawing in a variety of media and subject matter. Offered fall and 1st summer terms.

3104 Drawing II (2-4)

Continuation of Art 3102. *Prerequisite:* Art 3102. Offered spring and 2nd summer terms.

For Undergraduates and Graduates

1101 Comparative Ethnic Art (1-0)

A survey of the visual arts of the black peoples, involving Africa, India the

Pacific Regions, and the influences these arts have had on the arts of the Americas. No prerequisites.

- 3100 Art Appreciation (3-0)**
A course, with slides and text, designed to give the general university student an understanding of the great historic styles in the Arts. May be used by art majors for elective credit only.
- 3105 Art History of the Western World (3-0)**
A critical and analytical study of the great historical works of art in the western world in architecture, sculpture, painting and the minor arts from the prehistoric period to the Renaissance.
- 3106 Art History of the Western World (3-0)**
A critical and analytical study of the great historical works of art in the western world in architecture, sculpture, painting and the minor arts from the Renaissance to the present.
- 3209 Contemporary Art History* (3-0)**
A course investigating in depth the causes and forms of architecture, painting, sculpture and the minor arts in the western world from 1789 to the present. *Prerequisite:* Sophomore standing.
- 3310 History of Latin American Art (3-0)**
A study of architecture, painting, sculpture and the minor arts of Latin America from 1492 to the present, with an emphasis in the arts of Mexico. *Prerequisite:* Junior standing.
- 3317 History of American Art (3-0)**
A study of the principal monuments of architecture, painting, sculpture, and the minor arts of the United States from 1600 to the present. Various European and native influences will be emphasized. *Prerequisite:* Junior standing.
- 3201 Painting I* (2-4)**
Introduction to the materials and techniques of oil and other painting media. Development of form through color conditioned to meet the requirements of a controlled composition and aesthetic concept. *Prerequisite:* Art 3103, and Art 3104.
- 3301 Painting II (2-4)**
Continuation of Art 3201. *Prerequisite:* Art 3201.
- 3208 Life Drawing I* (2-4)**
Methods and techniques of sketching from the living model. Emphasis will be placed on anatomy and figure construction. *Prerequisite:* Art 3103, and Art 3104.
- 3308 Life Drawing II (2-4)**
Continuation of Art 3208. *Prerequisite:* Art 3208.
- 3202 Sculpture I* (2-4)**
An introduction to sculptural form and problems through the use of classic and contemporary materials and techniques. *Prerequisite:* Art 3103, Art 3104.
- 3302 Sculpture II (2-4)**
Continuation of Art 3202. *Prerequisite:* Art 3202.
- 3203 Metals I* (2-4)**
Techniques in metal construction, including jewelry, silversmithing, and investment casting of base and precious metals. *Prerequisite:* Art 3103, and Art 3104.
- 3303 Metals II (2-4)**
Continuation of Art 3203. *Prerequisite:* Art 3203.
- 3215 Enamels I* (2-4)**
Basic techniques in enameling from jewelry forms to the enameling of hollow ware. *Prerequisite:* Art 3103, and Art 3104.
- 3315 Enamels II (2-4)**
Continuation of Art 3215. *Prerequisite:* Art 3215.
- 3204 Ceramics I* (2-4)**
A survey of ceramic materials and their function in relation to art values, basic laboratory practice in glazing of ware, related information on survey of clay

*Prerequisite as indicated or equivalent as determined by Department Chairman.

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origins and composition, decorating processes, firing kilns and nontechnical glaze composition. *Prerequisite:* Art 3103, and Art 3104.

- 3304 Ceramics II (2-4)**
A continuation of Art 3204. *Prerequisite:* Art 3204.
- 3205 Printmaking I* (2-4)**
Appreciation of design principles as they apply to print processes, with emphasis on etching and engraving. *Prerequisite:* Art 3103, and Art 3104.
- 3305 Printmaking II (2-4)**
A continuation of Art 3205 with emphasis on lithography. *Prerequisite:* Art 3205.
- 3207 Commercial Design I* (2-4)**
Application of design and aesthetic principles of Commercial Art. *Prerequisite:* Art 3103, and Art 3104.
- 3307 Commercial Design II (2-4)**
Continuation of Art 3207. *Prerequisite:* Art 3207.
- 3311 Practicum and Theory for the Elementary Self-Contained Classroom Teacher (2-4)**
An intensive examination of basic art materials and their application in aiding creative and esthetic growth in the Elementary school child. *Prerequisite or concurrently:* Ed. Psych. & Guid. 3301.
- 3312 Methodology and Theory for Secondary School Art Education Specialists (2-4)**
A study of the literature, materials and theory of Secondary School Art Education. *Prerequisite:* Art 3311, Education 3310 and Junior standing.
- 3321 Methodology, Materials and Theory for Elementary School Art Education Specialists (2-4)**
A survey of materials, methodology and research related to the teaching of Elementary School Art Education. *Prerequisite:* Art 3311 and Art 3312. Offered fall and 1st summer term.
- 3322 Advanced Theory of American Public Secondary School Art Education (3-0)**
An intensive survey of the Sociological, Psychological, Philosophical and Historical foundations of American public school Art Education. *Prerequisite:* Art 3312 and Art 3321. Offered spring and 2nd summer term.
- 3402 Research in Art History (3-0)**
A course for the advanced student which will allow him to explore various phases of Art History beyond the regular offerings. Seminars and papers will be required. *Prerequisite:* Art 3105 and Art 3106.

STUDIO PROBLEMS IN ART

A course for the professionally oriented art student which will permit him to explore in greater depth, those courses in which he has had adequate preparation. *Prerequisite:* Completion of 6 hours in the subject chosen and permission. May be repeated for credit.

- 3405 Studio Problems in Ceramics (2-4)**
- 3406 Studio Problems in Painting (2-4)**
- 3407 Studio Problems in Metals (2-4)**
- 3408 Studio Problems in Sculpture (2-4)**
- 3409 Studio Problems in Printmaking (2-4)**
- 3410 Studio Problems in Advanced Drawing (2-4)**

FOR GRADUATE STUDENTS ONLY

Prerequisite: A minimum of twelve acceptable hours of comparable 3400 level courses. May be repeated for credit when topic varies.

- 3502 Research in Art (3-0) History, [Ceramics, Painting, Metals, Sculpture, Printmaking, Advanced Drawing]**

*Prerequisite as indicated or equivalent as determined by Department Chairman.

DRAMA & SPEECH

H. N. WILLIAMS, *Chairman*
Professors HARDING, LEECH, WILLIAMS, WINGATE;
Associate Professors PEROZZI, WOOD;
Assistant Professors BRAND, ETHERIDGE, JONES, MICULK, RONKE, TUCKER;
Instructors BYRNE, MIDDLETON, SMITH.
 LT. MEL LOCKS.

FOR UNDERGRADUATES

B.A. Degree: Majors in Drama must take the following courses:

- (1) **Drama 3113: Introduction to Theatre**
- (2) **Speech 3103: Voice and Articulation and 1103: Lab.**
- (3) **Four semesters of Drama 1111: Basic Theatre Practice.**
- (4) **In addition, majors must take 19 additional hours of drama (Speech 1101, 3205, 3290 and/or 3491 may be included), 12 of which must be advanced hours (3300-3400 level).**

B.A. Degree: Majors in Speech must take the following courses:

- (1) **Speech 3101, 3103, 1103, 1101, 3205, 3221, and 3334.**
- (2) **Drama 3113 and 1111.**
- (3) **In addition, majors must take 9 additional advanced hours in general speech (3300-3400 level).**

B.A. Degree: Majors in Rhetoric and Public Address must take the following courses:

- (1) **Speech 3101, 3220, 3221, 3222, 3411, 3414, and 3420.**
- (2) **In addition, majors must take 9 additional hours in rhetoric and public address, 6 of which must be advanced hours (3300-3400 level).**

B.A. Degree: Majors in Speech Pathology must enroll under *one* of the following plans:

PLAN I: Non-state certification program

- (1) **Pathology 3110, 3210, 3312, 3313, 3314, 3315, 3316, 3409, 3410, and 3441.**
- (2) **A minimum of 125 hours of clinical practicum (may be taken in conjunction with Pathology 3441.)**

PLAN II: Texas Certification in Speech and Hearing Therapy Program.

- (1) **Pathology 3110, 3210, 3312, 3313, 3314, 3315, 3316, 3409, 3410, and 3441.**
- (2) **Education Psychology & Guidance 3409.
Education Curriculum and Instruction 3496 and 3498.**
- (3) **12 additional hours in upper division education courses (3300-3400).**
- (4) **200 hours of clinical practicum (100 hours obtained in conjunction with Education 3496 and 3498; and 100 hours may be in conjunction with Pathology 3441.)**

FOR UNDERGRADUATES AND GRADUATES

DRAMA

1111 Basic Theatre Practice (0-4)

The laboratory for Drama 3113. Practical laboratory experience in all phases of production of major plays for public presentation. May be taken four semesters for credit.

3113 Introduction to Theatre (3-4)

Analysis of the principles and techniques involved in representing human experience in a play: the relationship of acting, directing, staging, lighting, costuming, and other theatre arts to one another and to the written word. The course is designed to serve not only as an introduction to drama for departmental majors, but as a general survey for non-majors.

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- 4213 Acting I (2-4)**
A lecture-laboratory course in which a student may develop his ability to analyze a character and create a role.
- 4313 Acting II (2-4)**
Detailed study of characterization and styles of acting through assignment of individual roles and group rehearsal of scenes. *Prerequisite:* Drama 4213.
- 4215 Summer Theatre Workshop (2-4)**
A lecture-laboratory course in all phases of drama and theatre, with emphasis on the techniques and procedures of summer theatre operation. Registration in the course enrolls the student in the summer repertory group. May be repeated for credit. Offered in the summer only.
- 4220 Visual Style in the Performing Arts (2-4)**
A survey of period and national styles of theatre architecture, scenery, costumes, furniture, and accessories used in Western performing arts from the earliest times to the present. The course is designed to appeal equally to students of art, dance, drama, and opera.
- 4221 Stagecraft (2-4)**
Introduction to and practice in stage methodology. Includes basic instruction in stage design and structure.
- 4225 Directing I (2-4)**
Analysis of the role of the director in contemporary theatre production. Students will be required to plan and produce a one-act play for presentation.
- 4326 Directing II (2-4)**
Study of techniques of direction in various styles, modes, and periods, together with analysis of the problems of the producer and theatre manager. *Prerequisite:* Drama 4225.
- 3290 Introduction to the Art of the Motion Picture (3-0)**
The historical evolution of motion pictures, and the techniques of the medium. Significant motion pictures from different films illustrating various techniques and genres are shown and discussed.
- 4232 Design I (2-4)**
A lecture-laboratory course designed to develop skill in scenic drafting and mechanical perspective, together with knowledge of construction materials and scene-shifting methods. *Prerequisite:* Drama 4221; Stagecraft.
- 4332 Design II (2-4)**
A lecture-laboratory course designed to develop skill in scenic rendering together with knowledge of period scenery, ornament, and interior decoration as used in all the performing arts. *Prerequisite:* Drama 4221; Stagecraft.
- 4340 A History of Costume (2-4)**
A study of costume from the earliest times to the present and its use on the stage. Practical experience in designing and executing costumes for actual production.
- 4342 Lighting (2-4)**
A history of lighting and an analysis of contemporary lighting techniques. Practice in designing and executing the lighting for major productions.
- 4350 Creative Drama (2-4)**
Methods of developing original dramatizations with children and of creating plays from children's literature.
- 3357 The Early Theatre (3-0)**
Study of theatre art from earliest times to 1642. Discussion of plays, playwrights, actors, costumes, and scenic arts of each historical period.
- 3358 The Modern Theatre (3-0)**
Study of theatre art from 1642 to the present.
- 3418 Playwriting (3-0)**
Principles of writing for stage presentation.

3440 Seminar in Drama and Theatre

Independent research, production projects, and writing guided by a senior faculty member through weekly class meetings and through special laboratory work in the theatre. May be taken only once for credit.

GENERAL SPEECH

1101 Choral Reading (0-2)

The laboratory for Speech 3205, and a course for the study and oral interpretation of literature and drama, with emphasis on group performances. May be taken four times for credit.

1103 Speech Laboratory (0-4)

The laboratory for Speech 3103. Practice in the production of English sounds through the use of recording equipment and special instruction. May not be counted in addition to Speech 3104 or 1104. May be taken twice for credit.

1104 Bilingual Laboratory (0-2)

The laboratory for students who are enrolled in Speech 3104, and for students who have received the grade of P (In Progress) in Speech 3104. Practice in the production of English sounds through the use of recording equipment and special instruction. Students who have already taken Speech 3104 and have received a grade of P may, with permission of the department chairman, take Speech 1104 in conjunction with a bilingual section of Speech 3101.

3103 Voice and Articulation (3-4)

A course designed to improve the student's speech, to study phonemic concepts and the phonetic alphabet, and to examine major dialects of English, including stage speech. The required laboratory for this course is Speech 1103: Speech Laboratory.

3104 Speech for the Bilingual Student (3-4)

A course designed for the bilingual student who wishes to improve his communication. It includes a study of the sound system, the stress pattern, the timing, and the melody of American English. Laboratory periods are required in preparation for an oral proficiency examination which is administered at the end of each semester. The results of this examination are determined by a faculty panel. The required laboratory is Speech 1104.

3205 Oral Interpretation (3-2)

Study and practice of the techniques of oral interpretation of literature. The required laboratory for this course is Speech 1101: Choral Reading.

3206 Introduction to Speech Communication (3-0)

A critical examination of verbal and non-verbal behavior as constituents of the human communication process. Comparison and contrast of the structures and content elements of personal, interpersonal, and public discourse. Emphasis on speaking and listening as the coordination of perception and expression.

3305 Oral Interpretation: Problems and Projects (3-0)

Independent preparation and performance of long and complex programs of oral interpretation. Examination in depth of the esthetic principles of interpretation. *Prerequisite:* Speech 3205. Offered second semester.

3307 Small Group Communication (3-0)

An examination of small group interaction behavior based on research in sociology, psychology, and speech communication. Emphasis on (1) task or decision oriented group work and (2) self-identity or therapeutic oriented group dynamics. Use of the class as a laboratory experience. Examination of group psychotherapy and psychodrama. Offered first semester.

3308 Organizational and Institutional Communications (3-0)

An examination of theory combined with a laboratory approach designed to develop an understanding and proficiency in small group and interpersonal communication within an organizational decision-making context. Emphasis on (1) the discovery of communication barriers, (2) the interviewing techniques and (3) the cybernetic function of the PERT system (Program Evaluation and Review Technique). Direct applications of the material to professional needs, e.g., in business, counseling, or teaching. Offered second semester.

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- 3316 Semantics (3-0)**
Study of the ways in which vocal, verbal, gestural, and pictorial symbols achieve meaning for listeners and speakers. Emphasis on general semantics, and on problems in communication. Offered second semester.
- 3333 Speech for the Elementary Teacher (3-0)**
A course designed to improve the speech of elementary teachers. Includes practice in voice improvement, articulation, story telling, choral speaking, oral interpretation, and discussion. Develops methods of incorporating speech into the elementary curriculum.
- 3334 Speech Education for the Secondary Teacher (3-0)**
A methods course designed for teachers of speech in the secondary school. Emphasis is placed on the development of an effective speech program.
- 3406 Philosophical and Psychological Foundations of Speech (3-0)**
An examination of (1) conceptual and (2) empirical theories of human communication. Detailed analysis of speculative and experimental models of verbal and non-verbal behavior at various symbolic levels ranging from intrapersonal expression and perception to mass communications. Emphasis on "models" as critical and investigative tools in communication analysis.
- 3430 Seminar in General Speech**
Independent research, production projects, and writing guided by a senior faculty member through weekly meetings of the entire group of scholars. May be taken only once for credit. Offered first semester.
- 3431 Practicum in Bilingual Speech**
Supervision of bilingual speech students in controlled laboratory situations. Practice with schedules and lesson plans for bilingual speech training. Written and oral reports on progress of students. May be taken twice for credit.
- 3450 Individual Instruction**
Instruction of students individually or in small groups in a significant area of rhetorical theory, communication theory, public address, or speech education which is not covered by regular catalog offerings. May be repeated for credit when content varies.

RHETORIC AND PUBLIC ADDRESS

- 3101 Public Speaking (3-0)**
Study and practice of the inventing, arranging, phrasing, and presenting of ideas to audiences.
- 3102 Business and Professional Speech (3-0)**
A course designed to train business majors in the fundamentals of speech as they apply to business and professional situations with special emphasis on parliamentary procedure and speeches for special occasions. Not open to drama or speech majors.
- 3220 Introduction to Rhetoric and Public Address (3-0)**
Emphasis on understanding basic concepts of persuasion theory drawn from classical sources and recent findings in speech and social psychology. Model speeches are analyzed. Some attention is given to historical development of rhetorical theory. Lecture and class discussion; not a practice course in public speaking.
- 3221 Argumentation (3-0)**
Understanding and using the techniques of logical appeal: analysis of propositions, discovery of arguments, use of evidence and inference, refutation, detection of fallacies and stratagems. Exercises include team preparation of briefs, presentation of several speeches, analysis and refutation of other students' speeches. Offered first semester.
- 3222 Persuasion (3-0)**
Understanding and using the techniques of persuasion, with particular emphasis on analysis of and adaptation to audiences, manipulation of emotional and motivational states of the audience, and enhancing the persuader's image. Main concern is with public speaking, but application of persuasive techniques in other forms of communication is discussed. Preparation and presentation of a variety of speeches. Offered second semester.

- 3290 Introduction to the Art of the Motion Picture (3-0)**
The historical evolution of motion pictures, and the techniques of the medium. Significant motion pictures from different periods and films illustrating various techniques and genres are shown and discussed. Offered first semester.
- 3307 Small Group Communication**
An examination of small group interaction behavior based on research in sociology, psychology, and speech communication. Emphasis on (1) task or decision oriented group work and (2) self-identity or therapeutic oriented group dynamics. Use of the class as a laboratory experience. Examination of group psychotherapy and psychodrama. Offered first semester.
- 3308 Organizational and Institutional Communication**
An examination of theory combined with a laboratory approach designed to develop an understanding and proficiency in small group and interpersonal communication within an organizational decision-making context. Emphasis on (1) the discovery of communication barriers, (2) interviewing techniques, and (3) the cybernetic function of the PERT system (Program Evaluation and Review Technique). Direct applications of the material to professional needs, e.g., in business, counseling or teaching. Offered second semester.
- 3326 Speech and the Democratic Process (3-0)**
Study of public speaking in the deliberative assembly, the forensic situation, and the election campaign. Practice in deliberative address. Offered second semester.
- 3411 Classical Rhetorical Theory (3-0)**
Study of the evolution of theories of persuasion from pre-Socratic Greece through the Roman empire. Analysis of the contributions to persuasion theory made by Aristotle, Cicero, Quintilian, and other major classical rhetoricians. Offered first semester.
- 3412 Rhetorical Theory: Medieval Period Through 19th Century (3-0)**
Study of theories of persuasion produced by St. Augustine, the church scholastics, and early English rhetoricians, with emphasis on the contributions of Blair, Campbell, and Whately.
- 3414 Contemporary Rhetorical Theory (3-0)**
Study of the contributions to theories of persuasion produced by recent research in speech and social psychology.
- 3415 Speech Criticism (3-0)**
Application of various systems of rhetorical theory to criticism of significant public addresses. Offered first semester.
- 3420 Seminar in Rhetoric and Public Address**
Independent research, production projects, and writing guided by a senior faculty member through weekly meetings of the entire group of scholars. May be taken only once for credit. Offered second semester.
- 3421 Classical Oratory (3-0)**
A study of orators, issues, and speaking arenas of ancient Greece and Rome, with special emphasis on the rhetorical tradition. Offered first semester.
- 3422 British Oratory (3-0)**
Study of orators, issues, and speaking arenas in Great Britain. Offered second semester of alternate years, beginning in 1972-73.
- 3423 American Oratory (3-0)**
Study of orators, issues, and speaking arenas of the United States of America. Offered first semester of alternate years, beginning in 1972-73.
- 3491 Motion Pictures to Inform and Persuade (3-0)**
The uses and techniques of the documentary film. The use of both fiction and non-fiction films as instruments to influence public opinion. Persuasion theory and film theory are applied in analysis of films shown in class. Offered second semester.

SPEECH PATHOLOGY

3110 Phonetics

An introductory course dealing with the fundamental principles of production and recognition of American English sounds. Application to regional dialects, foreign dialects, acting, broadcasting and speech correction. Practice in the use of IPA symbols. Not open to students who enrolled in or have received credit for *Linguistics 3110*.

3210 Survey of Major Speech Disorders (3-0)

Presentation and discussion of the major communication disorders. A general approach dealing with causes and treatment. Field trips to local facilities. Required of all-levels education majors who intend to teach on the elementary level.

3312 Anatomy and Physiology of Speech and Hearing Mechanisms (3-0)

A study of the anatomical and physiological bases of speech. Emphasis is placed upon the neurological aspects of speech, as well as upon the speech mechanism. Offered second semester.

3313 Speech Pathology I (3-0)

Delayed speech and language, articulation problems, and voice production disorders as disturbances of communication. Techniques and materials for speech therapy emphasized, with stress on practical application of theories. Offered first semester.

3314 Speech Pathology II (3-0)

Further investigation of communication disorders, with emphasis on structural anomalies such as cleft palate. Speech problems of disfluency and of language also considered. Offered second semester.

3315 Language Development (3-0)

Theory and chronology of speech and language acquisition. Psycholinguistic considerations. Distinction between linguistic differences and linguistic defects.

3316 Diagnostic Procedures (3-0)

Study of the diagnostic techniques and specific tests utilized in the evaluation of disorders of communication.

3317 Instrumentation and Materials (3-0)

Utilization of the instruments and materials common to the habilitation or rehabilitation of disorders of communication.

3409 Audiology (3-0)

Basic orientation to audiology. Physics of sound, anatomy of the hearing mechanism, pathology of hearing disorders. Pure tone audiometry; air and bone conduction. Offered first semester.

3410 Auditory and Visual Communication

A study of the methods and techniques utilized in the aural rehabilitation or habilitation of the acoustically handicapped. Offered second semester.

3416 Dactylogy (3-0)

The use of sign language and finger spelling in teaching, counseling, and communicating with the manually deaf.

3441 Clinical Practicum in Speech Pathology and Audiology

May be taken three times for credit.

SPEECH/ENGLISH

6101 Communication Skills (6-0)

Instruction and guided practice in the preparation of both oral and written compositions, and in study techniques. Taught jointly by the Department of English and the Department of Drama and Speech. To be taken in place of *Speech 3101* and *English 3101*.

PROGRAM IN MEXICAN AMERICAN STUDIES

3335 Chicano Theatre and Drama

Study of theatre arts in South, Central and North America, with particular emphasis on the work of Indian, Mexican, Latin American dramatists and on North American dramatists concerned with Mexican American culture. Discussion of plays, playwrights, actors, costumes, and scenic arts in Mexican American history. *Prerequisite:* Drama 3113, or permission of the department chairman.

3345 The Rhetoric of Chicano Affairs

Study of theories of persuasion and rhetoric, orators, issues, and speaking arenas of Mexico and the Southwestern United States, with particular emphasis on the contribution of rhetoric and oratory to Mexican American culture. *Prerequisite:* Speech 3220 or permission of the department chairman.

FOR GRADUATE STUDENTS ONLY

DRAMA/SPEECH

3501 Introduction to Graduate Study

3598-99 Thesis

DRAMA

3520 Principles of Stage Presentation

3523 Drama in Human Affairs I

3524 Drama in Human Affairs II

3525 Problems in Creative Dramatics and Children's Theatre

3527 Seminar in Performance (may be taken more than once with a change in area of emphasis)

3528 Problems in Directing

3526 Problems in Creative Dramatics and Children's Theatre

3529 Seminar in Playwriting (may be taken more than once with a change in area of emphasis)

SPEECH

3521 Rhetoric and Politics

3530 Rhetoric of The Deliberative Assembly

3531 Seminar in the Classical Rhetorical Tradition (may be taken more than once with a change in area of emphasis)

3532 Seminar in Contemporary Problems in Rhetoric and Public Address (may be taken more than once with a change in area of emphasis)

3541 Speech Education I

3542 Speech Education II

3543 Communication Theory

3544 Philosophy and Psychology of Language

3550 Directed Study (may be taken more than once when content varies)

3553 Rhetoric of International Relations

3590 Critical Analysis of Motion Pictures

3591 Film as a Medium for Social Influence

SPEECH PATHOLOGY/AUDIOLOGY

- 3561 Seminar in Speech Pathology** (may be taken more than once with a change in area of emphasis)
- 3562 Disorders of Language**
- 3563 Organic Speech and Voice Disorders**
- 3564 Neurological Disorders of Communication**
- 3565 Advanced Audiology**
- 3566 Medical Audiology**
- 3567 Conservation of Hearing**
- 3568 Seminar in Audiology** (may be taken more than once with a change in area of emphasis)
- 3569 Advanced Clinical Practicum**
- 3570 Clinical Management**
- 3572 Problems and Projects in Speech Pathology and Audiology** (may be taken more than once with a change in area of emphasis)

ENGLISH

T. J. STAFFORD, *Chairman*

Professors BRADY, BURLINGAME, COLTHARP, LEACH, PAST, SMALL, WEST;
Associate Professors CARR, DAY, HERNANDEZ, JAMES, RICHESON, STAFFORD, W. TAYLOR,
Assistant Professors ANTONE, BLEDSOE, BOLEY, COLLINGWOOD, EHMANN, ESCH, FUGATE,
 GALLAGHER, JOHNSON, KISKA, LACEY, MORTENSEN, QUARM, STROUD, WADDELL,
 R. WALKER; *Instructors* BRATCHER, CABARRUS, CASTRO, D. COLLINS, CORN, DICK,
 ETHERIDGE, GILL, GLADSTEIN, JUSTICE, MARSHALL, POTTS, SERRANO, C. WALKER;
Undergraduate Adviser JAMES K. P. MORTENSEN.

B.A. Degree — Literature Option: After completing the Freshman English requirement, the English major is required to take English 3211 and 3212 and History 3354 and 3355. (The History courses should be taken in order and concurrently with English 3211 and 3212.)

After completing the Sophomore English requirement, the English major must take 24 hours in advanced-level English courses (English 3419, 3 hours in English Literature before 1800, 3 hours in English Literature since 1800, 3 hours in American Literature, 3 hours in Shakespeare, 3 hours in Major Authors, and 6 elective hours in advanced-level English courses). Of the 24 hours, 6 hours must be in 3400-level courses, and 3 hours must be in a fiction or drama genre course. For a list of courses that satisfy the various block requirements and the genre requirement, the student should see the Undergraduate Adviser. A comprehensive English Major Examination is required of all English majors who cannot present, at the time of their graduation, a grade average of "C" in all their English courses. Consult the English Department Chairman for details.

B.A. Degree — Creative Writing Option: After completing the Freshman English requirement, the English major concentrating in Creative Writing takes English 3211 and 3212 (without History 3354 and 3355). He takes the required courses, English 3361, 3362, 3365, 3367, 3368, 3414, and 3420, and nine more hours of selected literature courses (see English Undergraduate Adviser for details of program).

Entering students may receive advanced placement credit in English by one of the following means:

1. Achievement of a score of 3 or higher on the College Entrance Board's Advanced Placement Examination, together with an S.A.T. Verbal score of at least 550, will give six hours of credit in English 3110-11 with grades of "A" in each semester.
2. The College Entrance Board's Achievement Test in Composition, with a score of at least 550, together with an SAT Verbal Score of at least 550, will give three hours of credit in English 3111, scores of 550-599 on the Achievement Test being recorded as "B" and scores of 600 and above being recorded as "A."
3. A student may place out of 3110 (without credit) with a score of 450 on the verbal section of the College Entrance Board's Achievement Test.

Students planning to transfer to other colleges or universities before receiving their degrees should be counseled on the advisability of accepting advanced placement.

In order that the English Department may confirm College Board scores and do necessary paper work, students should apply by letter for advanced placement credit at least two weeks before the beginning of the semester. Write in care of the English Department.

School of Liberal Arts

- 3110 Freshman Composition (3-0)**
Basic fundamentals of composition; practice in organizing and writing expository paragraphs; emphasis on improved sentence structure, diction, vocabulary, grammar, spelling, and other problems of writing. For students under 450 on SAT.
- 3111 Freshman Composition (3-0)**
Further practice in composition with emphasis on advanced rhetorical and writing principles for the different expository modes; more emphasis on style and variety in sentences, paragraphs, and essays; stress on critical and evaluative reading skills, outlining, and study skills.
- 3112 Freshman Composition (3-0)**
Advanced writing skills and mastery of research technique; introduction to different types of literature; emphasis on the writing of a research paper and critical essays.
- 6101 Communication (6-0)**
Fundamentals of oral and written communication: practice in organizing expository prose; practice in arranging and presenting ideas orally; practice in reading techniques and other study skills. Counts for both English 3111 and Speech 3101.
- 3210 Sophomore Literary Studies (3-0)**
Open to all sophomores, the topic to vary with the professor in charge. May be repeated for credit when the topic varies. *Prerequisite:* English 3112.
- 3211 English Literature (3-0)**
English literature from the beginning to Samuel Johnson. Required of all English majors. *Prerequisite:* English 3112.
- 3212 English Literature (3-0)**
English literature from Samuel Johnson to the present. Required of all English majors. *Prerequisite:* English 3211.
- 3213 Appreciation and Analysis of the Novel and Short Story (3-0)**
Attention to contemporary works as well as to the historical development of the genres. *Prerequisite:* English 3112.
- 3214 Appreciation and Analysis of Drama (3-0)**
Study of the nature and variety of drama through examination of the contemporary theatre and its historical development. *Prerequisite:* English 3112.
- 3215 World Literature in Ancient, Medieval, and Early Renaissance Times (3-0)**
The works of such writers as Lao Tzu, Homer, Aeschylus, Sophocles, Euripides, Vergil, St. Augustine, Dante, Boccaccio, Chaucer, Montaigne, Cervantes, and Shakespeare. All foreign literatures are read in modern translations. *Prerequisite:* English 3112.
- 3216 World Literature from the Early Renaissance to the Present (3-0)**
The works of such writers as Milton, Racine, Voltaire, Goethe, Byron, Poe, Hawthorne, Melville, Flaubert, Dostoevsky, Turgenev, Tolstoy, Chekhov, Ibsen, Baudelaire, Lorca, Joyce, Mann, Kafka, and Proust. All foreign literatures are read in modern translations. *Prerequisite:* English 3112.
- 3218 Appreciation and Analysis of Poetry (3-0)**
Study of the nature and forms of poetry through examination of modern poetry and its historical antecedents. *Prerequisite:* English 3112.
- 3269 Technical Writing (3-0)**
Written and oral reports: assembling material, organizing, writing, and revising. *Prerequisite:* English 3112.

ALL 3300 courses require as prerequisite completion of six hours of sophomore English or Junior standing.

The following symbols indicate when an upper level course is taught: I: Even Fall; II: Odd Spring; III: Odd Summer; IV: Odd Fall; V: Even Spring; VI: Even Summer.

- 3310 Literature of the Mexican American (3-0) (I, II, VI)**
Study of the Mexican American culture in the United States as reflected in literature. *Prerequisite:* Six hours sophomore English or Junior standing.
- 3311 American Literature (3-0) (I, II, IV, V, VI)**
Representative writers from the Colonial period to 1860, with emphasis on major figures such as Poe, Emerson, Thoreau, Hawthorne, and Melville. *Prerequisite:* Six hours sophomore English or Junior standing.
- 3312 American Literature (3-0) (I, II, III, IV, V, VI)**
Representative writers from the Civil War to the present, with emphasis on major figures from Whitman to the present. *Prerequisite:* Six hours sophomore English or Junior standing.
- 3315 Literature of the Black American (3-0) (V)**
Study of the Black American in the United States as reflected in literature. *Prerequisite:* Six hours sophomore English or Junior standing.
- 3316 Medieval English Literature (3-0) (I, III)**
Medieval English literature in translation from 1066 to Chaucer: romances, visions, satires, and the morality play. *Prerequisite:* Six hours sophomore English or Junior standing.
- 3319 Renaissance Prose and Poetry (3-0) (III, V)**
The study of major non-dramatic prose and poetry of the 16th century from More through Drayton with special emphasis on the period of Spenser. *Prerequisite:* Six hours sophomore English or Junior standing.
- 3320 Shakespeare's Major Plays (3-0) (I, II, III, IV, V, VI)**
Detailed study of the major plays, such as *Hamlet*, *Macbeth*, *Romeo and Juliet*, *The Tempest*, and others. *Prerequisite:* Six hours sophomore English or junior standing.
- 3321 Representative Shakespearean Plays (3-0) (I, II, III, IV, V, VI)**
Detailed study of Shakespeare's other well-known plays such as *Taming of the Shrew*, *Richard II*, *King Lear*, and others. *Prerequisite:* Six hours sophomore English or junior standing.
- 3323 Seventeenth-Century Prose and Poetry (3-0) (IV, VI)**
Major poetic movements in the seventeenth century in the works of Donne, Jonson, the Cavalier Poets, Milton, and Dryden. A study of the prose works of Bacon, Browne, Dryden, Hobbes, and others. *Prerequisite:* Six hours sophomore English or junior standing.
- 3329 Early Neo-Classicism (3-0) (IV, VI)**
The background of the English classical period in the writers of the Restoration. *Prerequisite:* Six hours sophomore English or junior standing.
- 3330 The Neo-Classical Age (3-0) (V, VI)**
Pope through Johnson exclusive of the pre-romantics. *Prerequisite:* Six hours sophomore English or junior standing.
- 3331 Early Romantic Literature (3-0) (I, VI)**
A study of the works of Burns, Blake, Wordsworth, Coleridge, Lamb, Hazlitt, and their contemporaries. *Prerequisite:* Six hours sophomore English or junior standing.
- 3332 Late Romantic Literature (3-0) (II, III)**
A study of the works of Byron, Shelley, Keats, Landor, Hunt, DeQuincey, and their contemporaries. *Prerequisite:* Six hours sophomore English or junior standing.
- 3338 Early Victorian Literature (3-0) (IV, VI)**
The works of Tennyson, Browning, Macauley, Carlyle, and their contemporaries. *Prerequisite:* Six hours sophomore English or junior standing.
- 3339 Late Victorian Literature (3-0) (III, V)**
The works of Arnold, Newman, Ruskin, Pater, Stevenson, Rossetti, Meredith, Morris, Swinburne, Hardy, Hopkins, Housman, and the early Yeats. *Prerequisite:* Six hours sophomore English or junior standing.

- 3344 Contemporary Poetry (3-0) (II, V)**
The most important poets of the twentieth century. Special emphasis is given to Hopkins, Yeats, Eliot, Frost, D. H. Lawrence, Graves, W. C. Williams, Pound, Hart Crane, Stevens, and Dylan Thomas. *Prerequisite:* Six hours sophomore English.
- 3353 The Short Story (3-0) (II, VI)**
The development of the short story from earliest times; typical specimens from the short-story literature of England, America, Russia, France, and other countries. *Prerequisite:* Six hours sophomore English or junior standing.
- 3361 Creative Writing (3-0) (I, III, IV, VI)**
Basic techniques of writing applicable to both fiction and nonfiction. For students interested in perfecting their powers of written expression and/or critical abilities. Emphasis is on contemporary communication at various reader levels with particular attention to viewpoint and style. The course includes a survey of character portrayal and an introduction to plotting techniques. *Prerequisite:* See Undergraduate Adviser.
- 3362 Creative Writing: Nonfiction (3-0) (II, V)**
Study and practice in the techniques of contemporary nonfiction. Scope includes communication on various levels of readership from scholarly to popular, analysis of periodical article types and their structure, and techniques of biographical writing. Attention is given to the creative aspects of nonfiction and to the use of fictional techniques in nonfiction. *Prerequisite:* See Undergraduate Adviser for details.
- 3365 Advanced Composition (3-0) (I, III, IV, VI)**
Intensive review of grammar and the techniques of composition; practice in organizing, writing, and revising mature prose; review and practice of advanced techniques in doing research and writing term papers. *Prerequisite:* See Undergraduate Adviser.
- 3367 Creative Writing: Fiction Development from Character (3-0) (I, IV, VI)**
Study and practice in the techniques of contemporary fiction writing with emphasis upon the development of fiction from character portrayal. *Prerequisite:* English 3361.
- 3368 Creative Writing: Development of Dramatic Situation (3-0) (II, III, V)**
Study and practice in the techniques of contemporary fiction writing with particular attention to dramatic structure and impact as applicable to both the short story and longer forms. *Prerequisite:* English 3361.
- 3370 The Writing of Poetry (3-0) (V)**
Study and practice in the writing of traditional and contemporary forms of poetry, with attention to such basic elements as imagery, symbolism, etc. *Prerequisite:* Six hours sophomore English or junior standing.
- 3371 Life and Literature of the Southwest (3-0) (IV)**
The social background of the Southwest and its reflection in literature. *Prerequisite:* Six hours sophomore English or junior standing.
- 3372 Folklore (3-0) (I, III, IV, VI)**
The types and characteristics of folk literature with particular emphasis on the folklore of the Southwest and Mexico. *Prerequisite:* Six hours sophomore English or junior standing.
- 3373 Life and Literature of the South (3-0) (I, III, IV, VI)**
Literature of the Old and New South, especially as it reflects the institutions and traditions of the region. *Prerequisite:* Six hours sophomore English or junior standing.
- 3374 Folklore of the Mexican American (3-0) (II, V, VI)**
Study of the Mexican American culture in the United States as reflected in folklore. *Prerequisite:* Six hours sophomore English or junior standing.
- 3375 Folklore of the Black American (3-0) (II)**
Study of the Black American in the United States as reflected in folklore. *Prerequisite:* Six hours sophomore English or junior standing.

- 3385 Russian Literature in Translation (3-0) (I, IV)**
Prose fiction beginning with Pushkin and extending through the Golden Age of the nineteenth century, with special emphasis on Lermontov, Gogol, Turgenev, Dostoevsky, Tolstoy, Chekhov, Andreyev, and Gorky. *Prerequisite:* Six hours sophomore English or junior standing.
- 3386 Background Readings (3-0) (I, II, IV, V)**
A course of variable content that will provide readings of foreign literatures in translation, as background support for significant portions of English and American literature. May be repeated once for credit when the topic varies. *Prerequisite:* Six hours sophomore English or junior standing.
- All 3400 courses require six hours of 3300 level literature courses.**
- 3411 Milton (3-0) (II, III, V, VI)**
An introduction to the work and times of John Milton. *Prerequisite:* Six hours of advanced courses in English.
- 3413 Chaucer (3-0) (I, III, IV, VI)**
A survey of the life and works of Geoffrey Chaucer with emphasis on *The Canterbury Tales*. *Prerequisite:* Six hours of advanced courses in English.
- 3414 Literary Criticism (3-0) (I, III, IV, VI)**
The development of literary theory as seen in the major critics from Plato to the present. *Prerequisite:* Six hours of advanced courses in English.
- 3415 Elizabethan and Jacobean Drama (3-0) (I, III)** [Formerly 3322]
Development of the comedy, the tragedy, and the chronicle history from earlier types of the drama in England. Plays of Lyly, Marlowe, Greene, Beaumont and Fletcher, Dekker, Jonson, Middleton, Webster, and their contemporaries related to the literary fashions of the times. *Prerequisite:* Six hours advanced English.
- 3419 The History of the English Language (3-0) (I, II, III, IV, V, VI)**
The development of the English language from Old through Middle to Modern English, with selected readings in the original. *Prerequisite:* Six hours of advanced courses in English.
- 3420 Workshop in Creative Writing (3-0)**
Intensified practice in and perfection of one or more of the techniques of mature creative writing. The scope of the course will vary with the instructor. May be repeated once for credit. *Prerequisite:* English 3368 or 3370.
- 3421 The American Novel (3-0) (II, V)** [Formerly 3313]
The representative American novels and novelists from 1787 to the present. *Prerequisite:* Six hours advanced English.
- 3422 The American Drama (3-0) (VI)** [Formerly 3314]
Drama from the Colonial and Revolutionary periods to modern times. Special attention is given to the works of Bird, Boker, Fitch, Crothers, Anderson, Hellman, O'Neill, Williams, and Miller. *Prerequisite:* Six hours advanced English.
- 3425 British Drama since 1880 (3-0) (IV)**
Historical Study of dramatic theory and practice in England in the modern era, through reading of representative plays. *Prerequisite:* Six hours sophomore English.
- 3440 Special Studies (3-0) (I, II, IV, V)**
Pro-seminar open to English majors, the topic to vary with the professor in charge. See Department Chairman for details. *Prerequisite:* a 3.0 average in nine hours of advanced courses in English or consent of the instructor. May be repeated for credit when the topic varies.
- 3447 The English Novel Through the Eighteenth Century (3-0) (I, III, IV)** [Formerly 3347]
Prose fiction in England from the Middle Ages through the eighteenth century, particular attention being given to the novels of Richardson, Fielding, Smollett, Walpole, Burney, Jane Austen, and Scott. *Prerequisite:* Six hours advanced English.

School of Liberal Arts

- 3448 The English Novel: Nineteenth Century (3-0) (II, V, VI)** [Formerly 3348]
A continuation of English 3347, with study of typical works of Dickens, Thackeray, the Brontës, George Eliot, Hardy, and Meredith. *Prerequisite:* Six hours advanced English.
- 3449 The English Novel: Twentieth Century (3-0) (II, III, V)** [Formerly 3352]
The important English novelists of the twentieth century, with special study devoted to the works of Conrad, Bennett, Lawrence, Joyce, Forster, Waugh, Woolf, Graham Greene, Henry Green, Cary, and William Golding. *Prerequisite:* Six hours advanced English.
- 1455-6455 Workshop in the Teaching of English (1 to 6-0) (I, II, IV, V)**
May be repeated for credit when the subject varies. *Prerequisite:* Permission of the department head. May be counted as English or as Education 1455-6455.
- 3480 Old English Language and Literature (3-0) (IV, VI)**
A concentrated study of Old English, with selected readings from Anglo-Saxon literature in the original. *Prerequisite:* Six hours of advanced courses in English.
- The following linguistic courses may be taken for English credit.**
- 3220 Introduction to Linguistics (3-0)**
Introduction to modern language studies with emphasis on contemporary as opposed to historical linguistics. *Prerequisite:* English 3102.
- 3307 The Structure of the English Language (3-0)** [Formerly 3309]
Investigation of Modern English: a study of modern analyses of the language. *Prerequisite:* Six hours sophomore English. *Recommended prerequisite:* English 3220 or Speech 3110. (May be taken as Linguistics 3307.)
- 3308 Methods of Teaching English as a Foreign Language (3-0)**
Modern foreign-language teaching techniques with particular attention to the problems of the learner of English. Theories of language learning and testing, and the practical use of language laboratory equipment. *Prerequisite:* Six hours sophomore English. (May be taken as Linguistics 3308).
- 3395 Linguistics in the Classroom (3-0)**
A study of the use of linguistic theory in the teaching of English. Meets the requirements for English 3309 for undergraduate secondary education majors. *Prerequisite:* Six hours sophomore English. (May be taken as Linguistics 3395.)
- 3471 Studies in English as Language (3-0)**
Subject is chosen by the professor in charge. May be repeated for credit when the topic varies. *Prerequisite:* Six advanced hours in English. *Recommended prerequisite:* English 3220 or English 3309, or permission of the instructor. (May be taken as Linguistics 3471.)
- 3472 Contrastive Linguistics, Spanish, English (3-0)**
A contrastive study of the phonological, morphological and syntactical systems of Spanish and English. *Prerequisite:* Six hours of advanced courses in English, plus one of the following: Speech 3110, English 3220, Spanish 3400, or permission of the instructor. (May be taken as Linguistics 3472.)

FOR GRADUATE STUDENTS ONLY

JOSEPH LEACH, *Graduate Adviser*

Department of English Graduate Faculty: Professors BRADY, BURLINGAME and LEACH. *Associates:* Professors ANTONE, BLEDSOE, COLTHARP, CARR, DAY, GALLAGHER, HERNANDEZ, JOHNSON, STAFFORD, TAYLOR and WEST.

M.A. degree prerequisites: Eighteen semester hours of advanced courses in English and a Bachelor's degree. Foreign students must supply a satisfactory grade in a special proficiency test in the English language before being allowed to register (write Graduate Adviser, Department of English, for details.)

M.A. degree requirements:

1. Fourth-semester college level proficiency in French, German, or Spanish — to be completed by the time the student has accumulated 15 hours of graduate credit.

2. Thirty semester hours of graduate courses in English, at least twenty-four of which are courses numbered between 3500 and 3600; the remainder may consist of courses numbered between 3400 and 3500, provided these courses were not used to satisfy requirements for an undergraduate degree.
3. A satisfactory score on a written comprehensive examination covering the following six subject areas: Old and Middle English, Renaissance to 1660, Neo-Classicism 1660-1798, Nineteenth and Twentieth Century British, American Literature to 1860, American Literature 1860 to the present.
4. Two suitably bound Master's papers (research papers prepared in graduate Studies courses). *By special permission of the Graduate Adviser, a suitably bound Master of Arts thesis (prepared in English 3598 and 3599) may be presented in place of the two Master's papers.*

GENERAL COURSES

- 3511 Studies in Scholarly Methods and Bibliography (I, III, IV, VI)**
The basic course for graduate work in English. Designed to equip the graduate student with effective techniques for preparing the Master's paper, the M.A. thesis, and other forms of scholarly research and writing.
- 3516 Studies in Modern Poetry* (3-0) (III, V)**
This course considers the works of both British and American poets ranging from the work of Hardy down to poets of the post-1945 era. Varying topics concentrate on groups of two to four poets.
- 3565 Studies in Folklore* (3-0) (II, V)**
Concentrated study of a major area of folklore. Field collecting and bibliographic research are major features of the course. Varying topics include the ballad, the folktale, belief and superstition, myth and religion, and folk wisdom.
- 3580 Studies in Comparative Literature* (3-0) (IV)**
Concentrated study of a particular writer or in a particular literary genre or movement in world literature in translation. Varying topics include the literature of France, Germany, Latin America, and others.
- 3598-99 Master of Arts Thesis (I, II, III, IV, V, VI)**
To be taken only by those who have been approved by the graduate committee to write a six hour thesis.

AMERICAN LITERATURE

- 3520 Readings in Poe and His Influence (3-0) (II, VI)**
A close scrutiny of the best of Poe's verse, prose, and essays prior to analyzing his literary influence at home and abroad.
- 3525 Studies in American Transcendentalism (3-0) (II, VI)**
The works of Emerson, Thoreau, and Whitman as they relate to Transcendental thought.
- 3535 Studies in American Literary Thought (3-0) (I, IV)**
The major ideological concepts that have figured importantly in American literature.
- 3540 Studies in Melville and Hawthorne (3-0) (II, IV)**
This course considers the more important fictional works of Nathaniel Hawthorne and Herman Melville.
- 3541 Studies in American Fiction* (3-0) (I, III, V)**
Individual investigations into some central aspect of the American novel. Varying topics include the novel as belles lettres, the novel as philosophical expression, the novel as social relevance, Faulkner, and other writers.
- 3545 Readings in American Literature* (3-0) (V)**
Concentrated study of a particular writer or in a particular period, genre, or movement in American literature.

ENGLISH LITERATURE

- 3549 Readings in Old English in Translation (3-0) (V)**
A study of chronicles, lyrics, epics, and other literary forms originating in Old English together with critical evaluations of representative works in both verse and prose.
- 3550 Studies in Chaucer* (3-0) (II, IV)**
The principal major and minor works of Chaucer surveyed in terms of his biography, literary dependencies, and social and religious backgrounds. Varying topics include *Troilus and Criseyde*, biographical problems, Chaucer's circle, Chaucer's contemporaries, and themes in the *Canterbury Tales*.
- 3551 Readings in Middle English Literature (3-0) (I)**
An investigation in the original or in translation of the main kinds of literature produced in the Middle Ages together with a reading and evaluating of its chief masterpieces.
- 3560 Studies in Shakespeare* (3-0) (I, III, IV)**
A review of Shakespeare's life, poems, and dramas to encourage original research as well as to introduce procedures of teaching and interpreting Shakespeare's works. Varying topics include Shakespeare as non-dramatic poet, biographical problems, Shakespeare's circle of friends, and literary and historical themes in Shakespeare's drama.
- 3561 Readings in Renaissance Literature* (3-0) (II, VI)**
Concentrated study of a particular writer or in a particular literary genre or movement in English literature between 1485 and 1660. Varying topics include Renaissance Drama, Ben Jonson, poetry of the Cavaliers, metaphysical poetry, and others.
- 3562 Studies in Neo-Classicism* (3-0) (I, III)**
Concentrated study of a particular writer or in a particular literary genre or movement in English literature between 1660 and 1798. Varying topics include Dryden, Restoration drama, Pope, Johnson, Swift, and others.
- 3563 Studies in 19th Century English Literature* (3-0) (III, V, VI)**
Concentrated study of a particular nineteenth century English writer or combination of writers. Varying topics include Byron, Keats and Shelley, and Browning and Tennyson.
- 3564 Studies in the English Novel* (3-0) (I, V)**
Study of the better known works of a major nineteenth or twentieth century English novelist. Varying topics include Hardy, D. H. Lawrence, Joyce, and Dickens.

LANGUAGE AND LINGUISTICS

- 3508 Second Language Teaching-English
- 3509 English Linguistics
- 3519 English Historical Linguistics
- 3570 Studies in English as Language*
- 3571 Tagmemics
- 3572 Transformational-Generative Grammar
- 3573 Dialectology
- 3514 Psychology
- 3591 Spanish

*Seminar; may be repeated for credit when the topic varies.

HISTORY

WAYNE E. FULLER, *Chairman**Professors Emeritus* PORTER, STRICKLAND, WALLER;*Professors* BAILEY, FULLER, KNIGHT, MCNEELY, SHOVER, TIMMONS;*Associate Professors* CREIGHTON, JACKSON; *Assistant Professors* BROADDUS, CLARK,

CLYMER, HACKETT, KAWASHIMA, KUZIHIAN, SCHALK.

For Undergraduates

B.A. Degree — Specific course requirements for History major are: History 3101-3102, 3201-3202, and twenty-one advanced hours, of which no more than twelve hours should be taken in any one field of History. The four fields are: Field I. The United States. Field II. Asia, Russia, and Africa. Field III. Hispanic America. Field IV. Europe, except Russia.

Soviet and East European studies option: Specific requirements for all students in the Program: Russian 3321, 3323; Political Science 3324, 3338; History 3331 or 3333 and 3373 or 3374; Economics 3395; Geography 3207; English 3385 or 3386. The History major must include 3331-3333 and 3373-3374. The remaining additional advanced hours of history courses should be selected in consultation with Professor Z. Anthony Kruszewski, advisor for Soviet and East European Studies.

Honors Courses — Qualified students interested in Honors Courses should consult the chairman of the department. Honors courses which have been offered include: History 3101, 3102, 3201, 3202, 3381 and 3382.

3101 History of the United States, to 1865 (3-0)

Survey of American history through the Civil War, emphasizing the European background, the colonial contribution, the American Revolution, the republican government, growth of democracy, the background and course of the Civil War.

3102 History of the United States, since 1865 (3-0)

Reconstruction, rise of big business, clash of economic interests, struggle for reform, imperialism and world power status, Progressivism, World War I, the Twenties, the New Deal, World War II, post-war America.

Prerequisites for 3200 courses in History: Sophomore standing recommended but not required.

3201 Western Civilization, to 1648 (3-0)

An analysis of "Western" man from the pre-Greek Near East to the seventeenth century and the emergence of revolutionary new ideas on man and the universe. (Readings will vary among sections but will be similar in quantity.)

3202 Western Civilization, since 1648 (3-0)

An analysis of the "West" from the scientific revolution of the seventeenth century to present world-wide social, political and revolutionary conflict, concentrating especially on the origins and nature of the problems plaguing mankind. (Readings will vary among sections but will be similar in quantity.)

3205 Latin America — The Colonial Period (3-0)

A general survey, emphasizing the Indian Civilizations, the Spanish Colonial empire, and the revolutions for independence.

3206 Latin America — The National Period (3-0)

A continuation of History 3205, emphasizing the national histories of the ABC countries and Mexico.

3209 The Chicano (3-0)

A survey of Mexican-Americans in the southwestern U.S. since the Treaty of Guadalupe Hidalgo, with emphasis on interactions between Mexican and Anglo-American cultures.

For Undergraduates and Graduates

General Prerequisites: Appropriate class standing. Twelve semester hours of History, or six hours of History and six hours of other social sciences.

FIELD I: THE UNITED STATES

- 3301 Colonial America, to 1763 (3-0)**
Background of European exploration and colonization, settlement and development of the English colonies, British imperial policy, and the Anglo-French conflict in North America.
- 3302 The Era of the American Revolution, 1763-1789 (3-0)**
Causes of the colonial revolt, the military, political, diplomatic, social aspects of the Revolution, the Confederation, and Federal Constitution.
- 3303 The Early National Period, 1789-1829 (3-0)**
The new government under the Constitution, Hamiltonian federalism, development of foreign policy, rise of Jefferson Democracy, expansion, War of 1812, the new nationalism, and the emergence of sectional issues.
- 3304 The Age of Jackson, 1820-1860 (3-0)**
Political, economic, social, and sectional aspects of the Jacksonian era. The Old South and slavery, the North and reform, Manifest Destiny, nativism, and the disruption of the political party system.
- 3305 The Civil War Era, 1860-1877 (3-0)**
Civil War and Reconstruction: Election of Lincoln, outbreak of war, Union and Confederacy, military problems, nations at war, Reconstruction conflicts, triumph of Radicalism, Compromise of 1876.
- 3306 The Rise of Modern America, 1876-1900 (3-0)**
The legacy of Reconstruction, growth of industry, organized labor, the rise of the city, passing of the frontier, the eclipse of agrarianism, protest and reform, the acquisition of a colonial empire.
- 3307 The Twentieth Century: From Roosevelt to Roosevelt (3-0)**
The United States as a world power, foreign policies, domestic problems, the Progressive Era, World War I, the Twenties, the Great Depression.
- 3308 Contemporary America, 1933 to the present (3-0)**
The New Deal at home and abroad, intellectual trends in the Thirties, World War II, post-war domestic problems, the Cold War, the United States as leader of the Free World.
- 3310 American Legal History (3-0)**
A study of the growth of American law from colonial times to the present. Particular emphasis on the operation of the law in a broad social context. Strongly recommended for pre-law students.
- 3311 History of American Foreign Relations, to 1900 (3-0)**
Ideas, philosophies, and emotions underlying American foreign relations, with emphasis on the diplomacy of the American revolution, the War of 1812, territorial expansion including the Mexican-American War, the Civil War, and American imperialism.
- 3312 History of American Foreign Relations, since 1900 (3-0)**
An overview of American foreign relations in the twentieth century with emphasis on underlying ideas, philosophies, and emotions that affect American diplomacy. United States relations with Latin America, Asia, and Europe are considered with special emphasis given to colonialism, the diplomacy of World War I, World War II, and the Indochina conflict.
- 3313 The Afro-American in United States History, 1619 to the present (3-0)**
The African heritage of the black man, the origins of slavery, the Afro-American's response to slavery, the Abolitionist Movement, the Freedman in the post-slavery period, the Freedman and the New South, the Afro-American in the age of industrialism, the Harlem Renaissance, protest movements, and towards the new future.

- 3314 Intellectual History of the United States, to 1900 (3-0)**
Analysis of main trends in pre-twentieth century American thought, with emphasis on Puritanism, the Enlightenment, Transcendentalism, and the impact of Darwin.
- 3315 Twentieth Century American Thought (3-0)** [Formerly 3414]
Major figures and movements dominating the American intellectual scene since the 1890's. Emphasis on philosophical, religious, scientific and social thought.
- 3316 Southwest Frontier (3-0)**
A study of the nineteenth-century American Southwest, the arid frontier, and the area of the international boundary. May not be counted as credit toward the Master of Arts degree. Note: History majors may count this course in either Field I or Field III.
- 3317 History of Texas, since 1821 (3-0)**
Spanish and Mexican Texas, Anglo-American colonization, the Texas Revolution, the Republic, statehood, Civil War and Reconstruction, railroad and industrial growth; political, social, and economic trends in the twentieth century. May not be counted as credit toward the Master of Arts degree. Note: History majors may count this course in either Field I or Field III.
- 3319 The Old South (3-0)**
A history of the economic, social, and cultural development of the South to the Civil War.
- 3320 The New South (3-0)**
A history of the American South since 1876, emphasizing the social, economic, and political adjustments in the late 19th century, and the vast changes in Southern society since World War I.
- 3321 The American Frontier, to 1840 (3-0)**
Concepts governing the frontier interpretation of American history; patterns of frontier expansion from the Atlantic Coast to the Mississippi River; political and economic development; imperial rivalry for control of the continent.
- 3322 The American Frontier, since 1840 (3-0)**
Envelopment of the continent through expansion of the American political and economic system; military conquests; patterns of exploitation of natural resources and accommodation of American institutions to the Trans-Mississippi West and through the mining, cattle, transportation, farming, and urban frontiers.
- 3323 U.S. Urban History to 1880 (3-0)**
The beginnings and growth of urbanization in America, and the impact of industrialization, transportation, population and the frontier on this process.
- 3324 U.S. Urban History since 1880 (3-0)**
Changes in the American city, emphasizing population and migration, technological change, urban culture, crime, poverty and city planning.
- 3325 History of Mass Media in America (3-0)**
Development and role of newspapers, books, radio, television, magazines, and movies in American life, with particular emphasis on the communications revolution of the twentieth century.
- 3328, American Social History to 1865 (3-0)**
A survey of social trends and social movements through the Civil War, with emphasis on ethnic groups, class conflict and urbanization.
- 3329 American Social History, 1865 to the present (3-0)**
A survey of social trends and social movements since the Civil War, with emphasis on ethnic groups, class conflict, and urbanization and industrialization.

FIELD II: ASIA, RUSSIA, AND AFRICA

- 3330 History of the Far East (3-0)**
Modernization of the nations of the Far East with particular attention given to China and Japan. The social, political, economic, and intellectual aspects of this transformation are considered in the light of the impact of Western influences.

- 3331 History of Russia, to 1905 (3-0)**
Survey of Russian history from the earliest times with special attention given to the institutions, literature, church, and foreign policy.
- 3333 History of Russia, 1905 to the present (3-0)**
The Revolution of 1905, World War I, the Revolutions of 1917, with special emphasis on the Soviet state since 1917.
- 3336 Islamic Saints and Sinners: The Muslim World to 1050 (3-0)**
The mysteries, lives and accomplishments of Muhammad's people from Spain to Indonesia, from animist Arab bedouin to Harun al-Rashid's Baghdad, from monotheism to mysticism. Emphasis on what Muslims said and say about themselves. Lectures and discussions.
- 3337 The World of Islam, from 1050 to the Present (3-0)**
Muhammad's people from the onslaughts of the steppe people to the Israeli crises, from the Spanish Reconquista and Granada to Moorish overtones in Mexico and Muslims in Bangladesh, from religion, society and government to the arts, philosophy and science. Emphasis on Muslims writing about Muslim friends and enemies. Lectures and discussions.
- 3338 European and Near Eastern Economic History (3-0)**
An economic study of history from pre-industrial Europe to Marxist socialism and the Common Market. Emphasis on the writings and the society of farmers, artisans, merchants, bankers, entrepreneurs, economists, and philosophers. Lectures and discussions. Note: History majors may count this course in either Field II or Field IV.
- 3339 The Near East and North Africa, since 1798 (3-0)**
Colonialism vs. nationalism in the Islamic world; Europe, the Eastern Question, and the Crimean War; the dilemma of modernization; the Israel-Arab conflict.

FIELD III: HISPANIC AMERICA

- 3341 The History of Spain and Portugal (3-0)**
A survey of the Iberian peninsula from the earliest times to the regimes of Franco and Salazar, with particular emphasis on the rise, development, and decline of the Spanish and Portuguese empires. Note: History majors may count this course in either Field III or Field IV.
- 3342 The Spanish Borderlands (3-0)**
A study of the Spanish northern frontier in North America from California to Florida, with particular emphasis on the Spanish impact on the American Southwest from the sixteenth-century explorations to the Provincias Internas. Note: History majors may count this course in either Field I or Field III.
- 3343 Spanish-Indian Relations in Mexico and the Southwest (3-0)**
A study of the conquest of the New World and its sequel, with particular emphasis on American and Iberian antecedents, the first meeting of the races in America, racial policies of state and church in colonial times, the society of castes, the revolt of the man with a dark skin, and related aspects such as the "Black Legend," the "White Legend," Encomienda, Corregimiento, population decline, Indian free labor, peonage, and the varied race relations in the Americas in the colonial period.
- 3346 The United States and Latin America (3-0)**
A history of the Hispanic relations of the United States, emphasizing recognition, Monroe Doctrine, the United States and Mexico, Pan Americanism, the Big Stick, the Good Neighbor, the Organization of American States, and hemispheric affairs since the rise of Castro. Note: History majors may count this course in either Field I or Field III.
- 3347 South America, since 1810 (3-0)**
A history of the South American countries beginning with revolution for independence, emphasizing their political, social, economic, and cultural development.
- 3348 Mexico in the Colonial Period, to 1821 (3-0)**
The pre-Columbian civilizations, Spanish conquest and colonization of the Caribbean and Spanish North America, colonial institutions and culture, and the Mexican movement for independence.

- 3349 Mexico, since 1821 (3-0)**
Independent Mexico, the period of Santa Anna, Juárez and the Reform, the Díaz regime, the Revolution, major developments since 1920.
- 3350 History of the Mexican Revolution, 1910 to 1940 (3-0)**
Political, social, economic, and military development of the Mexican Revolution from the presidential election of 1910 through the presidency of Lázaro Cárdenas.

FIELD IV: EUROPE, EXCEPT RUSSIA

- 3351 England From the Black Death to the Armada (3-0)**
A study of England in transition from the late middle ages to the early modern age with emphasis on the Tudors.
- 3352 The English Revolution (3-0)**
The causes, events, and consequences of one of the first modern revolutions from the late Elizabethan age to 1688.
- 3354 England, to 1547 (3-0)** [Formerly 3203]
Major developments in England from its prehistory through the reign of Henry VIII. *Prerequisite:* Junior standing or concurrent enrollment in English 3211.
- 3355 England, since 1547 (3-0)** [Formerly 3204]
A continuation of History 3354 to the present. *Prerequisite:* Junior standing or concurrent enrollment in English 3212.
- 3357 The Greeks, from Homer to Alexander (3-0)**
The ancient Greeks and their civilization, from Minoan and Hittite precedents, through Athenian and Spartan triumphs and disasters, to Macedonian political hegemony. Emphasis on what Greeks said about their world and themselves in their epics, plays, histories and philosophies. Lectures and discussions.
- 3358 History of Rome (3-0)** [Formerly 3371]
The Roman Republic, its expansion and overthrow, and the early Empire to the revolution of Septimius Severus, 193 A.D.
- 3360 Byzantine History (3-0)** [Formerly 3372]
The Christian Roman Empire in its medieval Greek form, its survival of barbarian invasions, its destruction of Persia, and its resurgence against Islam, to the capture of Constantinople by the Fourth Crusade, 527-1204 A.D.
- 3361 The Early Middle Ages, 200-1100 A.D. (3-0)**
The feudalization of Roman civilization, church and state in the later Roman Empire, the migrations and the First Europe, Islamic, Byzantine, and Germanic empires and civilizations, the early European social order, the European Revolution of the 11th century.
- 3362 The Later Middle Ages, 1100-1400 (3-0)**
Church and State in the Later Middle Ages, urban civilization and agricultural innovations, international trade, feudal rule in the New Europe, the universities, Europe in transition.
- 3363 European Intellectual History, from the Renaissance to the French Revolution (3-0)**
Thoughts of individuals and currents of thought from Machiavelli to Burke seen in relationship to the social and political reality out of which they sprang.
- 3364 European Intellectual History, since the French Revolution (3-0)**
Thoughts of individuals and currents of thought from Burke to the present seen in relationship to the social and political reality out of which they sprang.
- 3365 The French Revolution and Napoleon (3-0)**
An analysis of the background, events, and significance of the Revolutionary and Napoleonic era from the late eighteenth century to the Congress of Vienna.
- 3370 Early Renaissance and Reformation Era, 1400-1540 (3-0)**
An analysis and comparison of the social, political, intellectual and religious experience of Italy, France, Germany, and Spain in an attempt to understand the origins and nature of the Renaissance and Reformation.

School of Liberal Arts

- 3371 Late Renaissance and Reformation Era, 1540-1660 (3-0)**
An examination of results growing out of the early years of the Renaissance and Reformation, focusing especially on the nature and causes of disagreement, the so-called religious wars, the "crisis" of Europe during this time, and the apparent resolution of the crisis by the mid-seventeenth century.
- 3372 France, from Renaissance to Revolution (3-0)**
An analysis of French history from the end of the fifteenth century to the eve of the French Revolution, focusing in particular on the social, political, intellectual and religious changes which prepared the way for the Enlightenment and the French Revolution.
- 3373 History of Central Europe to 1815 (3-0)**
Political, economic, social, and cultural history of Germany, the Habsburg Empire, and Poland, from their origins to the Congress of Vienna.
- 3374 Modern Germany since 1815 (3-0)**
The emergence of a unified German national state, relations with neighboring powers, World War I, the revolution of 1918, the Weimar Republic, rise and fall of the Third Reich, divided Germany.
- 3375 France, from the Revolution to present (3-0)** [Formerly 3359]
A survey of the social, economic, and political development of France from the French Revolution to the present, with emphasis on France's search for political stability in the post-Revolutionary era.
- 3376 Modern Europe, 1815-1870 (3-0)**
Emphasis on Europe in a process of fundamental political and social change, including the revolutionary movements of the 1820's, 1830, 1848, and 1870; the unification of Italy and Germany; and the development of industrialization, nationalism, socialism, liberalism, and conservatism.
- 3377 Modern Europe, 1870-1919 (3-0)**
The emergence of an industrial Europe and its effects on nationalism, socialism, liberalism, and conservatism; the causes of World War I; the Russian Revolution; and the Paris Peace Conference.
- 3378 Modern Europe, 1919 to present (3-0)**
The development of totalitarian dictatorships in Italy, Germany, and Russia; the position of the Western democracies, particularly France and England; events and movements since World War II; the present outlook.
- 3381 Reading Course for Honors Students (3-0)**
Reading and discussion of topics. Instructor's permission necessary. Note: History majors may count this course in any of the four fields.
- 3382 Research Course for Honors Students (3-0)**
Preparation of a research paper. *Prerequisite:* History 3381 or consent of instructor. Note: History majors may count this course in any of the four fields.
- 3390 History, Special Topics (3-0)** [New]
An examination of a currently relevant subject from a historical perspective. Topics will vary and will be drawn from such fields as minority groups, women's history, local history, ecology, historical methodology and the relationship of history to other social sciences.
- 3399 History and Historians (3-0)** [Formerly 3499]
Survey of historical thought from Herodotus to Voltaire, with emphasis on Greek, Christian, Renaissance, and Enlightenment conceptions of history. Includes an analysis of the problems confronted in modern historical thought. Note: History majors may count this course in any of the four fields.

FOR GRADUATE STUDENTS ONLY

Prerequisite for Graduate credit: At least twelve semester hours of advanced courses in History and a bachelor's degree. Consent of instructor required except for 3581.

- 3501 Society in the American English Colonies (3-0)**
Lectures, discussion, and reports.
- 3506 The Civil War Era, 1850-1876 (3-0)**
Lectures, discussion, and reports.

- 3510 The Era of Reform, 1890-1917 (3-0)**
Lectures, discussion, and reports.
- 3513 The South since the Civil War (3-0)**
Lectures, discussion, and reports.
- 3514 Western America (3-0)**
Lectures, discussion, and reports.
- 3515 Problems in American Diplomatic History (3-0)**
Lectures, discussion, and reports.
- 3517 American Thought (3-0)**
Lectures, discussion, and reports.
- 3518 Problems in the History of Texas (3-0)**
Lectures, discussion, and reports.
- 3519 Spain in the American Southwest (3-0)**
Lectures, discussion, and reports.
- 3520 Ideologies in Modern European History (3-0)**
Lectures, discussion, and reports.
- 3521 English Historical Writing (3-0)**
Lectures, discussion, and reports.
- 3550 Modernization and the Middle East (3-0)**
Lectures, discussion, and reports.
- 3581 SEMINAR: Historical Method and Historiography* (3-0)**
- 3582 SEMINAR: Studies in European History† (3-0)**
- 3583 SEMINAR: History of England† (3-0)**
- 3584 SEMINAR: Colonial and Revolutionary America (3-0)**
- 3585 SEMINAR: American Diplomatic History (3-0)**
- 3586 SEMINAR: American Intellectual History† (3-0)**
- 3587 SEMINAR: Modern America† (3-0)**
- 3588 SEMINAR: American South† (3-0)**
- 3589 SEMINAR: Civil War and Reconstruction† (3-0)**
- 3590 SEMINAR: Texas History† (3-0)**
- 3591 SEMINAR: History of Mexico†§ (3-0)**
- 3592 SEMINAR: American West† (3-0)**
- 3595 History and Historians (3-0)**
- 3597 Teaching History in Secondary and Elementary Schools (3-0)**
- 3598-99 Thesis Course for the Master's Degree**

*Required of all History majors in the M.A. Degree, and offered in the fall semester and once in the summer.

†May be repeated when topic varies.

§A reading knowledge of Spanish is required.

L I N G U I S T I C S

RAY PAST, *Chairman*

Professors BLANSITT, COLTHARP, ORNSTEIN, PAST, SHARP;

Assistant Professors D. NATALICIO, ELERICK;

Instructors COTTON, GARCIA, HAYDEN, E. JOHNSON, RAMIREZ, SPRINGSTEAD;

Teaching Assistants AHOUSE, DIAMOND, FALLEN, T. JOHNSON

B.A. Degree — Specific course requirements for the linguistics major are Spanish 3202 with a grade of "B" or competence in Spanish, to be judged by the Department of Modern Languages, equivalent to a "Good" rating on the scale of the Modern Language Association; Ling. 3110, 3220, 3307, 3309 (or 3490), 3471 and 3419. In addition, the student must choose a minimum of six hours from the following: Ling. 3308, 3400, or 3401 (he may only count one of these), 3471 (provided the topic differs from when it was previously taken), 3454, 3472, 3494, 3395, and 3309 or 3490 (whichever was not taken in the required courses listed above). The following minor is required: 1. Competence through 3202 in a second European language, and 4103-04 or the equivalent in a non-Indo-European language.

1101-02 Language Laboratory (0-3)

4101-02 English for Speakers of Other Languages (5-3)

Fundamentals of oral and written communication in English, practice in handling English sentence patterns, practice in vocabulary enrichment, and drill in mastering the phonemic structure of English. (May not be counted in addition to English 3101-02.)

4103-04 Non-Indo-European Language (5-3)

An intensive course designed to enable the student to master the fundamentals of a major non-Indo-European language. Oral drill. Basic structure, reading of elementary texts, laboratory. Repeatable for credit as the language varies.

3110 Phonetics (3-0)

The study of speech sounds with emphasis on their articulation and transcription. Attention is *not* limited to the speech sounds of English.

3220 An Introduction to Linguistics (3-0)

Introduction to modern language studies with emphasis on contemporary as opposed to historical linguistics. (May be taken as English 3220.)

3307 The Structure of English (3-0)

Investigation of Modern English: a study of modern analyses of the language. *Recommended background:* Ling. 3110 or Ling. 3220. (May be taken as English 3307.)

3308 Methods of Teaching English as a Foreign Language (3-0)

Modern foreign language teaching techniques with particular attention to the problems of the learner of English. Theories of language learning and testing, and the practical use of audio-visual equipment. *Recommended background:* Ling. 3220 or Ling. 3307. (May be taken as English 3308.)

3309 The Structure of Spanish (3-0)

A study of the structure of Spanish, using modern linguistic models. Attention will be paid to the phonology, morphology and syntax of the language. Conducted in Spanish. *Prerequisite:* Spanish 3202 or equivalent. (May be taken as Spanish 3309.)

- 3395 Linguistics in the Classroom (3-0)**
A study of the use of linguistics theory in the teaching of English. (Meets the requirement of Linguistics 3307 for secondary education majors.)
- 3400 Teaching Spanish (3-0)**
The application of modern linguistic methods to the effective teaching of Spanish, with particular emphasis on the oral language. Conducted in Spanish. *Prerequisite:* Six hours advanced Spanish or six hours Spanish-oriented linguistics courses, or permission of department chairman. (Same as Spanish 3400.)
- 3401 Methods of Foreign Language Instruction (3-0)**
Practical application of linguistic principles to the teaching of foreign languages. *Prerequisite:* Completion of course 3202 or the equivalent in a foreign language.
- 3419 English Historical Linguistics (3-0)**
The development of English from its beginnings to Modern English. A study of the changes in the phonological, morphological and syntactical systems. *Prerequisite:* Six hours sophomore English or Ling. 3220.
- 3454 Psycholinguistics (3-0)**
A study of the psychological factors in language behavior, including attention to theories of language learning. *Prerequisite:* Permission of department chairman or instructor.
- 3471 Studies in Linguistics (3-0)**
Topic to be discussed will be selected. May be repeated for credit when topic varies. *Prerequisite:* Six hours of 3300-3400 linguistics or permission of the department chairman.
- 3472 Contrastive Linguistics, Spanish/English (3-0)**
A contrastive study of the systems of the two languages: the phonology, the morphology, the syntax. Conducted in both languages. *Prerequisite:* Spanish 3202 or equivalent. *Recommended background:* Ling. 3220 or 3309.
- 3490 Studies in Spanish as Language (3-0)**
Topic to be discussed will be selected. May be repeated for credit when topic varies. Conducted in Spanish. *Prerequisite:* Six hours advanced Spanish or six hours Spanish-oriented linguistics courses, or permission of department chairman.
- 3494 History of the Spanish Language (3-0)**
A survey of the phonological, morphological and syntactical changes from Vulgar Latin to modern Spanish. *Prerequisite:* Six hours of advanced Spanish or six hours Spanish-oriented linguistics courses, or permission of department chairman. (Same as Spanish 3494.)

MASS COMMUNICATION

JOHN J. MIDDAGH, *Chairman* (Journalism)

JOHN SIQUEIROS, *Chairman* (Broadcasting)

Professor Emeritus VIRGIL C. HICKS

Professor MIDDAGH; *Assistant Professors* SIQUEIROS, LEWELS;

Instructors BROWN, FENTON; *Teaching Assistants* MALLOY

NEDOW, RETTIG, ROSE, STAFFORD.

B.A. Degree — Specific courses required for the Journalism Major are Journalism 3101, 3102, 3201, 3202, 4207, 3305, 3312, 3350 and six additional advanced hours. Specific courses required for the Broadcasting Major are 30 semester hours of RATV courses, including RATV 3102*, 3214-15, 3401, 3402, 3430-31, and History 3325.

*RATV 3102 may be waived upon consent of the Chairman for any student demonstrating an extensive knowledge of electronics or physics.

JOURNALISM

For Undergraduates

General prerequisite: Junior standing for all 3300 or 3400 level courses.

3101 History and Principles of Journalism (3-0)

History of American Journalism and its role in society with emphasis on newspaper journalism. Required of all students majoring in journalism.

3102 Mass Media and Society (3-0)

A study of the nature and function of mass communication and an appraisal of the performance of the mass media in society in general with emphasis on the United States. Required of all students majoring in journalism.

3201 News Gathering and Reporting (2-4)

Instruction and intensive practice in writing news stories under deadline pressure. Provides initial experience in use of wire-service style, interviewing, and fact-gathering techniques. Required of all students majoring in journalism. *Prerequisite:* Sophomore standing including English 3101-02. Ability to type 30 words per minute. Prerequisite to 3202.

3202 Advanced News Gathering and Reporting (2-4)

Emphasis on developing and writing news stories of substance and depth. Study of the investigative reporter's techniques for gathering public intelligence. Practice in learning to deal systematically with quantities of information. Evaluation of conflict in points of view. Required of all students majoring in journalism. *Prerequisite:* Journalism 3201.

3203 Current Events (3-0)

A study of current events in the daily newspaper and interpretation of these current events in regard to the social welfare, future and progress of the world. *Prerequisite:* Sophomore standing.

4207 Elementary Photography (3-3)

Instruction and practice in the processes of News Photography. Discussion of lenses and cameras, along with the actual photographic process. Capabilities of the press camera; exposure and development of film; printing and finding news pictures. *Prerequisite:* Sophomore standing or permission of instructor based on applicant's previous experience in photography.

3303 The Special Article (3-0)

Methods of gathering material for newspapers and magazine feature stories, through interviews, research, and observation; study of feature story form and style; discussion of markets for literary material; practice in writing feature stories. *Prerequisite:* Journalism 3201 or 3202, or English 3211-12.

- 3305 News Editing (3-0)**
 Instruction and practice in newspaper deskwork. Preparation of local copy, wire service copy, headlines and make-up. Work on a newspaper copydesk. Emphasis on news judgment and social responsibility. Required of all journalism majors. *Prerequisite:* Journalism 3201, 3202.
- 3308 Fields of Photography (2-3)**
 A continuation of Elementary News Photography with special emphasis on press photography. A survey of the various fields of photography including a practical working knowledge of cameras and their most effective uses. *Prerequisite:* Journalism 4207 or permission of the instructor, based on applicant's previous experience with camera and darkroom.
- 3312 Editorial Writing and Page Direction (3-0)**
 Instruction and practice in writing newspaper editorials and page columns. Early emphasis on structure and style, make-up, and policies. Practice in writing the signed column. Required of all students majoring in Journalism. *Prerequisite:* Junior standing or consent of the head of the department.
- 3313 Literature of Journalism (3-0)**
 A comprehensive review of books about mass communication. *Prerequisite:* Junior standing.
- 3330 Journalism High School Publications Production (3-0)**
 Newspaper and yearbook problems and how to face them. The riddle of censorship and law of the press, with stress on libel. Use of photography, typography and color. Advertising sales methods. Designed to help those who might have to handle school publications. *Prerequisite:* Junior standing.
- 3350 Fundamentals of Advertising (3-0)**
 Survey of advertising principles used in all media of communications. Discussion of advertising's role in small and large business enterprises. *Prerequisite:* Junior standing or consent of the head of the department.
- 3351 Advertising Layout and Copy (2-3)**
 Basic course in understanding production and handling of advertisements. Step by step production of typical ad; stresses creativity, mechanical makeup, final reproduction and evaluation. Agency and trade terms used to specify methods and desired results. (Junior standing and "Typography" course).
- 3352 Public Relations (3-0)**
 Principles, techniques, and methods used in public relations; necessity and significance in the free enterprise system. Relationships include national, state and local governments; employees; customers; suppliers; social and religion institutions. *Prerequisite:* Junior standing or consent of the head of the department.
- 3353 Magazine - Publications Production (2-3)**
 Production of small magazines through offset reproduction. Stresses basics of organization, layout, design, and copy fitting. Basics of color runs and color separations. Includes working with art and photos and business side of publications. Required of students desiring to fill top positions in El Burro and Flowsheet. (Required: "Typography" and "Adv. Layout and Copy"), Junior level.
- 3354 Photo - Journalism and Professional Practice (2-3)**
 Developing the photo story and editing to obtain professional type magazine or newspaper layout. Stresses creative viewpoint and use of equipment to obtain desired result. Problems in "available" and tungsten lighting. Special use of flash bulb and electronic lighting. Use of 35mm, press type, and view cameras. *Prerequisite:* Junior standing and 3308.
- 3355 Communication Law (3-0)**
 A consideration of the legal philosophy bearing on the mass media, tracing the development of press freedom as well as legal restrictions on the media today. *Prerequisite:* Junior standing.
- 3356 Foreign Press (3-0)**
 A comparison of modern press systems of the world focusing on each country's internal communications problems with emphasis on current events relating to those problems. Special studies in the Latin American (especially Mexican) press. *Prerequisite:* Junior standing.

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3401 Public Affairs in the News (3-0)

Panel discussions, lectures and field visits comprise this course, which is primarily designed for the senior student needing advanced elective credit having a direct relationship to his major area of study. How the operations of government, politics, the courts, labor and business are reported and interpreted in the news will be studied. *Prerequisite:* Junior standing or consent of the head of the department.

3402 Studies in Mass Communication

Subject to be selected by professor in charge for special work in advanced fields. Recommended prerequisite: Journalism 3312 or 3305. *Prerequisite:* Six hours advanced Journalism or Radio-Television.

3404 Cinematography I (2-3)

Introduction to professional 16mm cameras. Basics and practice in cameras, exposure, lenses, basic processing, editing, and other production methods. *Required:* Senior standing and 4207 or 3308.

3405 International Communication (3-0)

A study of the process of communication between nations to include an analysis of the functions of international wire services, communications satellites, propaganda and cultural exchange programs, with a consideration of barriers to international understanding. *Prerequisite:* Senior standing.

3418 Current Events in Relation to Classroom Teachers Use in Secondary School (3-0)

A study of current events in the daily newspapers, national news magazines, and radio, and interpretation of these current events in regard to the social development of the secondary school pupil. *Prerequisite:* Junior standing or consent of the head of the department.

UNIVERSITY PUBLICATIONS

For Undergraduates

1104 and 1204 Publications (0-3)

For work on the staff of one of the University's student publications. Students taking the course must work on the staff of the Prospector, El Burro, or the Flow-sheet at prescribed periods under teacher-adviser supervision. May be repeated for credit to the extent of six hours toward graduation. No senior student may take the 1104 course for credit towards graduation.

BROADCASTING

For Undergraduates

3101 Survey of Broadcasting (3-0)

A survey of world systems of broadcasting with emphasis upon the history, Federal regulations and philosophies of broadcasting in the United States.

3102 Broadcast Theory, Facilities and Equipment (3-0)

An introduction to the physical theory of radio and television. This course approaches the subject assuming the student has little or no background in math, electronics or physics.

3103 Elementary Radio Production

An introduction to all phases of audio operations including familiarization with the equipment and the techniques of audio production. This course is a prerequisite to all one-hour activity classes.

3105 Radio-Television News (3-0)

News reporting and writing for radio and television. Processing A.P. wire copy. Skills of the radio-television news announcer.

3205 Concepts of Radio and Television (3-0)

General orientation and familiarization of radio-television in mass communication. Includes study of the influence and importance of the radio and television industry. Stresses production and studio operations and broadcast media's approach to news and advertising. This course is required of all journalism students, and may not be taken for credit by RATV majors. Students completing this course will receive no credit for RATV 3101.

- 3214 Radio-Television Announcing (3-0)**
A study of the announcer-newscaster's responsibilities as a communicator. Analysis of announcer skills. Drills in radio and television announcing and the development of an effective on-the-air personality.
- 3215 Telecommunications (3-0)**
Writing for radio and television. Creating, writing and producing effective commercial continuity.
- 3305 News Editing (3-0)**
An advanced course in gathering, processing, and reporting news for radio and television. *Prerequisite:* Junior standing.
- 3320 TV Production (2-3)**
An introduction to the equipment and production facilities of television. Beginning problems in television production. *Prerequisite:* Six hours of radio-television courses or Junior standing.
- 3321 TV Production (2-3)**
A continuation of Television Production I. Advanced problems in television production. The skills of the television producer-director. *Prerequisite:* Six hours of radio-television courses or Junior standing.
- 3323 Concepts of Instructional Television (3-0)**
The importance and scope of instructional TV in America with special emphasis on methods of ITV production. *Prerequisite:* Six hours of RATV courses or junior standing.
- 3401 Social Aspects of Broadcasting (3-0)**
A survey of current research detailing the impact of broadcasting on the changing social and cultural patterns in America. *Prerequisite:* Junior standing, or consent of the chairman.
- 3402 Idea, Form and Medium (3-0)**
An investigation of the relationship between the idea to be expressed, the form of the expression and the medium chosen. This relationship will include specific studies in market sampling, demographics, survey computerization and promotional merchandising at the local, regional and national level. *Prerequisite:* Junior standing, or the consent of the chairman.
- 3404 Cinematography (2-3)**
Use of 16 mm motor driven professional motion picture cameras to record news events and documentaries for television use. Stresses basics of production, filming, editing, splicing, meters-exposures, zoom lenses, film choices, processing, lighting and sound-on-film. Course project by crews of 3-4 students consists of a 10 minute documentary. Students provide film and processing costs. *Prerequisite:* Senior standing and Journalism 4207 or consent of instructor.
- 3430 Radio-Television Station Management (2-3)**
Complete survey of management problems in the radio-television industry. Information relating to network affiliation, staff training, public service policies, systems of records, legal restrictions. Survey of job opportunities. Counselling with industry personnel. Required of all radio-television majors. *Prerequisite:* Six hours of radio-television courses or Junior standing.
- 3431 Seminar in Telecommunications (2-3)**
Studies, discussions and evaluations of the literature of broadcasting. Research problems in mass communications. *Prerequisite:* Six hours of radio-television courses or Junior standing.
- 3412 Classroom Use of Audio-Visual Equipment and Materials (3-0)**
Consideration of various kinds of audio-visual equipment and materials in relation to classroom instruction in elementary and secondary education. *Prerequisite:* Junior standing.

RADIO STATION KVOF and KTEP

For Undergraduates

- 1104-05 Radio Station KVOF (0-3)**
Work on the staff of Radio Station KVOF. *Prerequisite:* RATV 3103 or consent of department chairman.

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1204-05 Radio Station KVOF (0-3)

Work on the staff of Radio Station KVOF. *Prerequisite:* RATV 3103 or consent of department chairman.

1304-05 Radio Station KTEP (0-3)

Work on Radio Station KTEP with increased responsibility. *Prerequisite:* RATV 3103 or consent of department chairman.

1404-05 Radio Station KTEP (0-3)

Work on Radio Station KTEP with increased responsibility. *Prerequisite:* RATV 3103 or consent of department chairman.

MILITARY SCIENCE

COLONEL JAMES G. CHRISTIANSEN, *Chairman*
Professor COLONEL CHRISTIANSEN
Assistant Professors MAJOR DALES, MAJOR GARCIA,
CAPTAIN SCHUYLER, CAPTAIN SANDERS;
Instructor SERGEANT MAJOR SECURA.

GENERAL: Courses offered by this department are designed to produce commissioned officers, who by their education, training, and demonstrated leadership qualities, are considered suitable for continued development as officers in the United States Army, or in the civilian career of their choice. Army ROTC Courses provide leadership training and experience that is not duplicated in any other college course. Instruction is designed to develop self-assurance, personal discipline, physical stamina, bearing, acceptance of responsibility, and other basic qualities required of an Army Officer. These same qualities also contribute significantly to success in civilian careers.

Military Science Courses are offered during the fall and spring semesters only. The first two years (Military Science 1101-02 and 2201-02) form the Basic Course and are normally taken during freshman and sophomore years. For Freshmen students who did not enroll in MS 1101 in the fall semester, both MS 1101 and 1102 are offered in the spring semester. The second two years (Military Science 3301-02 and 3401-02) form the Advanced Course and are taken during the student's junior and senior years. Military Science (ROTC) is elective.

ELIGIBILITY: *Basic Course.* To enroll in ROTC, a student must be a full-time student at U.T. El Paso or the El Paso Community College. Normally the ROTC student begins Military Science courses during his freshman year. Sophomores are permitted to enroll in the basic course with the permission of the Professor of Military Science (PMS). Enrollment is limited to students who can qualify for a degree prior to their 28th birthday. Credit for all or a part of the basic course may be granted by the PMS for participation in high school ROTC or for active military service of four or more months.

Two Year Program. Students who did not enroll in the basic course or who cannot be given credit for the basic course by virtue of active military service or participation in high school ROTC, may qualify for the Advanced Course by attending a six week Basic Summer Training Camp. Applicants for the camp should visit the Department of Military Science in February to secure application forms and schedule a physical examination. The student must have a minimum of two years remaining prior to completion of a baccalaureate or advanced degree.

Advanced Course. Admission requires selection by the PMS, medical fitness and ability to qualify for a degree prior to the 28th birthday. Prerequisite is completion of the Basic Course or Basic Summer Training Camp, or credit for the Basic Course because of military service or high school ROTC. The student is required to enlist in the Army Reserve and execute a contract with the government to accept a commission in the Army upon graduation. The active duty commitment may be as little as three months and will not exceed two years.

SCHOLARSHIPS: *Four-year Scholarships.* Approximately a thousand four-year Army ROTC scholarships are available annually. These scholarships are awarded on a national competitive basis to high school graduates. Interested high school seniors should obtain Application Requests from their counselors and submit the request by December. Application forms are also available by writing to the Military Science Department.

Three-year Scholarships. Due to a special program, U.T. El Paso is allocated five three-year Army ROTC Scholarships each year. In addition, other scholarships are available on a national competitive basis. Freshmen enrolled in ROTC during the second semester are eligible for these scholarships. Application is made in February through the Military Science Department.

Two-year Scholarships. U.T. El Paso is allocated one two-year Army ROTC Scholarship; others are available on a national competitive basis. Sophomores enrolled in

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ROTC are eligible. Application is made in December through the Military Science Department. Other two-year scholarships are available on a competitive basis to students attending the Basic Summer Training Camp. Application is made at Camp.

One-year Scholarships. Available to students who have completed MS III. Application is made in May through the Military Science Department.

PAY AND ALLOWANCES: All students enrolled in ROTC are furnished summer and winter uniforms, textbooks, and equipment on a loan basis. A \$20.00 deposit is required at initial registration to cover loss or damage to government and/or university property. This deposit, less charges, is refunded upon completion of Military Science studies. All Advance Course cadets are paid \$100.00 per month for a maximum of twenty months, excluding the six week Advanced Summer Training Camp, where pay is at the rate of \$265.50 per month. Army ROTC Scholarship cadets have their tuition, required fees, textbooks, and essential classroom supplies paid for by the government. Additionally ROTC Scholarship recipients are paid \$100.00 per month during the fall and spring semesters of their freshman and sophomore years. The government also provides a mileage allowance of six cents per mile to and from Basic and Advanced Summer Training Camps. Pay at the six week Basic Summer Training Camp, attended by candidates for the Two-Year ROTC Program, is at the rate of \$144.00 per month.

FLIGHT TRAINING: Flight training at a local flying school is available to qualified ROTC Cadets in their senior year. A more rigid physical examination is required and special mental screening tests must be passed. Flight training cadets must take flight instruction on their own time. The ROTC Flight Training Program seeks to qualify the individual for a Federal Aviation Agency Private Pilot's License. All instructional costs are paid by the government. Selected ROTC Flight Training Cadets must agree to serve on active duty for three years and to volunteer for Army Aviation training.

COMMISSIONS OFFERED: Upon successful completion of all Military Science studies and requirements for a Baccalaureate Degree, a cadet is tendered a commission as a Second Lieutenant in the United States Army Reserve and will be required to serve on active duty, not to exceed two years. He may request that his active duty be for a period of only three months. Cadets who have completed ROTC Flight Training are required to serve for three years. Students who qualify as Distinguished Military Students at the end of their junior year and maintain the prescribed academic and leadership standards through Advanced Training Camp and their senior year, will be designated as Distinguished Military Graduates of U.T. El Paso. Distinguished Military Graduates may apply and qualify for a Regular Army Commission — the same as given at the United States Military Academy at West Point. Since U.T. El Paso offers a General Military Science Curriculum, a commission in most branches of the Army is obtainable. Following graduation, the newly commissioned officer is sent to an Orientation Course of about nine weeks to qualify him in his Branch, and then completes his tour of active duty through challenging assignments overseas and in the United States. Delays in call to active duty are generally obtainable for those students who wish to pursue graduate studies leading to a Master's Degree.

BASIC COURSE

1101-02 Military Science I (1-1)

Organization of the Army and ROTC; United States Army and National Security; Military History; and Leadership Laboratory. Academic credit: One hour per semester.

2201-02 Military Science II (2-1)

Military topography and graphics; American Military History; and Leadership Laboratory. Academic credit: Two hours per semester.

ADVANCED COURSE

3301-02 Military Science III (3-1)

Leadership; Military Teaching Principles; Branches of the Army; Small Unit Tactics and Communications; and Leadership Laboratory. *Prerequisite:* Junior standing, basic course or equivalent military training, and selection by Professor of Military Science. Academic credit: Three hours per semester.

3401-02 Military Science IV (3-1)

Operations; Logistics; Army Administration; Military Justice; The Role of the United States in World Affairs; Service Orientation; and Leadership Laboratory. *Prerequisite:* Military Science 3301-02. Academic credit: Three hours per semester.

MODERN LANGUAGES

GEORGE W. AYER, *Chairman*

Professors AYER, ORNSTEIN, SHARP, SMILEY; *Associate Professors* CHRISTIAN, EWTON, RUSSELL, TAPPAN; *Assistant Professors* ASTIAZARAN, BAILEY, BEYER, BORNSCHEUER, BREWER, CASTLE, ISOTOV, LANDY, NATALICIO, NAVAR, PEREZ, F. RODRIGUEZ, SCRUGGS, WALKER;
Instructors GOLDBERG, IRWIN, KLUCK, ORTEGA.

Incoming Students.

Students with a knowledge of French, German, Russian, or Spanish, should determine their placement according to the paragraph below.

Students with no knowledge of the language: register for 4101.

Examinations for Placement, with or without course credit.

All students with a knowledge of a foreign language, however acquired, who have not taken any college course in the language, should take a test for proper placement, or for placement and semester-hour credit. The recommended procedure is to take in high school the Achievement Test of the College Entrance Examination Board (CEEB). Scores will be used for placement in the proper University course, and can give credit for 4101 (4 semester hours) or for 4101-02 (8 semester hours). Achievement Test scores will be accepted in French, German, Spanish and Russian. Students who were unable to take the test in high school should apply to the Counselling Center, Student Union Building 103w. A fee (currently \$3.00) is charged.

A different test, given without charge by the Department of Modern Languages, is used for placement only. This test gives no semester-hour credit for any courses skipped. Transfer students and students whose study has been interrupted may use the test score to guide their registration.

Credit for 3201 or 3201-02 may be earned through the Advanced Placement Examinations of the College Board, given in high schools with special Advanced Placement programs. Students may also qualify to attempt to earn credit for 3201-02 through advanced placement examinations given by the Department.

General Foreign Language Requirement for all B.A. Degrees

All programs leading to the B.A. degree require completion of course 3202 in a foreign language. The requirement is not a fixed number of semester hours, but a level of achievement. The 4101-02, 3201-02 course sequence can be reduced by successful examinations (see above). The requirement may be completed in French, German, Portuguese, Russian or Spanish. Some departments require their majors to take a certain foreign language.

Major Requirements in Modern Languages; Definition of "advanced hours"

Requirements for majors in French, German and Spanish are set forth below in terms of advanced hours (semester hours earned in courses numbered 3300 or above). Completion of course 3202 is the prerequisite for all 3300 courses. This prerequisite can be met by completing the 4101-02, 3201-02 sequence or by examination, as outlined above.

B.A. Degree in French, German or Spanish (without teacher certification)

Twenty-one semester hours of advanced courses in the major including at least nine hours of 3400-level courses. Courses 3201-02 in a second foreign language.

B.A. Degree in French, German or Spanish (with teacher certification)**

Twenty-one semester hours of advanced courses in the major, including: for French and German majors, 3301, 3303, 3357 and 3401; for Spanish majors, 3301 or 3303, 3302, 3320 or 3322, 3357, 3400 or 3401, and 3472.

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Linguistics Majors, or Spanish majors interested in linguistics.

Note that the following courses may be taken for credit either in Spanish or Linguistics: Spanish (or Linguistics) 3309, 3400, 3401, 3472, 3492, 3493.

FRENCH **For Undergraduates**

4101-02 Fundamentals of French (5-0)

Oral drill, dictation, grammar, reading of elementary and intermediate texts, laboratory and written exercises.

3108 Conversational French

Conversation and spoken drill with emphasis on the language used in modern everyday situations. Oral discussions on current topics, vocabulary building. *Prerequisite:* French 4102 or consent of the instructor.

3201-02 Intermediate French (3-0)

Readings from standard French authors. Oral and written work in French; grammar review. *Prerequisite:* French 4102.

3301 Introduction to French Literature I (3-0)

Introduction to French Literature through the Eighteenth Century. Main literary trends and principal writers from the Middle Ages through the Enlightenment. *Prerequisite:* French 3202.

3303 Introduction to French Literature II (3-0)

Introduction to French Literature of the Nineteenth and Twentieth Centuries. Main literary trends and principal writers from the Romantic Period to the present. *Prerequisite:* French 3202.

3320 French Civilization (3-0)

A survey of the political, social, intellectual and artistic history of France. *Prerequisite:* French 3202.

3357 Advanced Composition and Grammar Review (3-0)

Prerequisite: French 3202.

For Undergraduates and Graduates

3401 Methods of Foreign Language Instruction (3-0)

Practical application of linguistic principles to the teaching of modern foreign languages. Classroom techniques, development and evaluation of teaching and testing materials appropriate to the written and spoken languages. May not be counted for credit in addition to German 3401, Spanish 3401, or Linguistics 3401. *Prerequisite:* 6 hours of advanced courses in French.

3431 Sixteenth Century French Literature (3-0)

Rabelais, Ronsard, Montaigne, and others. *Prerequisite:* Six hours of advanced French.

3432 The Classical Period (3-0)

Representative authors of the seventeenth century, including Corneille, Moliere and Racine. *Prerequisite:* 6 hours of advanced French.

3433 Masterpieces of French Literature (3-0)

Selected masterpieces of French literature, studied in depth. *Prerequisite:* 6 hours of advanced French.

3434 Eighteenth Century French Literature (3-0)

Rousseau, Diderot, Voltaire, and others. *Prerequisite:* 6 hours of advanced French.

3435 Nineteenth Century Novel: Early Period (3-0)

Hugo, Stendhal, Balzac, and others. *Prerequisite:* 6 hours of advanced French.

3437 Late Nineteenth and Twentieth Century Novel (3-0)

Flaubert, Zola, Daudet, France, and others. *Prerequisite:* 6 hours of advanced French.

**For other requirements concerning teacher certification, including a second teaching field and the required sequence of Education courses, the student should consult with the School of Education.*

- 3439 The Short Story (3-0)**
Prerequisite: 6 hours of advanced French.
- 3490 Senior Seminar (3-0)**
Prerequisite: Six hours of advanced French.
 May be repeated for credit when topics vary.
- 3441 Nineteenth Century Drama (3-0)**
 Hugo, Musset, Dumas, Becque, and others. *Prerequisite:* 6 hours of advanced French.
- 3458 Contemporary Literature (3-0)**
 Novel and drama after 1937. *Prerequisite:* 6 hours of advanced French.
- 3477 Lyric Poetry (3-0)**
Prerequisite: 6 hours of advanced French.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve hours of advanced courses in French and a Bachelor's degree.

- 3550 Old French Literature (3-0)**
 Queste del Graal, Perceval, Chanson de Roland, etc. *Prerequisite:* Twelve hours of advanced French; also open to graduate students of English having a reading knowledge of French.
- 3557 The Historical Phonology of French (3-0)**
 The study of sound and word changes from Latin to Modern French. *Prerequisite:* Twelve hours of advanced French or of Linguistics.
- 3590 Seminar (3-0)**
 May be repeated for credit.
- 3591 Graduate Reading Course: Seminar (3-0)**
 May be repeated for credit.

GERMAN For Undergraduates

- 4101-02 Fundamentals of German (5-0)**
 Oral drill, dictation, grammar, reading of elementary and intermediate texts, laboratory and written exercises.
- 3103-04 Reading German (3-0)**
 Fundamentals of grammar, reading of elementary texts, reading and translation of intermediate texts in various fields of science and technology. Primarily for science majors. May not be used to fulfill language requirement for the Bachelor of Arts Degree.
- 3108 Conversational German**
 Conversation and spoken drill with emphasis on the language used in modern everyday situations. Oral discussions on current topics, vocabulary building. *Prerequisite:* German 4102 or consent of the instructor.
- 3201-02 Intermediate German (3-0)**
 Readings from the nineteenth and twentieth centuries. Oral and written summaries, some grammar review. *Prerequisite:* German 4102.
- 3301 Introduction to German Literature before 1750**
 Main literary trends and principal writers from the beginnings through the Enlightenment. *Prerequisite:* German 3202.
- 3303 Introduction to German Literature since 1750**
 Main literary trends and principal writers from the birth of Goethe to the present. *Prerequisite:* German 3202.
- 3314 German Literary Criticism (3-0)**
 An introduction to literary criticism and readings from German literary theorists. Conducted in German. *Prerequisite:* German 3202.

School of Liberal Arts

- 3320 German Civilization**
A survey of the political, social, intellectual and artistic history of Germany. *Prerequisite:* German 3202.
- 3357 Advanced Composition and Grammar Review (3-0)**
Prerequisite: German 3202.

For Undergraduates and Graduates

- 3401 Methods of Foreign Language Instruction (3-0)**
Practical application of linguistic principles to the teaching of modern foreign languages. Classroom techniques, development and evaluation of teaching and testing materials appropriate to the written and spoken languages. May not be counted for credit in addition to French 3401, Spanish 3401 or Linguistics 3401. *Prerequisite:* 6 hours of advanced German.
- 3433 Masterpieces of German Literature (3-0)**
Intensive readings from masterpieces of German literature. At least four complete works from such authors as Goethe, Schiller, Kleist, etc. *Prerequisite:* 6 hours of advanced German.
- 3439 The German Novelle and Short Story (3-0)**
A study of the shorter fictional forms in German from the time of Goethe to the present. *Prerequisite:* 6 hours of advanced German.
- 3441 Modern German Drama (3-0)**
A study of the modern German drama through the works of such authors as Büchner, Grillparzer, Hebbel, Hauptmann, etc. *Prerequisite:* 6 hours of advanced German.
- 3450 Medieval Literature (3-0)**
Readings in German literature from its beginnings to the end of the Middle Ages. Middle High German works will be read in the original. *Prerequisite:* 6 hours of advanced German.
- 3458 Contemporary German Literature (3-0)**
Emphasis on the novel with some attention to the contemporary drama. Study of such authors as Hesse, Mann, Kafka, Grass, etc. *Prerequisite:* 6 hours of advanced German.
- 3477 German Poetry (3-0)**
German poetry from the Middle Ages to the twentieth century. *Prerequisite:* 6 hours of advanced German.
- 3490 Senior Seminar (3-0)**
May be repeated when topics vary. *Prerequisite:* Six hours of advanced German or consent of instructor.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve hours of advanced courses in German and a Bachelor's degree.

- 3590 Seminar (3-0)**
May be repeated when topics vary.

ITALIAN

- 4101-02 Fundamentals of Italian**
A beginning course with emphasis on pronunciation, the basic elements of grammar, and practice in understanding, speaking, reading and writing everyday Italian with some facility.
- 3201-02 Intermediate Italian**
Readings from modern writers; oral and written work in Italian; grammar review. *Prerequisite:* Italian 4102 or equivalent.

JAPANESE**4101-02 Fundamentals of Japanese (5-0)**

An intensive course designed to enable the serious student to master the fundamentals of a major non Indo-European language. Oral drill with a native informant. Basic structure; reading of elementary texts, language laboratory.

LATIN**4103-04 Fundamentals of Latin (reading emphasis) (5-0)**

Reading of elementary and intermediate texts; grammar, written exercises. Intended to provide a basis for advanced study in Romance Languages.

PORTUGUESE**4101-02 Fundamentals of Portuguese (5-0)**

A beginning course with emphasis on pronunciation, the basic elements of grammar, and practice in speaking understanding, speaking, reading and writing everyday Portuguese with some facility.

3201-02 Intermediate Portuguese (3-0)

Readings from modern Brazilian and Portuguese writers; oral and written work in Portuguese; grammar review. *Prerequisite:* Portuguese 4102 or equivalent.

3203 Reading Portuguese (3-0)

A course intended to provide students who know Spanish with a reading knowledge of Portuguese. Graded readings in Brazilian prose and poetry, instruction and drill in basic grammar and pronunciation. *Prerequisite:* Spanish 3202 or equivalent.

3321 Introduction to Brazilian Literature (3-0)

An introductory survey of Brazilian literature and culture. Selected readings from major works of Brazilian prose and poetry. Conducted in Portuguese. *Prerequisite:* Portuguese 3202 or 3203.

RUSSIAN**For Undergraduates****4101-02 Fundamentals of Russian (5-0)**

Basic course for beginners stressing elementary grammar, drill in pronunciation, idiomatic expressions, writing, and reading of simple fiction.

3201-02 Intermediate Russian (3-0)

Conversation, composition, reading of simple fiction, grammar review. Grammatical, oral, and written practice based on reading material. *Prerequisite:* Russian 4102.

3301 Nineteenth Century Russian Literature (3-0)

Major works of the 19th century: Pushkin, Lermontov, Gogol, Dostoevsky, Tolstoy, Chekhov, and the various trends at the beginning of the 20th century: Symbolism, Acmeism, Futurism, and other movements. *Prerequisite:* Russian 3202. Taught in Russian.

3303 Soviet Russian Literature (3-0)

Major developments in Russian literature since 1917: representative works by Gorky, Sholokhov, Olesha, Mayakovskii, Eshiu, and others. *Prerequisite:* Russian 3202. Taught in Russian.

3220 Russian Civilization (3-0)

The comparative aesthetics and development of art, film, music, architecture, and literature within the context of Russian history, philosophy, religion and government. Taught in English.

SPANISH**For Undergraduates****4101-02 Fundamentals of Spanish (5-0)**

Oral drill, dictation, grammar, reading of elementary and intermediate texts, laboratory and written exercises.

3108 Conversational Spanish (3-0)

Conversation and spoken drill with emphasis on the language used in modern everyday situations. Oral discussions on current topics, vocabulary building. *Prerequisite:* Spanish 4102 or consent of instructor.

- 3201-02 Intermediate Spanish (3-0)**
Readings from the nineteenth and twentieth centuries. Oral and written summaries, some grammar review. *Prerequisite:* Spanish 4102.
- 3301 Introduction to Spanish Literature before 1700 (3-0)**
Main literary trends and principal writers from the Middle Ages through the Golden Age. *Prerequisite:* Spanish 3202.
- 3302 Introduction to Spanish American Literature through Modernism.**
Main literary trends and principal writers in Spanish America from the sixteenth century through Modernism. *Prerequisite:* Spanish 3202 or the equivalent.
- 3303 Introduction to Spanish Literature since 1700 (3-0)**
Main literary trends and principal writers from the Eighteenth Century to the Contemporary period. *Prerequisite:* Spanish 3202.
- 3304 Introduction to Spanish American Literature since Modernism.**
Main literary trends and principal writers in Spanish America since Modernism. *Prerequisite:* Spanish 3202 or the equivalent.
- 3309 The Structure of Spanish (3-0)**
A study of the structure of Spanish, using modern linguistic models, with attention to phonology, morphology and syntax. Same as Linguistics 3309. *Prerequisite:* Spanish 3202.
- 3320 Spanish Civilization (3-0)**
A survey of the political, social, intellectual and artistic history of Spain. *Prerequisite:* Spanish 3202.
- 3322 Latin American Culture**
An interpretation of the culture of Latin America through contemporary literature. Conducted in Spanish. *Prerequisite:* Spanish 3202.
- 3357 Advanced Composition and Grammar Review (3-0)**
Prerequisite: Spanish 3202

For Undergraduates and Graduates

- 3400 Teaching Spanish in the Southwest (3-0)**
A course designed to acquaint prospective teachers of Spanish in the Southwest with (1) practical application of modern linguistics to the teaching of Spanish; (2) a survey and critique of effective teaching techniques; (3) bicultural and bilingual problems peculiar to this area. Taught in Spanish. Same as Linguistics 3400. Spanish 3400 and 3401 may not both be counted. *Prerequisite:* 6 hours of advanced Spanish, preferably including Spanish 3309.
- 3401 Methods of Foreign Language Instruction (3-0)**
Practical application of linguistic principles to the teaching of modern foreign languages. Classroom techniques, development and evaluation of teaching and testing materials appropriate to the written and spoken languages. May not be counted for credit in addition to French 3401, German 3401 or Linguistics 3401. Spanish 3401 and 3400 may not both be counted. *Prerequisite:* 6 hours of advanced courses in Spanish.
- 3414 Literary Theory and Analysis (3-0)**
Literary genres, criticism, esthetics, metrics, rhetoric, oriented toward the Hispanic literary tradition. Recommended for students considering future graduate study in the Hispanic literatures. *Prerequisite:* Spanish 3202.
- 3424 The Literary History of Mexico (3-0)**
Main literary trends and principal writers in Mexican literature. *Prerequisite:* 6 hours of advanced Spanish, preferably including Spanish 3302.
- 3425 The Novel of the Mexican Revolution (3-0)**
The principal novelists of the Mexican Revolution: López y Fuentes, Azuela, Guzmán, etc. *Prerequisite:* 6 hours of advanced Spanish, preferably including Spanish 3302.

- 3428 Golden Age Drama (3-0)**
A study of the leading dramatists: Lope de Vega, Tirso de Molina, Calderón de la Barca, Ruiz de Alarcón, Moreto and others. *Prerequisite:* 6 hours of advanced Spanish, preferably including Spanish 3301.
- 3432 Classical Spanish Prose (3-0)**
A study of the Spanish picaresque, chivalresque and pastoral novels and shorter forms. Some consideration of mystic and satirical masterpieces. Outside reading reports. *Prerequisite:* Six hours of advanced Spanish, preferably including Spanish 3301.
- 3433 Masterpieces of Spanish Literature (3-0)**
Selected works, studied in depth, including the *Poema de Mio Cid*, *Libro de Buen Humor*, *La Celestina*, etc. *Prerequisite:* 6 hours of advanced Spanish, including 3301.
- 3435 Nineteenth Century Spanish Novel (3-0)**
Readings from such authors as: Fernán Caballero, Valera, Alarcón, Pereda, Pérez Galdós, Pardo Bazán, etc. *Prerequisite:* 6 hours of advanced Spanish, preferably including Spanish 3303.
- 3439 The Short Story (3-0)**
Shorter fictional forms in Spain and Spanish America from Juan Manuel to the present. *Prerequisite:* 6 hours of advanced Spanish.
- 3441 Modern Spanish Drama (3-0)**
Prerequisite: 6 hours of advanced Spanish.
- 3448 Spanish Play Production**
Intensive analysis of outstanding plays from Spain or Spanish America, with emphasis on literary values and on problems of staging; public performance of at least one play at the end of the semester. *Prerequisite:* Six hours of advanced Spanish and consent of the instructor.
- 3451 Latin American Philosophy**
Selected works of Latin American thinkers (Rodó, Vasconcelos, Sarmiento, Vaz Ferreira, Octavio Paz, and others) are read and discussed both as contributions to literature and as milestones in the formation of modern Latin American thought. Team-taught by the Departments of Modern Languages and Philosophy. May not be counted for credit in addition to Philosophy 3451. *Prerequisite:* Six hours of advanced Spanish.
- 3456 The Generation of 1898 (3-0)**
Prerequisite: 6 hours of advanced Spanish.
- 3457 Syntax and Stylistics (3-0)**
Syntactical and stylistic analysis of contemporary texts in Spanish; translation of idiomatic English; free composition and creative writing. *Prerequisite:* 6 hours of advanced Spanish including Spanish 3357.
- 3458 Translation**
Techniques of translation of English into Spanish and vice-versa, including instantaneous oral, literary, business, and other forms of translation. *Prerequisite:* Six hours of advanced Spanish including 3357.
- 3459 Twentieth Century Spanish Literature (3-0)**
Prerequisite: 6 hours of advanced Spanish.
- 3460 The Regional and Historical Novel of Latin America (3-0)**
Study of novels representing the major geographical regions of Latin America, with their characteristic patterns of culture and speech. *Prerequisite:* 6 hours of advanced Spanish, preferably including Spanish 3302.
- 3461 Don Quixote (3-0)**
The literary value and influence of the *Quijote*. Traditional and modern interpretations. The life and times of Cervantes. Collateral readings and reports. *Prerequisite:* Six hours of advanced Spanish, preferably including Spanish 3301.
- 3462 The New World in Spanish Literature (3-0)**
Literary study of diaries, accounts and biographies of Spanish explorers in the New World, with special attention to the American Southwest. *Prerequisite:* 6 hours of advanced Spanish.

- 3463 The Literary History of Argentina (3-0)**
The principal movements and writers in Argentine literature. *Prerequisite:* 6 hours of advanced Spanish, preferably including Spanish 3302.
- 3464 Latin American Poetry (3-0)**
Prerequisite: 6 hours of advanced Spanish, preferably including Spanish 3302.
- 3465 The Contemporary Urban Novel of Latin America (3-0)**
A survey of the increasing tendency among Latin American novelists to portray life in rapidly growing population centers. *Prerequisite:* 6 hours of advanced Spanish.
- 3467 El ensayo hispanico (3-0)**
A study of the Spanish and Spanish American essay of the nineteenth and twentieth centuries: Larra, Ganivet, Rodó, Bello, Sarmiento, Martí, Sierra, Caso, Reyes and others. Conducted in Spanish. *Prerequisite:* Six hours of advanced Spanish.
- 3472 Contrastive Linguistics, English-Spanish (3-0)**
A contrastive study of the phonological, morphological, and syntactical systems of Spanish and English. Same as Linguistics 3472. *Prerequisite:* 6 hours of advanced Spanish, preferably including Spanish 3309.
- 3477 History of Spanish Poetry (3-0)**
A survey of Spanish poetry to the Twentieth Century. *Prerequisite:* 6 hours of advanced Spanish.
- 3490 Senior Seminar (3-0)**
May be repeated when topics vary. *Prerequisite:* 6 hours of advanced Spanish.
- 3494 History of the Spanish Language**
A survey of the phonological, morphological and syntactical changes from Vulgar Latin to modern Spanish. Same as Linguistics 3494. *Prerequisite:* Six hours of advanced Spanish, preferably including 3309 or 3357.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve hours of advanced courses in Spanish and a Bachelor's degree.

- 3590 Seminar (3-0)**
Spanish and Spanish-American literary or linguistic problems to be announced by the instructor at the beginning of each semester. May be repeated for credit.
- 3591 Graduate Reading Course: Seminar (3-0)**
May be repeated for credit.
- 3592 Seminar on the History of the Spanish Language (Phonology) (3-0)**
- 3593 Seminar on the History of the Spanish Language (Morphology) (3-0)**
- 3594 Cervantine Studies: Seminar (3-0)**
- 3595 Seminar on the Latin American Novel (3-0)**
- 3596 Seminar in Linguistics (3-0)**
- 3598-99 Thesis Course for the Master's Degree (3-0)**
Confer with the head of the department immediately upon registration.

MUSIC

E. A. THORMODSGAARD, *Chairman*
Professors EIDBO, THORMODSGAARD;
Associate Professor CARDON;
Assistant Professors FOUNTAIN, GIBSON, INSELMANN,
 LEWIS, PAUL, STANLEY, SWINGLE;
Instructors CROWLEY, EVERS, GEYER, KRESS, MUTNICK;
Part-Time Instructors GAIDRY, HEUSER, STRIBLING.

THEORY For Undergraduates

- 2111, 2112 Music Fundamentals (2-1)**
 Functional experiences in the basic fundamentals of music with simple melodic, harmonic and rhythmic activities; one through four-part singing and dictation. Open to all.
- 1111, 1112 Sight-Singing and Dictation (1-1)**
 Experience in aural recognition of tone relations through sight-singing, dictation, and keyboard activities. Concurrent registration with 3113, 3114 required. *Prerequisite:* Music 2112, or equivalent background.
- 3112, 3114 Essentials of Acoustics and Music Theory (3-0)**
 The combination, transmission and effects of musical sounds, utilizing symbols. The logic of order in music as exemplified in acoustics, overtone series, scales, diatonic harmony, rhythm, melody writing, non-harmonic devices, simple modulation. Concurrent registration with 1111, 1112 required. *Prerequisite:* 2112, or equivalent background.
- 1211, 1212 Sight Singing and Dictation (1-1)**
 Continuation of Music Theory 1112: Concurrent registration with 3213-14 required.
- 3213, 3214 Harmony (3-0)**
 Continuation of melodic and harmonic dictation and part writing; harmonic analysis and simple forms; seventh chords; altered chords; keyboard practice. *Prerequisite:* Music 3113-14. Concurrent registration with 1211-12 required.

For Undergraduates and Graduates

- 2311, 2312 Counterpoint (Seminar) (2-0)**
 Continuation of melodic and harmonic dictation; mixed chords, foreign modulation. Survey of sixteenth and eighteenth century contrapuntal techniques as exemplified in Palestrina and Bach. Introduction to Composition. *Prerequisite:* Music 3213-14.
- 2313, 2314 Seminar: Composition (2-0)**
 Modern styles of composition, including techniques from the Schillinger System, are integrated with traditional theory and composition in a practical course covering the smaller forms in vocal and instrumental music. *Prerequisite:* Theory 3213-14 or equivalent.
- 2315, 2316 Form and Analysis (2316 Seminar) (2-0)**
 Detailed study of the logic of musical structure as exemplified in representative works beginning with song forms and including the larger forms. *Prerequisite:* Music 3213-14.
- 3411 Choral Arranging (3-0)**
 A study of basic principles of writing, arranging, and editing choral music in two to eight parts. Emphasis upon music suitable for public school choral groups. *Prerequisite:* Music 3213-14.

3412 Instrumentation and Orchestration (3-0)

A study of orchestral and band instruments by classification. The range capabilities and limitations, timbre, transposition, etc. Practical experience in scoring for various combinations of instruments from trios to full orchestra and band. *Prerequisite:* Music 3213-14 and four semester hours, or equivalent, of class instruments.

2413, 2414 Seminar: Advanced Composition (Indiv.)

A continuation of Music 2313-14 with emphasis upon modern music and larger forms. *Prerequisite:* Music 2313-14.

2415 Seminar in Music Theory (Indiv.)

A study of melodic, harmonic and rhythmic devices and aspects of style including form, texture and tonality; practical experience in abstracting and applying theoretical principles. *Prerequisite:* Music 2315, and permission of Head of Department.

LITERATURE AND HISTORY

For Undergraduates

1141 Band Literature* (1-1)

A study of selected works in the field of band literature. Concurrent registration with band is required. *Prerequisite:* Placement.

1151 Choral Literature* (1-1)

A study of selected works in the field of choral literature. Concurrent registration with choir or chorus is required. *Prerequisite:* Placement.

1161 Orchestra Literature* (1-1)

A study of selected works in the field of orchestra literature. Concurrent registration with orchestra is required. *Prerequisite:* Placement.

1165 Chamber Music and Accompanying* (1-1)

Reading of music and the study of selected works characteristic to the performing group. *Prerequisite:* Placement.

3121 Introduction to Musical Literature (3-0)

A course for Music Majors. A brief survey of musical literature from the beginning of music through Modern Music, hearing recordings of representative works of each period, with major emphasis on the development of music up to the Classical Period.

3122 Trends in Musical Literature (3-0)

A survey, through directed listening, of the trends found in the great musical literature of the world, from the beginning of music through Modern Music; major emphasis on understanding the literature and styles of the Classical through Modern Periods. For Music Majors.

3124 Our Fascinating World of Music (3-0)

A course for all students, except music majors, who wish to derive understanding and enjoyment from musical experiences. Guided listening to live and recorded music typical of significant periods from antiquity through the present. Familiarization with listener's terminology. Development of background for selection of personal libraries. Group introductory experiences with social instruments and folk songs. Three hours per week.

3125 Our Music Heritage (3-0)

Continuation of 3124. More detailed and expanded study of the basic elements, forms (symphonic, etc.) and major style periods for increased understanding and listening pleasure. Relationship of a nation's music to its daily life, activities, ideals and conditions. Experimental comparison of the music of major ethnic groups. Emphasis on the style periods from the Baroque era through the 20th Century. Continued group participation and experiences with social instruments and folk songs. Three hours per week. *Prerequisite:* Music Literature 3124.

3126 The Music of Mexico (3-0)

A survey of Mexican music from Pre-conquest times to the present, including the development of Nationalism in music. Representative literature will be demonstrated by performances of guest artists and recordings. Open to all students.

*May be repeated for credit.

For Undergraduates and Graduates

- 2343-44 History of Ballet (2-0)**
The evolution of Ballet, choreographic styles and traditions, significant artists and their contributions, and contemporary ballet. *Prerequisite:* Ballet 3242.
- 3321 Music History (3-0)**
Chronological survey of the composers and their works through directed listening beginning with Greek Music and continuing through the Baroque period, with emphasis on the growth of our culture. *Prerequisite:* For music majors, Theory 3214 and junior standing; for others, six hours of music and junior standing.
- 3322 Music History (3-0)**
Continuation of Music History 3321, beginning with the Classic Period and continuing through contemporary music. *Prerequisite:* For music majors, Theory 3214 and junior standing; for others, six hours of music and junior standing.

MUSIC EDUCATION For Undergraduates

- 1201 Guided Observation, Professional Laboratory Experiences* (1-1)**
Observation of musical performances by individuals, groups, and organized classes of all age levels. This course is designed to enable students on the Sophomore and Junior levels to encounter professional problems and solutions.
- 2131 Church Music Leadership (2-1)**
Basic functions and techniques of conducting and accompanying. Recruiting for volunteer choirs. Selected problems in church choirs. Selection and preparation of suitable materials. Techniques for the conductor-accompanist.
- 3136 Church Music Materials, Organization and Direction (3-0)**
Basic administration and direction of a church music program; pastor and music director relationships; worship and training materials for all choirs; functions of lay groups; budgeting; choice and use of equipment. *Prerequisite:* Permission of the Head of the department.
- 3232 Age Group Choirs and Church School Music (3-0)**
Purposes and functions of age group choirs; care of child voices and changing voices; suitable materials; worship training; rote songs and reading. Integrating music with graded church school lessons; parent cooperation. *Prerequisite:* Music Education 3136 or equivalent experience and permission of the Head of the department.
- 3233 Hymnology and Liturgics (3-0)**
History, interpretation and use of hymns and hymn tunes, plainsong, spirituals, and carols. Twentieth century trends in hymnology. Uses of introits, responses, chants, and other similar forms in liturgical and non-liturgical services. *Prerequisite:* Music Education 3136 or equivalent experience and permission of Head of the department.

For Undergraduates and Graduates

- 3331 Choral Procedures, Techniques and Conducting in Elementary Schools (3-0)**
A study of unique problems in choir organization including the selection of voices. Special attention is given to the musical needs of the Elementary Grades, including rehearsal techniques phonetics, literature, interpretation, and baton techniques. *Prerequisite:* For music majors, 20 hours in music and Junior standing; for others, Music Theory 3114 and Junior standing.
- 3333 Techniques, Materials and Conducting in Secondary Schools (3-0)**
Selected problems in conducting, including instrumental experiences. Methods of developing good posture, baton techniques; fundamental principles in obtaining balance, color, shading, interpretation, score reading, etc. Program building and practical application of the conducting of smaller concert numbers. *Prerequisite:* For music majors, 20 hours in music and junior standing; for others, Music Theory 3114 and Junior standing.

*May be repeated for credit.

- 3334 Teaching of Music in the Elementary Schools (3-0)**
Consideration of music in relation to the child voice and song repertory, rhythm bands, dramatic play, discriminating listening, as determined by the child's stage of growth, correlation and integration with the elementary curriculum. Curricular plans and materials. For Elementary Education Majors. *Prerequisite:* Junior standing in Education.
- 3335 Teaching of Music in the Elementary Schools (3-0)**
Continuation of Music Education 3334, with emphasis on activities suitable for the classroom teacher. For Elementary Education Majors. *Prerequisite:* Music Education 3334, or equivalent musical training.
- 3336 Teaching of Music in the Elementary Schools (3-0)**
Pre-adolescent growth and development as the basis of procedures in the teaching of music in the Elementary grades. Designed to meet the needs of the special music teacher. The child voice, its development and classification. Introduction of notation, song materials, rhythm bands, appreciation methods and creative music for children. For Elementary School Music Majors. *Prerequisite:* Junior standing in music education, and Theory 3214.
- 3337 History of Church Music in America**
Worship music in the Colonies; European influences; development of American sacred music, changing worship concepts and procedures, The Great Revival, Denominational growth and musical activities. Modern trends. *Prerequisite:* Jun.or standing and approval of instructor.
- 3433 Teaching of Music in the Junior and Senior High Schools (3-0)**
The study of the adolescent growth and development, and related procedures in the teaching of music in the upper level grades and in high school. Choral and instrumental music materials, organization of ensembles, teaching of music appreciation and theory; correlation and integration with the entire school curriculum; public school type music as it is related to the life and needs of a community. *Prerequisite:* Junior standing in music education, and Theory 3214.
- 3435 Seminar: Selected Problems in Music Education (Indiv.)**
The student may receive individual instruction and guidance in the area in which a specific need is demonstrated. Credit may be received in the elementary or secondary school field. *Prerequisite:* Six hours of Education, six hours of Music, senior standing, or equivalent background as determined by the instructor and Head of the department.
- 3436 Church Music Materials, Organization and Direction (3-0)**
Continuation of 3136. Required of students planning to be "Ministers of Music." *Prerequisite:* Music Education 3136, or equivalent training and experience, and senior standing. Offered Summer Sessions only.
- 3444 Choreography (3-0)**
Principles of development, rehearsal, and execution of ballet choreography. *Prerequisite:* Ballet 3342.
- 3496 Professional Laboratory Experience in the Elementary Grades (1-10)**
A minimum of ten hours per week for one semester of laboratory observation and teaching experience in the elementary school music classes. For all-level teacher certification. *Prerequisite:* Six hours of Education, six hours of upper level Music Education, senior standing and written approval of Music Faculty Teacher Education Committee.
- 3498 Professional Laboratory Experience in Junior and Senior High Schools (1-10)**
Continuation of 3496. *Prerequisite:* Music Education 3496, or concurrent registration with written approval of the Music Faculty Teacher Education Committee.

*May be repeated for credit.

FOR GRADUATE STUDENTS ONLY

- 3531 Seminar: Problems in Music Education (Indiv.)***
Educational research in the elementary and secondary school fields. Each student may conduct research on a problem of his own selection in his field of major interest. May be taken for credit in supervision, if desired. *Prerequisite:* Twelve semester hours of advanced courses in Music and a bachelor's degree. May be repeated for credit.
- 3535 Seminar: Field Work in Music Education (Indiv.)***
The student works individually on a selected topic with an assigned specialist in that area under supervision of department head. *Prerequisite:* Twelve semester hours of advanced courses in Music and a bachelor's degree. May be repeated for credit.

APPLIED MUSIC

For Undergraduates

ENSEMBLES

Symphonic Wind Ensemble, Symphonic Band, Marching Band, Lab Stage Band, Ballet Corps, Chorale, Chorus, Orchestra, Guitar, and small chamber groups are maintained. These organizations are open to all students who wish to enjoy the performance of a great variety of music. On special occasions each year, several organizations are combined in large productions including operas, ballets, and oratorios. Home concerts and concert tours are a part of the program. Consent of instructor is required for admission.

- 1143 Band* (3-0)**
Prerequisite: Permission of instructor.
- 1144 Orchestra* (3-0)**
Prerequisite: Permission of instructor.
- 1145 University Chorale (Choir)* (3-0)**
Prerequisite: Permission of instructor.
- 1146 Lab Band (Varsitonians)* (3-0)**
Prerequisite: Permission of instructor.
- 1147 Ballet Ensemble* (3-0)**
Performing techniques and participation in the University Ballet Corps. Ballet majors are required to participate for eight semesters and/or each semester in attendance. Open to all through audition and permission of instructor.
- 1148 Guitar Ensemble* (3-0)**
Prerequisite: Permission of instructor.
- 1155 University Chorus* (2-0)**
A mixed singing organization open to all students interested in any kind of choral work. Audition is not required. Oratorios and operas are presented with orchestral accompaniment, occasionally in combination with the University Chorale. Open to all.
- 1102 Golddiggers* (1-4)**
A course for women in dancing, twirling, pom pom and marching activities; participation in football shows and other public appearances. *Prerequisite:* Admission by try-out only.

GROUP INSTRUCTION

Credit granted only when taken as a secondary instrument or elective. Open to all students with permission of instructor.

- 2171 Piano Class (1st Semester) (2-1)**
- 2172 Piano Class (2nd Semester) (2-1)**

*May be repeated for credit.

School of Liberal Arts

- 2271 Piano Class (3rd Semester) (2-1)**
2272 Piano Class (4th Semester) (2-1)
1173, 1174 Piano Sight-Reading Class (1-1) [Formerly 2373, 2374]
Emphasis on actual playing experience and sight-reading at the piano. *Prerequisite:* Permission of instructor.
2173 Voice Class (1st Semester) (2-1)
2174 Voice Class (2nd Semester) (2-1)
1175 Guitar for Classroom Teachers (1-1)
Techniques and materials for the use of guitar as an aid in the public school classroom at all levels. Chording and accompaniment for vocal and instrumental solos and ensembles. Prerequisite: Permission of instructor.
2175 Low Strings Pedagogy (2-1)
2176 High Strings Pedagogy (2-1)
2177 Woodwinds Pedagogy (Reeds) (2-1)
2178 Brass Pedagogy (2-1)
2179 Percussion Pedagogy (2-1)
3190 Foreign Language Diction (3-0)
A survey course in Italian, German and French pronunciation; free translation. Open to all.
2223, 2224 Opera Workshop (2-1)
Study and participation in all phases of opera production, dramatic interpretation, preparation of scenes and directing of small-scale productions. Survey of practical opera literature for community and public school performances. *Prerequisite:* Sophomore standing, permission of the instructor, and preceding course where listed.

For Undergraduates and Graduates

- 2323, 2324 Opera Workshop (2-1)**
Continuation of 2224. *Prerequisite:* Junior standing, permission of the instructor, and preceding course where listed.
2493 Pedagogy of Voice (2-1)
Psychological and physiological problems in voice-building; study of the boy voice, the "monotone," and registers in all voice classifications. Methods of voice development through song literature. *Prerequisite:* Senior standing in music, or equivalent in vocal study and experience, Voice 2292, and permission of instructor.
2494 Piano Pedagogy and Literature (2-1)
Psychology and art of teaching piano in group piano classes and/or in private lessons. Study and analysis of piano literature appropriate for all graded levels. *Prerequisite:* Piano 2392 and permission of instructor.

BALLET

For Undergraduates

- 2141-42 Ballet Technique (3-0)**
Basic ballet techniques combining the methods of the Russian, Cecchetti and French Schools. Section I open to all students as an elective, not including majors.
3141-42 Ballet Technique (4½-0)
Same as above, but open only to students majoring in ballet, with the consent of instructor.
1241, 1242 Character and Jazz Dance* (2-0)
Interpretation of national dancing; fundamentals and techniques of Jazz. Two hours per week. *Prerequisite:* Ballet, modern dance, or athletic (football, basketball, etc.) background, and permission of instructor.
3241, 3242 Intermediate Ballet (4½-0)
Continuation of 3142, with more advanced work in the creative aspects of dance movements. Four and one-half hours per week. *Prerequisite:* Ballet 3142 or permission of instructor. (Formerly 2241, 2242.)

* May be repeated for credit.

3341, 3342 Ballet Techniques (4½-0)

Continuation of 3242; advanced techniques with increased emphasis on certain creative aspects of dance movements. *Prerequisite:* Ballet 3242, or equivalent, junior standing, and permission of the instructor.

3441-42 Advanced Ballet Techniques (4½-0)

For students wishing to study ballet as a principal performance medium. Concentrated study including points and adagio work. Admission is by audition only. *Prerequisite:* Ballet 3342.

INDIVIDUAL INSTRUCTION

Placement auditions are required on the major and secondary instruments. Students who demonstrate adequate proficiency on any required instrument (or voice) will be encouraged to substitute other courses outside of the music area. Students will perform before the Music Faculty at the close of each semester. The audition at the close of the second year also determines admission to upper division courses. A grade of "B" is required on the major instrument for permission to continue with the succeeding course. For full description of the course of study for any Applied Music course, consult the Music Department Handbook with the Department Chairman.

Consent of the instructor is required for all individual instruction.

Junior and senior courses on the major level may be used for undergraduate and graduate credit and may be repeated for credit on the undergraduate level. Students are expected to study on campus with members of the University music faculty. Performance majors must present a full graduation recital approved by the music faculty. Music Education majors must present a partial recital.

For Undergraduates and Graduates

Only *junior* and *senior* courses with "9" as the third digit are acceptable towards a graduate degree.

For Voice, Keyboard Instruments (Piano, Organ, Harpsichord, Accordion), Orchestra and Band Instruments (Violin, Viola, Violoncello, String Bass, Flute, Oboe, Clarinet, Bassoon, Saxophone, Cornet or Trumpet, French Horn, Trombone, Baritone, Tuba, Percussion, Harp, Guitar).

FOR NON-MAJORS, AS A SECONDARY INSTRUMENT, and for students needing preparatory study. Undergraduate credit only.

2181, 82, 2281, 82, 2381, 82, (\$25)

One thirty-minute lesson and six practice hours per week. *Prerequisite:* Preceding course or placement.

3181, 82, 3281, 82 (\$45)

Two thirty-minute lessons and nine practice hours per week. *Prerequisite:* Preceding course or placement.

3381, 82, 3481, 82 (\$50)

Two thirty-minute lessons and nine practice hours per week. *Prerequisite:* Preceding course or placement.

FOR MAJORS in Voice, Theory, Music Education, and other qualified students.

2191, 92, 2291, 92, 2391, 92, 2491, 92 (\$25)

One thirty-minute lesson and six practice hours per week. *Prerequisite:* Preceding course or placement.

3191, 92, 3291, 92 (\$45)

Two thirty-minute lessons and nine practice hours per week. *Prerequisite:* Preceding course or placement.

3391, 92, 3491, 92 (\$50)

Two thirty-minute lessons and nine practice hours per week. Recital participation. *Prerequisite:* Preceding course or placement.

School of Liberal Arts

FOR MAJORS IN PERFORMANCE

4191, 92, 4291, 92 (\$45)

Two thirty-minute lessons and fifteen practice hours per week. Recital participation. *Prerequisite:* Preceding course or placement.

4391, 92, 4491, 92 (\$50)

Two thirty-minute lessons and fifteen practice hours per week. Recital participation. *Prerequisite:* Preceding course or placement.

PHILOSOPHY

WILLIAM C. SPRINGER, *Chairman*
H. Y. Benedict Professor ROMANELL;
Professor HADDOX; *Associate Professors* HALL, SPRINGER;
Assistant Professors FERRO GAY, ROBINSON.
Instructor BRIONES.

B.A. Degree — Specific courses required for the Bachelor of Arts in Philosophy are Philosophy 3203, 3205, 3214, 3215, and 3451 or 3452.

(Philosophy 3203 is the prerequisite for all courses in philosophy except Phil. 3104.)

- 3104 Logic (3-0)**
A study of deductive reasoning.
- 3109 Chicanos and American Thought**
This course takes the given socio-cultural and political phenomenon of Chicano-ismo and subjects it to a critical analysis, examining some of the underlying premises and attempting to project possibilities. The focus is on group identity and alienation, myth and *Raza*, traditional legacy and new values, *Machismo* and stereotypes, language and world.
- 3203 Introduction to Philosophy (3-0)**
An introduction to the basic problems of philosophy, with readings from primary sources.
- 3205 Modern Philosophy (3-0)**
Philosophic thought from Descartes through 19th Century idealism.
- 3206 Ethics (3-0)**
A discussion of moral principles.
- 3208 Aesthetics (3-0)**
An analysis of the various theories of beauty.
- 3212 Latin American Philosophy (3-0)**
A survey of Latin American thought.
- 3213 Chicanos and American Thought**
After an analysis of the intellectual heritage (Pre-Hispanic, Spanish, and Mexican) of the present-day Chicano, contemporary Chicano value orientations are compared and contrasted with such orientations in American society.
- 3214 Ancient Philosophy**
The study of the thought of selected philosophers from early Greek to late Roman times.
- 3215 Medieval Philosophy**
A study of the thought of selected philosophers from Augustine to Ockham.
- 3216 Social Philosophy**
This course will consider such concepts as law, freedom, authority, justice, violence, revolution, etc., in their relevance to an understanding of extant forms of social existence public and private.
- General Prerequisite:* Junior standing for all 3300 or 3400 level courses.
- 3311 Philosophy of Science (3-0)**
A study of the methods and implications of the mathematical and natural sciences.
- 3322 Philosophy of Religion (3-0)**
A philosophical analysis of the various aspects of religion.
- 3331 Ethical Theory (3-0)**
An analysis of the various approaches to the significance of moral belief.

- 3333 Contemporary Analytic Philosophy**
This course will examine original writings of some of the analytic philosophers such as Moore, Wittgenstein, Wisdom, Austin, Ryle. *Prerequisites* 3214 or 3215.
- 3334 Contemporary Phenomenology and Existentialism**
This course will examine such authors as Kierkegaard, Heidegger, Sartre, Marcel, Merleau-Ponty. *Prerequisite:* 3214 or 3215.
- 3401 Symbolic Logic (3-0)**
A study of contemporary mathematical logic.
- 3402 Metaphysics (3-0)**
A comparative analysis of the basic theories of reality.
- 3403 Problems in the Philosophy of Science (3-0)**
A detailed analysis of a small number of selected problems in the Philosophy of Science.
- 3411 Epistemology (3-0)**
A study of the ways of knowing and the nature of truth.
- 3451 Great Philosophers**
The life and work of one or more of the most influential philosophers will be the subject of study. May be repeated when the course content varies. *Prerequisite:* Philosophy 3214 and 3215 or equivalent.
- 3452 Problems of Philosophy — Seminar (3-0)**
May be repeated when the course content varies. *Prerequisite:* As determined by the instructor.
- 3453 Independent Study**
Independent student work under the supervision of the staff. Permission of the instructor required.
- 3454 Philosophy of History**
An examination of attempts to find recurring patterns and laws in the course of history, and/or an examination of historical narrative to compare and contrast historical with scientific explanation. *Prerequisite:* Philosophy 3311 or 3441 or equivalent.

RELIGION

MSGR. ANDREW BURKE, *Chairman*

Instructors ALLEN, ATKINSON, BURKE, FENNER, HUDGENS and HUTTON;

Credit toward University degrees is given for the following courses offered under the regulations established by the Board of Regents:

The students enrolled in the courses for credit (1) may be credited with no more than twelve semester hours in Religion on any Bachelor's degree; (2) are subject to the regulations of the catalog on the amount of work which may be carried.

For Undergraduate Credit Only

Suggested prerequisite: Junior standing for all 3300 or 3400 level courses.

- 1101 Introduction to the Bible**
A course to provide the beginning Bible student with a general introduction to the Bible. Those who have had 3101 or 3104 may not take this course.

- 2101 The Biblical Teachings on Marriage and the Home (1-0)**
A study of Biblical teachings on the home and marriage with an effort to apply the principles to today's problems.
- 3101 Survey of the Old Testament (3-0)**
A comprehensive study of the entire Old Testament.
- 3104 Survey of the New Testament (3-0)**
A comprehensive study of the entire New Testament.
- 3202 The Life of Christ (3-0)**
A historical study of the life and teachings of Christ. *Prerequisite:* Religion 3104 or Sophomore standing.
- 2202 Poetical and Wisdom Literature of the Old Testament (1-0)**
A study of the Hebrew contributions to poetry. Special attention will be given to background, style and content of the Old Testament books which are classified as poetry: Job, Psalms, Proverbs, Ecclesiastes, Song of Solomon, and Lamentations. *Prerequisite:* Religion 3101.
- 3201 The Life of Paul (3-0)**
A historical study of the life and missionary endeavors of the Apostle Paul. *Prerequisite:* Religion 3104 or Sophomore standing.
- 3203 An Introduction to the Psychology of Religion (3-0)**
To introduce students to the creative dialogue between the disciplines of the psychological sciences and theological studies through the writings of psychiatry, psychoanalysis and religion. *Prerequisite:* Religion 3101 or 3104 or Sophomore standing.
- 3204 Survey of World Religions (3-0)**
An introduction to the study of religion and an examination of primitive religion. Among the living religions, Zoroastrianism, Hinduism, Buddhism, Confucianism, Taoism, Shintoism, Judaism, and Christianity will be studied. *Prerequisite:* Sophomore standing or Religion 3101 or 3104.
- 3205 The Hebrew Prophets (2-0)**
A study of the place of Hebrew prophecy in the development of the Old Testament. Special attention will be given to all of the major and minor prophets. *Prerequisite:* Religion 3101 or Sophomore standing.
- 3303 Archeology of the Old Testament (3-0)**
A study of archeology in Biblical lands as related to the Old Testament. *Prerequisite:* 3101 or 2202.
- 3304 Survey of Christian Tradition in America**
An historical study of varying Christian denominational traditions in the United States. This will be taught by a team of various professors experts in the distinctive traditions. *Prerequisite:* Junior level or permission of instructor.
- 3305 Introduction to Christian Ethics**
A study of New Testament ethical teaching and their application to contemporary society. *Prerequisite:* Religion 3202 or Junior standing.

POLITICAL SCIENCE

EDWARD A. LEONARD, *Chairman*

Professor Emeritus MYRES

Professors BEASLEY, COOK, GOMEZ, KRUSZEWSKI, RAY, STRAUS;

Associate Professors GRAVES, LEONARD, NEIGHBOR, PETERSON;

Assistant Professors BATH, DE LA GARZA, HOVEL, LAMARE, PRICE;

Instructor BETHUNE.

B.A. Degree — In addition to the basic American Government and Politics courses 3110 and 3111 required of all students, a major in Political Science will include thirty (30) semester hours in the Department, eighteen of which must be at the advanced (3300-3400) level. At least one course must be completed in each of the following fields:

American Political Processes
Public Law
International Relations
Comparative Politics
Political Theory and Thought
Public Administration

Scope and methods of Political Science (Political Science 3439) and Undergraduate Research in Political Science (Political Science 3480) are offered primarily for senior students who intend to pursue graduate study. The department head may require qualified majors to take one or both of these two courses as partial fulfillment of the total hour requirement for majors.

Soviet and East European Studies Option: Specific requirements for all students in the program: Russian 3321, 3323; Political Science 3324, 3338; History 3331 or 3333 and 3373 or 3374; Economics 3395; Geography 3207; English 3385 or 3386. The Political Science major must include 3231, 3426, 3224, 3250, 3335, 3343, plus 3 advanced hours in each of the following fields: American Politics and Public Law. Other departmental requirements are three of the following: History 3202, 3338, 3377; Sociology 3425, 3455.

For Undergraduates

Prerequisite: Political Science 3110 and 3111.

Political Science 3110 and Political Science 3111 fulfill the legislative requirements of the State of Texas for a course on the Constitutions of the United States and Texas.

3110 American Government and Politics (3-0)

A survey of the basic concepts used in the contemporary study of American national, state, and local political processes and institutions.

3111 American Government and Politics

A survey of contemporary American national, state, and local political processes and institutions, with special emphasis upon the Constitutions of the United States and Texas. This course meets teacher certification requirements for out-of-state graduate students. *Prerequisite:* For undergraduates is 3110.

3221 Comparative Federalism (3-0)

A comparative examination of federal political systems. Emphasis may be upon the political systems of the fifty American states, or upon those of foreign nations having federal institutions.

3224 Comparative Political Systems (3-0)

An examination of theories and methods used in comparative political analysis with illustrative cases drawn from a variety of political cultures.

3231 International Relations (3-0)

The theory and practice of international relations with particular attention to the forces and processes contributing to conflict and cooperation among nations.

3250 Introduction to Public Administration (3-0)

A study of the processes involved in the management of men and materials in the accomplishment of the purposes of government; analysis of the structure and procedures of the administrative or executive branch of government, with particular reference to national, state and local governments in the United States.

For Undergraduates and Graduates

General prerequisite: Junior standing for all 3300 or 3400 level courses.

AMERICAN POLITICAL PROCESSES**3320 Political Socialization and Political Culture (3-0)**

An analysis of the influence of cultural, psychological, and social patterns on the nature of political orientations and political systems. *Prerequisite:* Political Science 3224.

3321 Chicanos in American Politics (3-0)

Survey of the nature and role of the Chicano in the American Political System.

3322 Urban Politics (3-0)

The American Political Process in its urban environment.

3325 The Party System (3-0)

An analysis of the nature and role of American parties and pressure groups and their impacts upon the political process.

3327 The Legislative Process (3-0)

A study of the legislative system, organization, and procedures; analysis of recruitment patterns, and the nature of the relation of the legislature to the rest of the political system.

3330 Public Opinion and Propaganda (3-0)

A study of the nature and formation of public opinion, its measurement, and the impact of public opinion on policy formation.

3339 Intergovernmental Relations (3-0)

An examination of the developing relationships among units of government in the United States, with special emphasis on the emerging theory of intergovernmental relations.

3420 American Government and the Military (3-0)

An examination of civil-military relations in the United States; American military policy formation and administration; martial law; military government; state military forces; the doctrine of civil supremacy. Some comparisons will be made with civil-military relations abroad.

PUBLIC LAW**3328 Constitutional Law I (3-0)**

A study, by use of court cases, of the allocation of governmental powers, with special emphasis on the national government, and an introduction to the judicial function and the American legal system.

3332 Constitutional Law II (3-0)

A study of the limitations on governmental power in the United States, with primary emphasis on civil and political rights. *Prerequisite:* Political Science 3328.

3329 Law and Society (3-0)

An analysis of the role of law in society and the causes and consequences of judicial behavior.

3427 Administrative Law and Regulation (3-0)

The study of law as it affects public officials and agencies in their relations with private citizens and the business community. Attention is given to appropriate case materials and regulatory practices.

3429 Philosophy of Law (3-0)

A study of the origin, nature, and development of law. The philosophical explanation of law as propounded by the various jurisprudential schools. *Prerequisite:* Graduate standing or consent of the instructor.

INTERNATIONAL RELATIONS

- 3331 International Organization and Administration (3-0)**
The development of the machinery and procedure of international government for the peaceful settlement of international disputes.
- 3338 Soviet Foreign Policy (3-0)**
A study of the objectives, methods and results of Soviet foreign policy.
- 3343 Foreign Policy of the United States (3-0)**
Origin and development of fundamental principles of American foreign policy.
- 3347 Foreign Policies of the Latin American States (3-0)**
The role of the major Latin American states in world affairs with emphasis on Latin America-U.S. relations and political, economic, and socio-cultural relations between the Latin American states.
- 3431 Advanced Studies in International Relations (3-0)**
Theory application and theory verification in the analysis of selected problems in contemporary international relations.

COMPARATIVE POLITICS

- 3323 Great Britain and the Commonwealth (3-0)**
An examination of British political institutions, phenomena, and problems in the mother country and in selected parts of the Commonwealth.
- 3324 Soviet and Eastern European Politics (3-0)**
A survey of Contemporary Soviet and Eastern European Politics set in an ideological and historical framework. The role of the party in each country examined in the setting of labor, management, the army, agriculture and nationality problems.
- 3326 Western European Politics (3-0)**
A comparative analysis of the political systems of the major Western European powers and selected minor powers. Emphasis on political culture and the impact upon political institutions and functions.
- 3333 Problems in Latin American Government (3-0)**
A study of the nature and scope of problems in the political development of Latin American nations.
- 3342 Government and Politics of Non-Western Areas (3-0)**
The study of political cultures, interest groups, political parties, processes and structures of Non-Western areas. Specific areas to be studied will be selected by the instructor. Course may be repeated for credit with approval of the Head of the Department.
- 3426 Polycentrism in the Communist World (3-0)**
An analysis of ideological and pragmatic conflict in the context of centrifugal and centripetal forces within the Communist world today.
- 3444 The Political System of Mexico (3-0)**
An examination of political processes and institutions within the social, economic, and cultural environment of political development in Mexico.

POLITICAL THEORY AND THOUGHT

- 3334 Western Political Heritage (3-0)**
From Plato to Burke. A study of the ideas of the major political philosophers of the ancient, medieval, and early modern periods, including the Enlightenment.
- 3335 Western Political Heritage (3-0)**
From Kant to the Present, Political thought from the late eighteenth century to the present, with an emphasis on the development of contemporary ideologies.

- 3336 American Political Thought (3-0)**
From the Colonial Period to the Civil War. The ideas of the earlier American Political thinkers. Attention will be given to the conflicts over the American Revolution, the framing and adoption of the Constitution, Jacksonian democracy, and the abolition of slavery.
- 3337 American Political Thought (3-0)**
From the Civil War to the Present. A study of recent American political and legal thought. Attention will be given to shifting ideas about democracy, the role of government, and the nation's place in international affairs, as well as to the changing meanings of liberalism and conservatism.
- 3433 Latin American Political Thought (3-0)**
A study of representative thinkers who have influenced political development in Latin America.
- 3435 Contemporary Political Thought (3-0)**
The ideas of contemporary political thinkers concerning the great modern issues of democracy, dictatorship, industrial order, and the political needs of the developing peoples. Emphasis also will be placed upon the process of political theorizing.
- 3439 Scope and Methods of Political Science (3-0)**
A survey of the scope and methodology of political science. An analysis and criticism of research in the field with emphasis on methods and techniques. Required of majors planning graduate study.

PUBLIC ADMINISTRATION

- 3340 Public Policy Formulation (3-0)**
The dynamics of public policy formulation in the governments of the United States. Emphasis will be placed upon the national bureaucracy.
- 3341 The Presidency (3-0)**
Examination of the Office of the President in relation to the functions, roles, powers, and duties which have accrued to the office as it has developed in scope and authority from Washington to the present.
- 3351 Municipal Planning Administration (3-0)**
History, principles and theories of urban growth, planning, and development with emphasis on public policy, and the administrative and legislative processes.
- 3421 Urban Government and Administration (3-0)**
The organization and administration of urban government in the United States. *Prerequisite:* 12 hours of advanced social sciences.
- 3438 Administrative Theory (3-0)**
Emphasis is placed on administrative decision-making, leadership, supervision, communications and control in public and private organizations.
- 3450 Internship in Public Administration (3-0)**
This course is open only to seniors and graduate students with the approval of the Head of the Department. It is a work-study program in which the student is assigned two days (or 16-20 hours) each week to a governmental agency. A weekly seminar session is also required. Normally open only to students interested in professional preparation in public administration.

GENERAL

- 3410 Readings in Political Science (3-0)**
- 3480 Undergraduate Research in Political Science (3-0)**
A research and writing experience for undergraduates in political science. An intensive investigation into the foundations of political science with emphasis on research.

FOR GRADUATE STUDENTS ONLY

All SEMINARS may be repeated for credit.

(Prerequisite: Graduate Standing)

- 3500 Seminar in Public Fiscal and Personnel Administration**
A study of organization, practices, and principles of public fiscal and personnel administration.
- 3501 Seminar in Advanced Research Methods in Political Science (3-1)**
Required of all graduate political science majors. Normally, the seminar will be taken during the first semester of graduate study. One additional hour of credit will be given for training in computer programming.
- 3510 Seminar in American Government**
Research, writing, and discussion.
- 3520 Seminar in American Government and the Military**
Research, writing, and discussion.
- 3521 Seminar in the Methodology of Comparative Politics (3-0)**
Advanced paradigms, methods and theoretical applications in Comparative Politics.
- 3522 Seminar in the Politics of Modernizing Nations (3-0)**
Reading, writing, discussion. Prerequisite: Political Science 3521.
- 3523 Seminar in Communist Politics**
Research, writing, and discussion.
- 3524 Seminar in Comparative Political Cultures**
Research, writing, and discussion. Prerequisite: Political Science 3521.
- 3525 Seminar in Latin American Studies**
Research, writing, and discussion. Prerequisite: Political Science 3521.
- 3526 Seminar in Political Parties and Politics**
Research, writing, and discussion.
- 3528 Seminar in Public Law**
Research, writing, and discussion.
- 3530 Seminar in International Relations**
Research, writing, and discussion.
- 3536 Seminar in Political Theory**
Research, writing, and discussion.
- 3537 Seminar in Political Classics**
Research, writing, and discussion.
- 3550 Seminar in Public Administration**
Research, writing, and discussion.
- 3551 Seminar in Urban Problems**
Research, writing, and discussion.
- 3580 Selected Problems in Government**
Research, writing, and discussion.
- 3598-99 Thesis in Government**

CRIMINAL JUSTICE

The following criminal justice courses are being sponsored by the Department of Political Science; however, these courses are not to be taken as substitutes for political science courses.

- 3101 Introduction to Criminal Justice (3-0)**
Development and philosophy of criminal justice in a democratic society; introduction to agencies involved in the administration of criminal justice.
- 3200 Legal Aspects of Law Enforcement (3-0)**
History and philosophy of modern criminal law, including the structure, definition and application of statutes and leading case law; the elements of crimes and penalties; general provisions of the Penal Code.
- 3201 Criminal Investigation (3-0)**
Introduction to the fundamentals of criminal investigation, including theory and history, conduct at crime scenes, collection and preservation of evidence.
- 3205 Criminal Procedures and Evidence (3-0)**
Introduction to the rules governing the admissibility of evidence and types of evidence; criminal procedure in various courts; review of the Texas Code of Criminal Procedure, including laws of arrest, search and seizure, and leading case law in each topic.
- 3302 Police Organization and Administration (3-0)**
Principles of organization and management as applied to law enforcement agencies; introduction to concepts of organizational behavior.
- 3303 Police Role in Crime and Delinquency (3-0)**
Introduction to deviant behavior and current criminological theories with emphasis on synthesis and police applications: Crime prevention and the phenomena of crime.
- 3304 Police-Community Relations (3-0)**
The role of the individual officer in achieving and maintaining public support; human relations, public information; relationships with violators and complainants.
- 3305 Penology: The American Correctional System (3-0)**
Analysis and evaluation of contemporary correctional systems, discussion of recent research concerning the correctional institution and the various field sciences.
Prerequisite: Sociology 3348, Criminology or consent of instructor.
- 3306 Probation and Parole (3-0)**
Development, organization, operation and result of systems of probation and parole as substitutions for incarceration; methods of selection; prediction scales.
Prerequisite: Sociology 3348, Criminology or consent of instructor.

PSYCHOLOGY

JUDITH GOGGIN, *Chairman*

Professors COLEMAN, HIMELSTEIN;

Associate Professors BARRIENTOS, DEVINE, GOGGIN, MILLER, WHITWORTH;

Assistant Professors KOESTLER, LUCKER, TAMLER.

Degree Requirements:

The Psychology Department offers two programs leading to the Bachelor's Degree:

1. **B.S. Degree** for students who intend to pursue graduate work in psychology. Required courses are:
 - a) Major: 30 hours (15 advanced) including 3101, 3103, 3221, 3222, 3310, and 3417.
 - b) Minor: 18 hours (6 advanced) selected from Biological Sciences, Chemistry, Engineering, Mathematics, or Physics.
 - c) Mathematics 4111, 3212.
 - d) Foreign language while not required, is strongly recommended.

For additional requirements, see Bachelor of Science degree plan.

2. **B.A. Degree** for students who do NOT intend to get advanced degrees. Required courses are:
 - a) Major: 24 hours (12 advanced) including 3101, 3103, 3221 or 3222.
 - b) 12 hours selected from Biological Sciences, Chemistry, or Physics. Specific courses for the science requirement to be selected in conference with the Department.

For additional requirements, see Bachelor of Arts degree plan.

For Undergraduate Credit Only

General prerequisite: Psychology 3101 is prerequisite for all psychology courses, with the exception of Psychology 3103. Junior standing for all 3300 or 3400 level courses.

3101 Introduction to Psychology (3-0)

A survey of basic principles in general psychology. *Prerequisite:* University entrance.

3103 Statistical Methods (3-1)

A study of the basic concepts of descriptive and inferential statistics as applied to research in the behavioral sciences. Topics include descriptive statistics, experimental design, correlation, analysis of variance, and non-parametric tests. Required of all psychology majors.

3111 Advanced Introductory Psychology (2-2)

An in depth survey of basic principles in general Psychology. *Prerequisite:* Psychology 3101.

3201 Child Psychology (3-0)

Principles of growth and development from infancy to adolescence.

3202 Social Psychology (3-0)

The individual in society, dealing with human relations, group effectiveness, and conflicts among people. Principles of social behavior. Applied social psychology, cognition, motivation, attitudes, society, culture, groups, leadership.

3203 Social Psychology of the Chicano

An introduction to the problem of identity and self-image in the Mexican American segment of the population. Basic principles of psychology applied to the understanding of cognitive and social behavior.

3206 Psychology of Personality (3-0)

A study of the normal personality. Includes such topics as biological and social determinants of personality; appraisal of personality; and reactions to anxiety, frustration, and conflict.

- 3210 Developmental Psychology (3-0)**
A study of the behavior and special problems characteristic in the development of the individual.
- 3212 Introduction to Abnormal Psychology (3-0)**
A review of historical approaches to the problems of abnormal behavior. Topics will include the dynamics of abnormal behavior, its classification, symptomatology, and treatment.
- 3221 Experimental Psychology: Learning (3-2)**
An introduction to method and theory in contemporary experimental psychology. Emphasis is on method rather than on content. Topics emphasize the phenomena of learning. *Prerequisite:* Psychology 3103.
- 3222 Experimental Psychology: Sensation and Perception (3-2)**
An introduction to method and theory in contemporary experimental psychology. Emphasis is on method rather than on content. Topics emphasize the phenomena of sensation and perception. *Prerequisite:* Psychology 3103.
- 3224 Applied Psychology (3-0)**
An introduction to the application of psychological principles and procedures to business and industry, consumer psychology, mental health and vocational guidance, and criminal behavior.
- 3302 Theories of Personality (3-0)**
A study of major systematic positions, i.e., Freud, Lewin, Cattell, etc. Major emphasis is put on the various theoretical interpretations of human dynamics.
- 3304 Differential Psychology (3-0)**
A survey of the psychological principles and methods of investigating individual and group differences.
- 3306 Psychology of the Exceptional Child (3-0)**
Application of psychological principles to the study of the atypical child, including a survey of etiological theories. *Prerequisite:* Psychology 3103.
- 3309 History and Systems of Psychology (3-0)**
A study of the historical development of psychological views.
- 3310 Introduction to Learning Theory (3-0)**
Introduction to the nature of the learning process and the application of learning principles.
- 3330 Perception (3-0)**
A study of the major theoretical changes and experimental findings concerning perception and sensory processes. Emphasis on vision and audition. *Prerequisite:* Psychology 3221 or 3222.
- 3347 Behavior Modification (3-0)**
A review of contemporary studies involving the application of classical and operant conditioning techniques in the treatment of behavior disorders. Emphasis will be given to clinical cases. *Prerequisite:* Psychology 3310.
- 3348 Psychology of Thinking (3-0)**
An analysis of thought which will include principles and research approaches to information processing, concept formation, decision processes (judgment) solution and creative accomplishment. *Prerequisite:* Psychology 3221 recommended.

For Undergraduates and Graduates

General prerequisite: Six advanced hours in psychology.

- 3401 Psychological Testing (2-2)**
Introduction to and training in the administration, scoring, and interpretation of psychological tests. *Prerequisite:* Psychology 3103; Psychology 3417 recommended.
- 3410 Clinical Psychology (3-0)**
A study of clinical problems, case study methods and discussion of psychological tests used in common clinical situations.

- 3411 Physiological Psychology (3-0)**
Basic psychological processes in relation to structure and function.
- 3412 Advanced Abnormal Psychology (3-0)**
A study of the psychological factors contributing to pathological behavior. Emphasis will be placed on current research in genetics, biochemistry, and learning theory, in the area of schizophrenia and neurotic processes. *Prerequisite:* Psychology 3212.
- 3417 Advanced Statistics (3-0)**
Further study of experimental design, analysis of variance, covariance, correlation, orthogonal polynomials, complex experimental designs, and non-parametric statistics. *Prerequisite:* Psychology 3103; Mathematics 4110-4111 recommended.
- 3441 Motivation and Emotion (3-0)**
A critical evaluation of present theories as to the causes of behavior. *Prerequisite:* Psychology 3221, 3310.
- 3442 Comparative Psychology (4-2)**
A study of behavior at different phylogenetic levels with emphasis on recent contributions from ethologists and psychologists. *Prerequisite:* Psychology 3221 or 6 hours of Biological Science or permission of instructor.
- 3451 Readings in Psychology**
Readings and papers in selected fields of psychology. Independent study under the supervision of a member of the faculty. May be repeated once when topics vary. *Prerequisite:* Permission of department head and instructor.
- 3452 Independent Research**
Independent student research under the supervision of a member of the faculty. Regular meetings and reports are required. *Prerequisite:* Permission of department head and instructor.
- 3453 Independent Research**
Independent student research under the supervision of a member of the faculty. Regular meetings and reports are required. May not be taken with same instructor as in Psychology 3452. *Prerequisite:* Permission of dept. head and instructor.
- 3454 Seminar in Psychology (3-0)**
Topic to be discussed will be selected. May be repeated with different instructors. Permission of instructor required.
- 3455 Honors Seminar in Psychology (3-0)**
Readings and discussion of contemporary topics in psychology. *Prerequisite:* Psychology major with senior standing and 3.5 average or above in psychology courses. Qualified students should consult the chairman of the department.
- 3460 Basic Correlational Methods. (3-0)**
Reviews correlational techniques, Pearsonian r , biserial r , point-biserial r and tetrachoric r , simple and multiple regression techniques and discusses their uses in research. *Prerequisite:* Psychology 3103.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Twelve semester hours of advanced courses in Psychology and a bachelor's degree.

- 1501-6501 Individual Research (0-3)**
Student, in conference with a member of the staff, will design and perform an original experiment. Results will be prepared for possible publication in a psychological journal. Permission is required from head of department.
- 3502 Advanced Experimental Psychology (3-1)**
A study of the experimental procedure appropriate for various areas. Each student will design, execute and report on one or more original experiments.
- 3503 General Psychology Seminar (3-0)**
Reports and discussions of contemporary problems and issues in psychology.

- 3505 Seminar in Industrial Psychology (3-0)**
Covers specialized topics such as morale and motivation, labor relations, consumer motivation, man-machine systems, personnel selection, and others.
- 3510 Seminar in Human Factors (3-0)**
Experimental psychology applied to the study of man-machine systems; psychological factors in the design of communication and control equipment. *Prerequisite:* A laboratory course in experimental psychology or the equivalent.
- 3511 Advanced Statistics: Experimental Design (3-0)**
Consideration of problems of analysis and design commonly encountered in psychological research. *Prerequisite:* Psychology 3417 or the equivalent.
- 3513 Seminar in Personality Theory (3-0)**
Intensive study of selected aspects of the various theories of personality.
- 3514 Seminar in Verbal Learning (3-0)**
Advanced studies of verbal learning in the light of advances in psycholinguistics.
- 3520 Seminar in Learning Theory (3-0)**
An analysis of theory, technique, and research conceptions of the learning process. *Prerequisite:* Psychology 3310 or equivalent.
- 3521 Seminar in Personality Assessment (2-2)**
Introduces the student to methods and issues in the evaluation of personality and acquaints him with the more widely used projective and objective instruments.
- 3522 Theories and Methods of Psychotherapy (3-0)**
An analysis of theory, technique, and research methods used in various current psychotherapies. Permission of instructor required.
- 3523 Individual Mental Tests (2-2)**
Supervised practice in the administration, scoring, and interpretation of individual tests of intelligence. Permission of instructor required.
- 3530 Seminar in Animal Behavior (3-0)**
A critical study of the most recent literature in animal behavior. The contributions of ethologists and psychologists will be reviewed.
- 3540 Introduction to School Psychology**
A study of the history, trends, and methods of school psychology, with emphasis on the roles and functions of the school psychologist.
- 3547 Seminar in Behavior Modification (3-0)**
Advanced study of conditioning techniques in the treatment of behavior disorders and in the control of human behavior. *Prerequisite:* Psychology 3421 or the equivalent.
- 3560 Clinical Internship (0-4)**
Supervised experience with clinical instruments. May be repeated once for credit. *Prerequisite:* Permission of instructor, Psychology 3521, 3523.
- 3598-99 Thesis Course for the Master's Degree**

SOCIOLOGY

W. G. STEGLICH, *Chairman*
Professors KRAENZEL, STEGLICH, STODDARD;
Associate Professors EYDE, GOODMAN, HIATT;
Assistant Professors BROWN, DUARTE, FAIRBANK, GERALD, HOUGH;
Lecturers ACUIRRE, ZIRL;
Instructors HAMBY, MORROW, WATLEY.

B.A. Degree — Specific requirements for a Sociology major are twenty-four semester hours of Sociology, eighteen of which must be at the advanced level (3300-3400). The following courses are required: Sociology 3101, 3201, and 3401.

The Anthropology option requires thirty semester hours of Anthropology, eighteen of which must be at the advanced level (3300-3400). The following courses are required: Anthropology 3101, 3102, 3301, 3302, and 3380. The following courses are recommended, though not required, for those contemplating graduate work in Anthropology: Anthropology 3216, 3217, 3220, 3303, and 3317.

Students who expect to pursue a career in social work upon completion of the B.A. degree, or who plan to continue their education at the graduate level in social work, should take in addition the following courses which constitute the undergraduate social work sequence: Social Work 3275, 3376, 3377, and 3475. See the list of Social Work courses at the end of this section.

SOCIOLOGY

Unless otherwise noted, Sociology 3101 is a prerequisite for all other courses in Sociology. Exceptions to this must receive permission from the Department Chairman.

3101 Principles of Sociology (3-0)

Nature and scope of sociology, its terminology and concepts; study of social processes, social institutions, development of society and characteristics of group life.

3102 Social Problems (3-0)

A study of selected social problems in our society, including causes, interrelationships, and programs of amelioration. *Prerequisite:* None; however, Sociology 3101 is recommended.

3201 Sociological Analysis (3-0)

Basic procedures and methodology of sociology as applied by the profession to various areas of social investigation.

3215 The Sociology of Marriage and the Family (3-0)

The historical development, current problems and prospects of the American marriage and family institutions. *Prerequisite:* None except sophomore standing.

3258 Chicanos in the Southwest (3-0)

Introductory course to major themes in Mexican American studies; cultural pluralism, bilingualism, biculturalism, ethnicity and race, assimilation, cultural nationalism, regionalism, folk culture. *Prerequisite:* None in Sociology.

3259 Chicanos and American Society (3-0)

Analysis of Chicano experiences in selected institutions such as schools, churches, governmental structures, military and mass media. *Prerequisite:* None in Sociology.

- 3301 Sociology of Educational Institutions (3-0)**
 Analysis of the social processes and interaction patterns in educational organizations; the relationships of the school to such aspects of society as social class and power; social relationships within the school; formal and informal groups; school culture; and the roles of teachers, students, and administrators.
- 3302 Social Legislation (3-0)**
 Survey of social legislation in Europe, the United States, and in representative states. Brief consideration of workman's compensation, unemployment, social security, pollution, and public welfare and of international and interstate aspects of these programs.
- 3303 Urban-Rural Sociology (3-0)**
 Analysis of urban and rural social systems, their differences and similarities, using the comparative approach in studying aspects of structure and organization.
- 3304 The Community (3-0)**
 A comparative study of community types; methods of studying the community, analyses of underlying social processes and institutions; trends and problems of community change.
- 3312 Measurement and Inference in Social Research (3-0)**
 Sociological factors and their measurement; development and use of scales; assumptions underlying the use of statistical models in analysis of social data; application and limitations of statistical analysis; recent trends in methodology.
- 3322 Collective Behavior and Social Movements (3-0)**
 Analysis of unstructured social behavior, including crowds, riots, revivals, fads, public opinion and social movements.
- 3327 Minority Groups in the United States (3-0)**
 A study of the principal minority groups in the United States and of the processes of accommodation, acculturation, and assimilation.
- 3333 Juvenile Delinquency (3-0)**
 An investigation of the social and legal definitions of juvenile delinquency; major theories of juvenile deviancy; the social system of the gang; factors contributing to apprehension, conviction, detention and parole; assessment of present and potential prevention programs.
- 3336 Comparative Cultures (3-0)**
 A comparison of values and institutions of the U. S. and Mexico emphasizing the fusion of culture along the U. S.-Mexican border region.
- 3340 Industrial Sociology (3-0)**
 A structural-functional analysis of management and labor organizations; social consequences of work and occupation in U. S. society; dynamic changes in automation and problems of leisure; community-industrial relations.
- 3342 Sociology of Deviance (3-0)**
 A study of deviations from social norms which encounter disapproval and to which theory and concepts derived from sociology and social psychology may be applied. Deviators and societal reaction to deviators are included.
- 3346 Sociology of Religion (3-0)**
 A study of the role of religion in society and its relation to other social institutions. Emphasis will be placed on the changing role of religion and its orientation to the values of society.
- 3348 Criminology (3-0)**
 Theories, causes, characteristics, and social function of crime in our society. Methods of prevention and reduction of crime will be analyzed.
- 3349 The Family as a Social Institution (3-0)**
 A study of the development of the family as a social institution. Includes the study of family under stress in various societies, emphasizing our own.

- 3352 Sociology of Poverty (3-0)**
A systematic survey of the causes of poverty, the characteristics of group living in poverty, and problems of dealing with impoverished peoples and the reduction of poverty.
- 3355 Contemporary Sociological Theory (3-0)**
Study of the major theories in contemporary sociology and of their development historically.
- 3360 Institutions and Cultures of Latin America (3-0)**
Survey of social institutions, the diverse cultures, and the processes of social change in Latin America.
- 3361 The Sociology of Regionalism (3-0)**
An analysis of regions as functional structures and organizations in social and political life, with special emphasis on a Great Plains model, but including others based on rivers or cities.
- 3362 Medical Sociology (3-0)**
Cultural factors in medical beliefs and practices; professionalization of medical practitioners; group factors in medical practice and medical care programs.
- 3380 Society and Personality (3-0)**
The social aspects of interpersonal interaction in the socialization process in small and complex groups.
- 3381 Complex Organizations (3-0)**
Examines structures, processes, interactions and human problems of modern organizations. Classical and contemporary sociological theories of organization are compared. Issues regarding organizational authority; change; conflict; control; cooperation; division of labor; efficiency; goals; and relationships with consumer-clients are studied.
- 3401 General Sociological Theory (3-0)**
Study of the major concepts of general sociology as these have been developed by contemporary sociologists and by the founding fathers of the field. *Prerequisite:* Sociology 3101, 3201, and nine hours of advanced sociology.
- 3410 Spanish-Speaking Peoples of the Southwest (3-0)**
Study of the historical, regional and generational differences of Southwestern Spanish-speaking peoples. Examines their social institutions and demographic characteristics as an urban, heterogeneous population.
- 3425 Social Class and Stratification (3-0)**
Social class differences in static and dynamic societies. Comparison of social stratification in the U.S. and U.S.S.R. Social class theories of Marx, Weber, and Michel. Measurement of social mobility in the U.S., U.S.S.R., and other societies.
- 3440 Independent Study**
Individual study in an area which is too specialized to be offered as an organized class. Supervised individual reading and research leading to development of a major paper or report. *Prerequisite:* 12 hours of advanced course work in sociology and consent of Department Chairman.
- 3447 Demography (3-0)**
Statistical analysis of the population of the world, the U. S. and the southwest. Study of fertility, mortality, and migration patterns.
- 3455 Social Change (3-0)**
Structural and functional requisites for effecting social change; latent consequences of unplanned change; resistance and implementation of social action programs; impact of technological change on social systems.
- 3465 Field Methods of Social Research (3-0)**
Nature of scientific research with emphasis upon actual field experience; techniques of social research from initial formulation of proposal, collection and analysis of data, to preparation of final report. *Prerequisite:* Twelve hours of Sociology.

FOR GRADUATE STUDENTS ONLY

Prerequisite: Graduate standing and consent of Department Graduate Advisor.

- 3510 Seminar in Social Organization (3-0)
- 3512 Seminar in Advanced Measurement and Inference (3-0)
- 3515 Seminar in Social Disorganization (3-0)
- 3518 Seminar in Social Differentiation (3-0)
- 3520 Seminar in Methodology (3-0)
- 3525 Seminar in Sociological Theory (3-0)
- 3540 Seminar in Demography (3-0)
- 3545 Seminar in Comparative Institutions (3-0)
- 3550 Seminar in Social Change and Social Processes (3-0)
- 3555 Seminar in Minority Groups (3-0)
- 3590 Individual Studies (may repeat for maximum credit of six hours.)
- 3598-99 Thesis

ANTHROPOLOGY

- 3101 **The Study of Man: His Body and Technologies (3-0)**
Introduction to the evolution of human behavioral systems with particular attention to the somatic and technological components. The biological development of man, from the 14 million year old ape-man *Ramapithecus* to modern *sapiens* man, is discussed and correlated with developments in house types, means of transportation, tool types, and other aspects of technology. This course is *not* a prerequisite to Anthropology 3102.
- 3102 **The Study of Man: His Societies and Cultures (3-0)**
Introduction to the evolution of human behavioral systems with particular attention to the social and cultural, or ideational components. The variety of types of societies and ideologies is discussed together with the ecological situations to which they are adapted. *Prerequisite:* None.
- 3205 **Chicanos and Their Culture (3-0)**
A survey of the history, economics, sociology, politics, demography, literature and thought of Mexican Americans as manifestations of their culture. Introduction to specialized study in the field.
- 3210 **Southwestern Archaeology (3-0)**
The development and characteristics of prehistoric Indian societies, from the Elephant Hunters to the Pueblos, is considered with particular attention to the Mogollon, Hohokam, Anasazi, and Casas Grandes areas. Ties of the area to nuclear Meso-America will be discussed. *Prerequisite:* None.
- 3211 **Southwestern Ethnology (3-0)**
A study of the economy, social life, religion, mythology, language, dwellings, and tool types of living Indian groups such as the Apache, Papago, Yuma, Navaho, Hopi, Zuni, and Rio Grande Pueblos. The influence of these Indian cultures on Hispanic and Anglo cultures in the area will also be discussed. *Prerequisite:* None.
- 3216 **World Ethnographic Survey (3-0)**
Human behavioral adaptations to a variety of natural environments and a variety of demographic situations are discussed with reference to specific ethnic groups, such as Eskimo, Hottentot, New Guinea Enga, Iroquois, Kongo, Zulu, and Trobrianders. *Prerequisite:* Anthropology 3102 or permission of instructor.
- 3217 **World Prehistory (3-0)**
A survey of the development of human technology from the earliest known bone, horn, and dental tools through hand axes, and blade and microlith tools, to metal types of the Bronze and Iron Ages. Social and cultural interpretations will be made where possible. *Prerequisite:* Anthropology 3101 or permission of instructor.
- 3220 **Introduction to Linguistics (3-0)**
(Same as Linguistics 3220). *Prerequisite:* None in Anthropology.
- 3301 **Primate Behavioral Systems (3-0)**
A comparative study of the morphology, sociology, technology, and ideology of the higher primates, including man. Attention will be directed to the adaptive

School of Liberal Arts

behavior of individuals and groups of cooperating individuals as they manipulate one another and the environment in order to satisfy their basic needs. *Prerequisite:* Anthropology 3101 and 3102.

3302 Comparative Social Systems (3-0)

Attention will focus on several classic studies in social anthropology with equal attention devoted to the social data and to the theoretical perspectives giving rise to those data. *Prerequisite:* Anthropology 3102 or permission of instructor.

3303 Ecological Anthropology (3-0)

Uses of ecological principles and models in anthropological description and explanation. Human societies as parts of larger eco-systems. Folk models of the eco-system will be discussed. Economic problems of production, distribution, and consumption in non-Western societies. *Prerequisite:* Anthropology 3102 or permission of instructor.

3312 Indians North of Mexico (3-0)

A survey to familiarize the student with the social, cultural and technological adaptations made by native peoples inhabiting the varied environmental zones of the present areas of the United States and Canada as they competed with other Indians and early European immigrants for the necessities for maintenance of their ways of life. *Prerequisite:* Anthropology 3102 or permission of instructor.

3313 Indians of Meso-America (3-0)

A survey of the forms of technology, social organization and culture of the Indians of Mexico and Central America. Both pre-conquest and contemporary groups will be considered. *Prerequisite:* Anthropology 3102 or permission of instructor.

3317 Peoples of Africa (3-0)

A survey of the cultures of some of the larger tribal groups of Africa, including those that produced the highly sophisticated civilizations that existed at the time of the first European contacts in the fifteenth century.

3320 Afro-American Culture (3-0)

An examination of the directions taken by African culture as it has been modified in the Western Hemisphere. Anthropological, sociological and literary sources will be utilized.

3379 Independent Study

Individual investigation of an area of anthropology that is not adequately covered by an organized class. Periodic meetings, reports and a major paper are required. *Prerequisite:* Permission of department chairman and instructor.

3380 Anthropology Theory (3-0)

A discussion of the goals of anthropology with a critical review of current theory and methodology. *Prerequisite:* Anthropology 3101 and 3102 or permission of instructor.

SOCIAL WORK

3275 Social Welfare as a Social Institution (3-0)

An examination of the social welfare field which focuses on the institutional nature of the social welfare system and its relationship to other institutions.

3376 Methods of Social Work Intervention I (3-0)

A general survey of the major methods employed by social workers in the social welfare field to help individuals, groups, and communities. *Prerequisite:* Social Work 3275.

3377 Methods of Social Work Intervention II (3-0)

Human behavior theories and their application to social work with emphasis on poverty and minority groups. *Prerequisite:* Social Work 3275 and 3376.

3475 Field Experience in Social Work (1-6)

A laboratory learning experience in selected social welfare agencies with weekly seminars. Students are assigned to specific agencies for the semester. *Prerequisite:* Social Work 3275 and 3376.

3476 Independent Field Study

Limited to students who have had Social Work 3475 and who have shown interest and capability of carrying out specialized work with minimum supervision. *Prerequisite:* Twelve hours of Social Work.



The University of Texas Nursing School System

DR. MARILYN D. WILLMAN, *President*

Austin, Texas

MISS CHRISTINE BONDS, *Dean*

El Paso, Texas

NURSING

The University of Texas Nursing School System offers Nursing courses at six locations Austin, Galveston, San Antonio, El Paso, Arlington and Houston.

The University of Texas School of Nursing at El Paso was established by the Legislature of the State of Texas in March of 1970.

Dr. Marilyn D. Willman is the President of the System-Wide Nursing School. Miss Christine Bonds is the Dean of The University of Texas School of Nursing at El Paso.

Students may attend The University of Texas at El Paso or any other accredited college or university for the first 60 required semester hours. An overall grade-point average of 2.0 and, in addition, a grade-point average of 2.0 on all required lower division courses, excluding electives, is required for admission to upper division nursing courses. The student will register at The University of Texas at El Paso for the entire

four years of the program, but will take the nursing courses at the Nursing School, which is located approximately one mile from the main campus, at 1101 North Campbell Street.

All junior students admitted to the University and stating a preference for nursing as a major will receive academic advisement from the School of Nursing faculty. **HOWEVER, ACCEPTANCE FOR ADVISEMENT DOES NOT CONSTITUTE A GUARANTEE THAT SUCH STUDENTS WILL BE SELECTED FOR ENROLLMENT IN THE NURSING SEQUENCE AT THE JUNIOR LEVEL.**

Upon satisfactory completion of the required 120 semester hours, the student will receive the degree of Bachelor of Science in Nursing from The University of Texas Nursing System.

Students who transfer from other universities, colleges, or junior colleges at the freshman or sophomore level must meet the admission requirements of The University of Texas at El Paso.

All inquiries regarding the courses required for the baccalaureate degree in Nursing should be addressed to Miss Christine Bonds, Dean, The University of Texas School of Nursing at El Paso, 1101 North Campbell Street, El Paso, Texas 79902.

Bachelor of Science in Nursing

	<i>Sem.</i> <i>Hrs.</i>		<i>Sem.</i> <i>Hrs.</i>
Freshman Year—1st Semester		Freshman Year—2nd Semester	
Biol. 3105 General Biology	3	Biol. 3106 General Biology	3
Biol. 1107 (Lab)	1	Biol. 1108 (Lab)	1
Psych. 3101 Intro. to Psych.	3	Psych. 3201 Child Psych.	3
English 3101 Freshman English	3	English 3102 Freshman English	3
History 3101 U.S. Hist. to 1865	3	History 3102 U.S. Hist. since 1865	3
Sociology 3101 Intro. to Soc.	3	Elective	4
	16		17
Sophomore Year—1st Semester		Sophomore Year—2nd Semester	
Biol. 4211 Biol. of Human Body	4	Pol. Sc. 3111 American Govt.	3
Biol. 1212 (Lab)	1	Psych. 3103 Statistics	3
Microbiology 3230 Gen. Micro.	3	Electives	10
Pol. Sc. 3110 American Govt.	3		16
	11		
Junior Year—1st Semester		Junior Year—2nd Semester	
Level I Nursing	15	Level II Nursing	12
	15	Elective	3
			15
Senior Year—1st Semester		Senior Year—2nd Semester	
Level III Nursing	12	Level IV Nursing	12
Elective	3	Elective Nursing	3
	15		15
Total Semester Credit Hours 120			

All elective courses must be approved by the Dean.



School of Science

JAMES W. WHALEN, *Dean*



SCHOOL OF SCIENCE

BIOLOGICAL SCIENCES

ALBERT G. CANARIS, *Chairman*

JAMES B. REEVES, *Coordinator, Office of Health Related Programs*

Professors BERKMAN (emeritus), CANARIS, EKLUND, HARRIS, METCALF, REEVES, ROBERTSTAD, WEBB; *Associate Professors* CHRAPLIWY, DUKE, HUNTER, WILLIAMS; *Assistant Professors* BRISTOL, ELLZEY, FREEMAN, MANNING, TULLEY, WORTHINGTON; *Lecturer* L. JONES; *Teaching Assistants* ARROYO, BORNSTEIN, BUTCHER, CRAWFORD, DE SOCARRAZ, HELLER, HIGHTOWER, MARKEL, MUNDEL.

Thirty semester hours of Biological Sciences are required for the Bachelor of Arts degree, fifteen of which must be advanced. Students working toward the B.A. degree must register in the School of Liberal Arts.

Thirty-eight semester hours of Biological Sciences are required for the Bachelor of Science degree, eighteen of which must be advanced. Students working toward the B.S. degree must register in the School of Science.

A student, at his option, may pursue a field of concentration in Microbiology, Plant Sciences or Zoology. Those choosing Plant Sciences or Zoology *must complete* the Department Core Program and are asked to quickly do so. These represent the essential elements of Biological Sciences and are marked with an asterisk. Those specializing in Microbiology will complete the following Core courses: Biology 3105-06, Biology 1107-08, Biology 3214, Biology 1215, Biology 3216, Biology 1217, and Biology 3320. A student may minor in any of these fields providing the major and minor are not in the same area.

All Biological Sciences majors are required to have at least eight semester hours of Chemistry.

Mathematics required are 4111 and 3212 or 4111 and Statistics 3280, 1282, 3281, 1283.

BIOLOGY

For Undergraduates

3105-06 General Biology* (3-0) [Formerly Bio. 4110, Bot. 4103, Zool. 4103]
A modern approach to the principles of biology, stressing the evolutionary relationships of plants and animals to success in their biosphere. *Prerequisite for all other biology courses:* Biology 1107 concurrent with Biology 3105 and Biology 1108 concurrent with Biology 3106.

1107 Topics in the Study of Life* (I) (0-2)
Elementary aspects of cell structure, function, nutrition and reproduction. Concurrent with Biology 3105.

1108 Topics in the Study of Life* (II) (0-2)
Elementary aspects of evolution, physiology, development, genetics and ecology in plants and animals. Concurrent with Biology 3106.

4211 Biology of the Human Body (4-0) [Formerly Bio. 4202-Bio. 4203]
Correlated structure and function of human organ systems. Concurrent with Biology 1212. *Prerequisite:* Biology 3105-06, Biology 1107-08.

1212 Exercises in Human Physiology (0-2)
Methods in and principles of human anatomy and physiology. Concurrent with Biology 4211.

*Core courses.

3214 Functional Biology* (3-0) [Formerly Biology 4327, Botany 4313]
 Biochemistry and physiology of prokaryotic and eukaryotic organisms. Homeostasis, metabolism, membrane structure, conduction, contraction and pigmentation. Concurrent with Biology 1215. *Prerequisite:* Biology 3105-06, Biology 1107-08 and eight Hours of Chemistry.

1215 Functional Biology Techniques * (0-3)
 Experimental techniques with prokaryotic and eukaryotic organisms. Respirometry, photometry, colorimetry, paper and column chromatography, electrophoresis, measurement of bioelectrical events. Concurrent with Biology 3214.

3216 General Ecology* (3-0) [Formerly Botany 3301, Zool. 3303, Zool. 4306]
 Relations of biota to the physical and biological environment. *Prerequisite:* Biology 3105-06, Biology 1107-08. Biology majors must take Biology 1217; non-majors may take Biology 3216 without Biology 1217.

1217 General Ecology Investigative Techniques * (0-3)
 Demonstrations and application of ecological concepts with emphasis on field work. Concurrent with Biology 3216 or may be taken later.

For Undergraduates and Graduates

3318 Developmental Biology* (3-0) [Formerly Zool. 5201, or 3301, or 3302]
 A study of growth, differentiation and developmental patterns in microbes, plants and animals. Concurrent with Biology 1319. *Prerequisite:* Biology 3105-06, Biology 1107-08.

1319 Experimental Embryology * (0-3)
 Techniques and observations of differentiation and regeneration in invertebrates and vertebrates, as well as regulatory patterns of plant hormones. Concurrent with Biology 3318.

3320 Genetics* (3-0) [Formerly Biology 3304]
 The nature and functions of hereditary material with emphasis on the experimental procedures and data that have led to the current concepts in genetics. *Prerequisite:* Biology 3105-06, Biology 1107-08.

3321 Evolutionary Theory* (3-0) [Formerly Biology 3314]
 Development of evolutionary thought, evidences of evolution and the evolutionary processes. *Prerequisite:* Biology 3105-06, Biology 1107-08.

3422 Biological Ultrastructure Interpretation (3-0) [Formerly Bio. 4327]
 Morphology, chemical nature and physiology of eukaryotic organelles and cell processes. Concurrent with Biology 2423. *Prerequisite:* Biology 3105-06 Biology 1107-08, Biology 3214, Biology 3318 and eight hours of Chemistry.

2423 Methodology in Biological Ultrastructure (0-4)
 Techniques and instruments used to analyze cell structure and function. Concurrent with Biology 3422.

3424 Animal Behavior (3-0) [Formerly Zoology 3511]
 Theories, experiments and field studies that elucidate the behavior of animals. *Prerequisite:* Senior standing.

6425 Field Biology (Fee varies. Summer only.) [Formerly Biology 6465]
 Collection and study of organisms under field conditions. *Prerequisite:* Core and consent of instructor.

2498-6498 Special Problems
 Credit will be granted up to six semester hours for research satisfactorily completed by advanced students. Only specially qualified students will be accepted for this work. *Prerequisite:* Consent of the instructor.

MICROBIOLOGY For Undergraduates

2240 General Microbiology (2-0) [Formerly Microbiology 4202]
 Survey of the different types of microorganisms and their characteristics; aspects of biochemical cytology, physiology and genetics; introduction to areas of applied microbiology. Concurrent with Microbiology 2241. *Prerequisite:* Biology 3105-06, Biology 1107-08, Biology 3214, Biology 1215.

2241 General Microbiology Methods (0-4)

Techniques used to study pure cultures and physiological characteristics of microorganisms, introduction to the applications of microbiology. Concurrent with Microbiology 2240.

3230 Microorganisms and Disease (3-0)

A survey of microorganisms important to man with emphasis on those pathogenic for man; laboratory demonstrations of diagnostic procedures for pathogenicity of and immune responses to the more common pathogens. A terminal course not to be used as a prerequisite for any other course. A course for non-majors, including those in nursing program. *Prerequisites:* Biology 3105-06, Biology 1107-08.

For Undergraduates and Graduates

3335 Mycology (2-0)

[Formerly Botany 3323]

Phylogenetic relationships among fungi as determined by taxonomy, biochemistry, ultrastructure, and cytochemistry. Stresses non-pathogenic species. Concurrent with Microbiology 1336. *Prerequisite:* Biology 3105-06, 1107-08 and Junior standing.

1336 Mycological Techniques (0-3)

Identification of fungi with the aid of various culture techniques and types of microscopy. Concurrent with Microbiology 3335.

3343 Pathogenic Microbiology (3-0)

[Formerly Microbiology 4302]

A study of the epidemiology, pathogenicity and host response to disease-producing microorganisms. Concurrent with Microbiology 1344. *Prerequisite:* Microbiology 2240 or equivalent as determined by instructor.

1344 Diagnostic Bacteriology (0-3)

The practical application of diagnostic procedures for isolating and identifying pathogenic microorganisms and ancillary procedures in disease diagnosis. Concurrent with Microbiology 3343.

2347 Determinative Microbiology (2-0)

Cultivation, characterization, and systematics of microorganisms. Concurrent with Microbiology 2348. *Prerequisites:* Microbiology 2240 and Microbiology 2241.

2348 Determinative Techniques (0-6)

Principles of sterilization, preparation and use of culture media, enrichment cultures, and modern identification techniques. Concurrent with Microbiology 2347. *Prerequisites:* Microbiology 2240 and Microbiology 2241.

3345 Microbial Physiology (3-0)

[Formerly Microbiology 3333]

Biochemical cytology, growth, nutrition, metabolism and genetics of microorganisms. Concurrent with Microbiology 1346. *Prerequisite:* Microbiology 2240, Microbiology 2241, Chemistry 2224 or Chemistry 4324.

3349 Bacterial Genetics (3-0)

The evolution, cytological basis, and molecular aspects of bacterial genetics; population changes; types of genetic transfer; regulatory genes. *Prerequisites:* Microbiology 2240 and Microbiology 2241.

1346 Microbial Physiology Methods (0-3)

Techniques used to study structures and physiological activities of microbial cells. Concurrent with Microbiology 3345. *Prerequisite:* Microbiology 2240, Microbiology 2241, Chemistry 2224 or Chemistry 4324.

3451 General Virology (3-0)

[Formerly Microbiology 4425]

Structural, physiological and genetic aspects of bacterial, animal and plant viruses. Concurrent with Microbiology 1452. *Prerequisite:* Microbiology 2240, Microbiology 2241, Microbiology 3345 or consent of instructor.

1452 General Virology Techniques (0-3)

Techniques used to study viruses. Concurrent with Microbiology 3451.

3453 Immunology (3-0)

[Formerly Microbiology 4460]

Antigens and antibodies, humoral and cellular immunity, in vitro reactions, cell types in immune processes, transplants. Concurrent with Microbiology 1454. *Prerequisite:* Microbiology 3343, Microbiology 1344, Chemistry 4224.

- 1454 Immunology Techniques (0-3)**
Antigen-antibody reactions as applied to diagnosis and research, in vitro reactions, immunoelectrophoresis, fluorescent antibody techniques, hypersensitive reactions. Concurrent with Microbiology 3453.
- 2455 Medical Mycology (2-0)** [Formerly Microbiology 4461]
A study of the fungi of medical importance. Concurrent with Microbiology 1456. *Prerequisite:* Microbiology 2240, Microbiology 1344.
- 1456 Medical Mycology Techniques (0-3)**
Diagnosis and identification of medically important fungi. Concurrent with Microbiology 3455.
- 3457 Environmental Microbiology (3-0)**
Environmental microbiology and microbial ecology; use of microbes in the transformation of wastes. Concurrent with Microbiology 1458. *Prerequisites:* Microbiology 2240, Microbiology 2241, Microbiology 3345, and Microbiology 1346.
- 1458 Environmental Microbiology Techniques (0-3)**
Techniques employed in studying microbial ecology and environmental microbiology. Concurrent with Microbiology 3457. *Prerequisites:* Microbiology 2240, Microbiology 2241, Microbiology 3345, and Microbiology 1346.

PLANT SCIENCES For Undergraduates

- 3230 Comparative Plant Morphology (3-0)** [Formerly Botany 3210]
Life histories, phylogenetic relationship of vascular and non-vascular plants. Concurrent with Plant Sciences 1231. *Prerequisite:* Biology 3105-06, Biology 1107-08.
- 1231 Comparative Plant Morphology Techniques (0-3)**
Examination of living and prepared plant material. Concurrent with Plant Sciences 3230.

For Undergraduates and Graduates

- 3332 Economic Botany (3-0)** [Formerly Botany 3304]
The origin and utilization of plants important to man, and interrelated nutrition problems between man and plants. *Prerequisite:* Biology 3105-06, Biology 1107-08.
- 3333 Plant Anatomy (3-0)** [Formerly Botany 3320]
Initiation, development and structure of cells, tissues and tissue systems in roots, stems, leaves and flowers. Concurrent with Plant Sciences 1334. *Prerequisite:* Biology 3105-06, Biology 1107-08.
- 1334 Plant Anatomy Techniques (0-3)**
Microscopic studies of the internal structure of flowering plants. Concurrent with Plant Sciences 3333.
- 3335 Mycology (2-0)** [Formerly Botany 3323]
Phylogenetic relationships among fungi as determined by taxonomy, biochemistry, ultrastructure and cytochemistry. Stresses non-pathogenic species. Concurrent with Plant Sciences 1336. *Prerequisite:* Biology 3105-06, Biology 1107-08 and junior standing.
- 1336 Mycological Techniques (0-3)**
Identification of fungi with the aid of various culture techniques and types of microscopy. Concurrent with Plant Sciences 3335.
- 2337 Plant Taxonomy (2-0)** [Formerly Botany 3211, Botany 3414]
Characteristics, classification and phylogenetic studies of native and ornamental vegetation. Concurrent with Plant Sciences 2338. *Prerequisite:* Biology 3105-06, Biology 1107-08. Consent of instructor.
- 2338 Plant Identification Techniques (0-4)**
Collection, systematic identification and preservation of Southwestern flowering plants. Concurrent with Plant Sciences 2337. *Prerequisite:* Consent of instructor.
- 3437 Plant Geography (3-0)** [Formerly Botany 3415]
Geographical distribution of the major plant taxa of the world. Principles and factors governing plant distribution. *Prerequisite:* Ten hours of Plant Sciences.

ZOOLOGY

For Undergraduates

- 2264 Medical Parasitology (2-0)** [Formerly Zoology 3305]
A survey of medically important parasites. Concurrent with Zoology 1265. *Prerequisite:* Biology 3105-06, Biology 1107-08.
- 1265 Identification of Human Parasites (0-3)**
Techniques used to identify human parasites and infections. Concurrent with Zoology 2264.

For Undergraduates and Graduates

- 3366 Invertebrate Zoology (3-0)** [Formerly Zoology 4464]
Survey of the invertebrates, exclusive of protozoa and insects, stressing phylogeny. Concurrent with Zoology 1367. *Prerequisite:* Biology 3105-06, Biology 1107-08.
- 1367 Invertebrate Zoology Investigative Techniques (0-3)**
Morphology and taxonomy of invertebrates, exclusive of protozoa and insects. Concurrent with Zoology 3366.
- 2368 Entomology (2-0)** [Formerly Zoology 3307]
Morphology, taxonomy and life histories of insects. Concurrent with Zoology 1369. *Prerequisite:* Twelve hours of Biological Sciences and junior standing.
- 1369 Entomology Techniques (0-3)**
Observation, collection and identification of insects. Concurrent with Zoology 2368.
- 3470 Protozoology (3-0)** [Formerly Zoology 4463]
The morphology, taxonomy and physiology of the free-living and symbiotic protozoa. Concurrent with Zoology 1471. *Prerequisite:* Senior standing. May be counted as Zoology or Microbiology.
- 1471 Protozoological Methods and Techniques (0-3)**
Concurrent with Zoology 3470.
- 1472 Ecology of Animal Parasites (2-0)**
Distribution, origin, evolution, environment, host relations and metabolism of parasites. Concurrent with Zoology 2473. *Prerequisite:* 16 hours of Biological Sciences and eight hours of Chemistry.
- 2473 Investigative Techniques, Animal Parasitology (0-3)**
Research project culminating in a written paper. Concurrent with Zoology 1472.
- 3474 Invertebrate Physiology (3-0)**
Physiological mechanisms of ionic and osmotic regulation. Nitrogen excretion, circulation, respiration, temperature tolerance and endocrine regulation in invertebrate phyla. Comparative aspects of neuromuscular systems. Concurrent with Zoology 1475. *Prerequisite:* Core and 16 hours of Chemistry.
- 1475 Investigative Techniques in Invertebrate Physiology (0-3)**
Instrumentation and investigative techniques involved in studying the invertebrates, both fresh and salt water. Concurrent with Zoology 3474.
- 3476 Lower Vertebrates (3-0)**
Classification and natural history of fish, amphibians and reptiles. Concurrent with Zoology 1477. *Prerequisite:* 14 Core hours.
- 1477 Lower Vertebrates Identification Techniques (0-3)**
Recognition of selected, local fish, amphibians and reptiles; methods of preparation of study specimens and techniques of collection and data gathering. Concurrent with Zoology 3476.
- 3478 Higher Vertebrates (3-0)** [Formerly Zoology 3204, Zoology 3506]
History of study, literature and biology of birds and mammals. Concurrent with Zoology 1479. *Prerequisite:* 14 Core hours.
- 1479 Higher Vertebrate Research Techniques (0-3)**
Methods of study and familiarization with Southwestern species. Overnight field trips are required. Concurrent with Zoology 3478.

- 3480 Vertebrate Physiology (3-0)** [Formerly Zoology 4304]
Vertebrate systemic functions emphasizing nerve action and movement, endocrinology and metabolic controls, osmoregulation, cardiophysiology and respiration. Concurrent with Zoology 1481. *Prerequisite:* Core and 8 hours Chemistry.
- 1481 Vertebrate Physiology Methods (0-3)**
Techniques and instrumentation used in study of vertebrate function. Concurrent with Zoology 3480.

FOR GRADUATE STUDENTS ONLY

Departmental Requirements for M.S. Degree

Thirty semester hours are required for the degree. Nine semester hours of undergraduate division courses (0300 or 0400) may be counted for graduate credit. A minimum of 21 of the 30 semester hours must be in graduate courses (0500), of which six hours of Thesis (Biology 3598-3599) will be counted toward the 30 semester hour requirement. Biology 2502-5502 (Problems in the Biological Sciences) may be taken for not more than a total of six hours credit toward the 30 semester hour requirement. Six hours in a supporting area minor may be accepted by the department. A thesis describing original work is required and must be defended orally before receiving the degree.

GRADUATE COURSES

- 3501 Selected Advanced Topics in the Biological Sciences (3-0)**
Topics vary with student background and instructor.
- 2502-5502 Problems in the Biological Sciences**
Research, writing and discussion in the Biological Sciences.
- 3504 Developmental Cytology (3-0)**
Cellular and molecular aspects of plant and animal development.
- 3505 Herpetology (3-3)**
A study of the morphology, taxonomy and life histories of reptiles and amphibians.
- 3507 Biology of the Pleistocene (3-0)**
A study of the organisms of the Pleistocene.
- 3509 Microbial Genetics (3-0)**
A study of the genetics of microorganisms.
- 3512 Recent Advances in Microbiology (3-0)**
- 3513 Biogeography (3-0)**
Geographic distribution of plants and animals, reasons for and analysis of distributions.
- 3514 Physiological Ecology (3-3)**
Physiological adaptations of organisms to different environments, desert adaptations emphasized.
- 3515 Analytical Cytology (1-4)**
Modern techniques of phase microscopy, fluorescence microscopy, autoradiography, polarization microscopy and electron microscopy.
- 3516 Biosystematics (3-0)**
Methods and principles of taxonomy, classification, and systematics.
- 3517 Plant Ecology (3-0)**
Plant communities and factors determining them.
- 3518 Identification and Ecology of Desert Plants (3-3)**
The identification and adaptation of desert plants.

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- 3519 Ecology and Physiology of Animal Parasites (2-3)**
Field and laboratory investigations of animal parasites.
- 3520 Neuroendocrine and Sensory Physiology (3-3)**
Neural control of endocrine secretion in vertebrates and invertebrates.
- 3521 Archaeobiology (3-3)**
Recovery, processing, and interpretation of biological materials associated with prehistoric and historic man in the New World.
- 3522 Malacology (3-3)**
A survey of mollusks, emphasizing the fauna of the Southwest.
- 3523 Ultrastructure (3-0)**
Current research advances in Cellular Biology.
- 3524 Mammalogy (3-3)**
Class Mammalia, with emphasis on morphologic, physiologic, ecologic, and behavioral adaptations to past and present environments.
- 3598-99 Thesis**

CHEMISTRY

WILLIAM C. HERNDON, *Chairman**Professors* ALEXANDER, DAVIS, HANCOCK, HATCH, HERNDON, LEVITT, PARKANYI,
WHALEN;*Associate Professors* CABANESS, LLOYD, PANNELL, PRATER, RIVERA;*Assistant Professors* EASTMAN, ELLZEY, SCRUGGS.

B.S. Degree — The minimum course requirements in Chemistry for the Bachelor of Science Degree are Chemistry 3105-06, 2106, 4213, 3262, 1200, 3321-22, 1321-22, 3351-52, 1351-52, 4411, 3465, two additional advanced courses in Chemistry one of which must be a laboratory course and German 3103-04. An advanced course in Physics or Mathematics may be substituted for one advanced elective course in Chemistry.

B.A. Degree — The minimum course requirements in Chemistry for the Bachelor of Arts Degree are Chemistry 3105-06, 2106, 4213, 3262, 3321-22, 1321-22, 3351-52 and 1351-52.

An entering Freshman student with at least one year of high school chemistry with an "A" or "B" in chemistry and a SAT score of at least 1000 may take an Achievement Examination given by the department. If a student scores 80 or above, he will be given the corresponding grade AND credit for Chemistry 3105.

An entering Freshman student with two years of high school chemistry with grades of "A" or "B" and a SAT score of at least 1000 may take Achievement Examinations given by the department over Chemistry 3105 and 3106. If he scores 80 or above, he will be given the corresponding grade and credit for Chemistry 3105 and 3106.

An entering Freshman student with the above qualifications and who scores less than 80 on the Achievement Examination may, at the discretion of the department be allowed to enter the next higher course without credit granted.

For Undergraduates

General prerequisite: Junior standing for all 3300 or 3400 level courses.

3103-04 Chemistry, Contemporary Applications (2-3)

Consideration of the role of chemistry in the natural and social environment and application to life processes. Satisfies laboratory science requirement for the liberal arts student. May not be used as a prerequisite for any other chemistry course.

3105-06 General Chemistry (3-0)

[Formerly 4103-04]

The laws and theories of chemistry; the elements and their most important compounds with reference to their production and use. For students who need a foundation for work in advanced chemistry and related science. *Prerequisite:* A one-year high school chemistry course. *Prerequisite:* Math 4110 or equivalent. Concurrent enrollment Chemistry 3106-2106 required.

4105 General Chemistry (4-0)

Includes more introductory material than Chemistry 3105. Designed for students who have not had a course in high school chemistry. Serves as a prerequisite for Chemistry 3106.

2106 Laboratory for Chemistry 3106 (0-6)**2224-25 Organic Chemistry (3-0)**

Applied organic chemistry intended for engineering students. *Prerequisite:* Chemistry 3106.

3262 Structure of Matter (3-0)

Introduction to Quantum Theory; atomic and molecular structure; atomic and molecular spectra; chemical bonding. *Prerequisite:* Physics 4216-1102 concurrently.

- 1200 Techniques in Chemistry (0-3)**
Skills of general usefulness in advanced chemical work. *Prerequisite:* Chemistry 3106.
- 4213 Analytical Chemistry (2-6)** [Formerly 5213]
Analytical chemical practices, separations, identifications and quantitative measurements. *Prerequisite:* Chemistry 3106.
- 3324-25 Organic Chemistry (3-0)** [Formerly 4324-25]
A study of the fundamental types of carbon compounds. Intended for students not requiring the detailed theoretical course required for Chemistry majors. May not be counted in addition to Chemistry 3321-22. *Prerequisite:* Chemistry 3105-06.
- 1324-25 Laboratory for Chemistry 3324-25 (0-3)**

For Undergraduates and Graduates

- 3321-22 Organic Chemistry (3-0)** [Formerly 4321-22]
A study of chemical bonding and structure in organic molecules, functional group synthesis and reactions, reaction mechanisms, nomenclature, and isomerism. Intended for Chemistry majors and others requiring a modern theoretical approach to organic chemistry. Concurrent enrollment in Chemistry 3321-1321 and in Chemistry 3322-1322 required. *Prerequisite:* Chemistry 3262. May not be counted in addition to 3324-25 or 2224-25.
- 1321-22 Laboratory for Chemistry 3321-22 (0-5)**
- 3351-52 Physical Chemistry (3-0)** [Formerly 4360-61]
Properties of substances in gaseous, liquid and solid states; solutions, thermodynamics, kinetics and other advanced topics. Concurrent enrollment in Chemistry 3351-1351 and in Chemistry 3352-1352 required. *Prerequisite:* Chemistry 3106, Mathematics 3212 and Physics 4216.
- 1351-52 Laboratory for Chemistry 3351-52 (0-4)**
- 3381 Organic Chemistry**
A survey of organic chemistry for the life sciences. May not be counted in addition to Chem 3321 or 3324. May not be counted toward a major in Chem. *Prerequisite:* Chem 3106 and concurrent registration in Chem 1381.
- 1381 Laboratory for Chemistry 3381**
- 3382 Biochemistry**
A survey of the chemistry of living systems. May not be counted toward a major in chemistry. *Prerequisite:* Chem 3321, 3324 or 3381 and concurrent registration in Chem 1382.
- 1382 Laboratory for Chemistry 3382**
- 3383 Physical Chemistry**
A survey of physical chemistry as applied to the life sciences. May not be counted toward a major in chemistry. *Prerequisite:* Chem 3106, completion of the math requirement for life sciences majors, and concurrent registration in Chem 1383.
- 1383 Laboratory for Chemistry 3383**
- 3423 Organic Chemistry (3-0)**
A third semester of organic chemistry for those who plan to do advanced work in organic chemistry. *Prerequisite:* Chemistry 3322.
- 3428 Advanced Topics in Organic Chemistry (3-0)**
Selected topics at the undergraduate level which are not usually covered in introductory courses in organic chemistry. Courses may be repeated for credit when topics vary. *Prerequisite:* Chemistry 3322.
- 3430 Biochemistry (3-0)**
Chemistry of food substances, digestion, vitamins, enzymes, absorption, and blood. May not be counted as advanced hours toward BS degree in Chemistry. *Prerequisite:* Chemistry 3325-1325 or 3322.

- 3431 Biochemistry (3-0)**
Chemistry of respiration, hormones, intermediary metabolism, etc., with emphasis on cell metabolism. May not be counted as advanced hours toward BS degree in Chemistry. *Prerequisite:* Chemistry 3430 or Chemistry 3432.
- 3432 Physical Biochemistry (3-0)**
Enzyme systems, hormones, redox reactions with emphasis on kinetics and thermodynamics of biological processes. *Prerequisites:* Chemistry 3322, Chemistry 3351.
- 4411 Instrumental Methods of Analytical Chemistry (2-6)** [Formerly 4450]
A study of the more important optical and electrical methods of chemical analysis. *Prerequisite:* Chemistry 3352-1352.
- 3454 Advanced Topics in Physical Chemistry (3-0)**
Topics selected from quantum theory, statistical thermodynamics, surface chemistry, photochemistry, chemical kinetics and other areas of physical chemistry. Course may be repeated for credit when topics vary. *Prerequisite:* Chemistry 3352.
- 3465 Inorganic Chemistry (3-0)**
Principles of molecular structure and chemical reactivity of inorganic compounds; coordination chemistry and introduction to ligand field theory; kinetics and mechanism of inorganic reactions; organometallic compounds; chemistry of non-metals and physical methods in inorganic chemistry. *Prerequisites:* Chemistry 3262, Chemistry 3351; corequisite: Chemistry 3352.
- 1465 A Laboratory Course in Inorganic Chemistry (0-3)**
Provides laboratory practical exposure for students taking Inorganic Chemistry 3465.
- 4420 Analytical Organic Chemistry (1-9)** [Formerly 3468]
Identification techniques and functional group analysis of organic compounds. *Prerequisite:* Chemistry 3322, Chemistry 4411.
- 4470 Radiochemistry (3-3)**
Fundamental principles of radioactivity, theory and operation of radiation measurement devices, separation techniques, preparation and handling of radioactive samples; radioisotope applications. *Prerequisite:* Mathematics 3212; Physics 4216-1102; Chemistry 3352.
- 2476 Introduction to Research**
Credit will be granted only upon completion of research in the Senior year on the recommendation of the Head of the Chemistry Department. *Prerequisite:* Permission of the Instructor.

FOR GRADUATE STUDENTS ONLY

The department offers a program of study and research leading to the degree of Master of Science in Chemistry. In addition to the institutional requirements for a Master of Science degree, which include a thesis, the candidate must also meet the following stipulations. A minimum of 21 of the required 30 hours of credits must be in courses at the 0500 level. Credits must include at least one graduate level course in three of the four areas of organic chemistry, physical chemistry, inorganic chemistry or analytical chemistry. The candidate must also enroll in Chemistry 1595 during each semester of residence. Not more than one hour of Chemistry 1595 may be counted toward the 30 credit hour requirement. The normal program for the MS degree in Chemistry will include 6-hour supporting work from approved fields (Biology, Geology, Mathematics, Physics or Engineering). At least 3 hours of this minor must be completed in residence. A program of specialization in chemical physics may be elected with the permission of the graduate adviser. Such a program may include within the required 30 hours of credits in excess of 6 hours but not more than 12 hours in the related fields (e.g.,

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Physics, Mathematics). Courses of study are designed for each student in consultation with his adviser. The thesis presented for this degree must describe original work related to a research problem of some importance. The thesis must be defended orally.

- 3518 Advanced Analytical Chemistry (3-0)**
Chemical equilibrium and its application to separation and analysis.
- 3519 Contemporary Topics in Analytical Chemistry * ((3-0)**
Selected topics of current interest in modern analytical chemistry.
- 3521 Advanced Organic Chemistry I (3-0)**
A survey of the more important type of reactions in organic chemistry: Reaction mechanisms; stereochemistry of intermediates and products; current structural theory. *Prerequisite:* Chemistry 3322.
- 3522 Advanced Organic Chemistry II (3-0)**
A continuation of Chemistry 3521. *Prerequisite:* Chemistry 3521.
- 3529 Contemporary Topics in Organic Chemistry * (3-0)**
Selected topics of current interest in descriptive and theoretical organic chemistry.
- 3539 Contemporary Topics in Biochemistry * (3-0)**
Selected topics of current interest in organic or physical aspects of biological chemistry.
- 3551 Advanced Physical Chemistry I (3-0)**
Schroedinger wave mechanics; atomic and molecular quantum states; applications to the treatment of wave functions for atoms and molecules.
- 3552 Advanced Physical Chemistry II (3-0)**
Classical and statistical thermodynamics; applications to physical and chemical systems.
- 3559 Contemporary Topics in Physical Chemistry * (3-0)**
Selected topics of current interest in experimental and theoretical fields of physical chemistry.
- 3561 Advanced Inorganic Chemistry (3-0)**
Ionic, metallic and covalent bonding; valence bond, molecular orbital and ligand field theories; structure and properties of coordination compounds, metal carbonyls and pi-complexes.
- 3569 Contemporary Topics in Inorganic Chemistry * (3-0)**
Selected topics in theoretical inorganic chemistry.
- 1595 Graduate Seminar (1-0)**
- 1596-6596 Graduate Research in Chemistry**
Prerequisite: Graduate standing and staff consent.
- 3598-3599 Research for the MS Degree**

*May be repeated for credit when topics vary.

GEOLOGICAL SCIENCES

W. N. McANULTY, *Chairman*

Professors STRAIN, QUINN (Emeritus), HILLS, HOFFER, KLEMENT, KIERSCH, McANULTY;
Associate Professors LEMONE, LOVEJOY, SCHMIDT, SHANNON;
Assistant Professors MUELLER, CORNELL; *Instructor* JACKSON.

GEOLOGY

B.S. Degree — Specific course requirements for the geology major are Geology 4101-02, 4216-17, 4220, 4323, 3327, 6465, 3471 and nine additional advanced hours in geology, at least six of which must be senior-level courses having direct economic application; Chemistry 3105, 3106, 2106; Physics 4103-04, or 3115 and 3217 (Paleontology majors may substitute Biology 3105-06, 1107, 1108 for Physics); Mathematics 4110 and 4111; Statistics 3201 and 3301 or Mathematics 3324, and Geography 3208.

An 18 hour (minimum) minor, six hours of which must be advanced, must be chosen from one of the following fields: Biological Sciences, Chemistry, Geography, Mathematics, Physics, Civil or Metallurgical Engineering. The students who plan to pursue graduate study should take at least 8 hours of a foreign language. Students planning to become professional geologists should take the B.S. degree program.

B.A. Degree — Specific course requirements for the geology majors are Geology 4101-02, 4216-17, 4220, 4323, 3327, 6465, and 3471; Chemistry 3105, 3106, 2106; Physics 4103-04, or 3115, and 3217, (Paleontology majors may substitute Biology 3105-06, 1107, 1108 for Physics); Mathematics 4110 and 4111; Business 3201 and 3301 or Mathematics 3324, and Geography 3208.

An 18 hour minor, six hours of which must be advanced, must be chosen in a suitable field in liberal arts.

Students desiring to major or minor in Geological Sciences should consult with the Head of the Department.

The Department also offers the Master of Science Degree in Geology. The Graduate School Bulletin should be consulted for additional information.

For Undergraduates

General prerequisite: Junior standing for all 3300 or 3400 level courses.

3103 Principles of Earth Science

Study of the earth as a planet: A survey of the physical processes operating in the atmosphere, lithosphere, and biosphere. Includes an introduction to meteorology, physical geology, soils, and vegetation. A one-day field trip is required. For non-geology majors.

3104 Principles of Earth Science

Study of the Earth as a planet: A survey of earth history as interpreted from and exhibited by plants, animals, rocks and minerals; a study of the earth in space; a survey of the physical processes operating in the hydrosphere. Includes an introduction to historical geology, astronomy, physiography, and oceanography. A one-day field trip is required. For non-geology majors.

4101-02 Physical and Historical Geology (3-3)

The first course, 4101, of this two semester sequence deals with principles and processes of physical geology. The second course is a critical study of the principles of historical geology. These courses must be taken in sequence. Required for all students majoring and minoring in geology. Recommended for all students majoring in any of the sciences or engineering. A one-day field trip is required in each course.

- 3205 Principles of Geology (for Teachers of Earth Science) Fall Semester (2-3)**
Study of the principles and processes of physical and historical geology. Designed for Education and Liberal Arts majors. A one-day field trip is required. *Prerequisite:* Geology 3104. Not open to students who have completed Geology 4101 and/or 4102.
- 2215 Mineralogy for Metallurgists Spring Semester (1-3)**
A study of the Physical and Chemical properties of the common ore and gangue minerals and use of these properties in the identification of these minerals. *Prerequisite:* Chemistry 3105-06.
- 4216 Mineralogy Fall Semester (3-3)**
Elementary study of crystallography, crystal chemistry, classification and physical properties of minerals, and identification of the common silicate and ore minerals. *Prerequisite:* Geology 4101, Chemistry 3105, Math 4111.
- 4217 Petrology Spring Semester (3-3)**
Hand specimen study and classification of igneous, metamorphic, and sedimentary rocks. *Prerequisite:* Geology 4216.
- 4220 Invertebrate Paleontology (3-3)**
A survey of the classification, paleoecology, and stratigraphic distribution of fossil invertebrates. *Prerequisite:* Geology 4102 or 3205.
- 3305 Rocks and Minerals for Earth Science Teachers (2-3)**
Hand specimen study of the common rock-forming minerals, gem, and ore minerals, and of igneous, metamorphic, and sedimentary rocks. *Prerequisite:* Geology 4101; or 3205, or permission of instructor. Not open to Geology majors.
- 3315 Oceanography (3-0) Fall Semester**
Introduction to submarine geology, physical and chemical oceanography, marine organisms, marine resources, shore processes, and methods of marine technology. *Prerequisite:* Geology 4101 or 3104.
- 3321 Geology for Engineers - Fall Semester (2-3)**
The principles of physical geology and their practical applications to civil engineering. *Prerequisite:* Junior standing in engineering or permission of instructor.
- 4323 Structural Geology (3-6)**
A study of the principles and theories of structural geology. Special attention is given to primary and secondary rock structures important for economic reasons. *Prerequisite:* Geology 4217 and Mathematics 4111 and Cartography 3208 or concurrently.
- 3324 Geochemical Prospecting Spring Semester (2-3)**
The application of geochemistry to the search for commercial mineral deposits. *Prerequisite:* Geology 4217 or permission of instructor.
- 3325 Sedimentation Fall Semester (2-3)**
Methods of study and interpretation of sediments, including grain size and statistical analysis. Consideration is given to the genesis and classification of sedimentary rocks through field observation and laboratory study of hand specimens. *Prerequisite:* Geology 4217 or permission of instructor.
- 3327 Geological Microscopy Fall Semester (2-3)**
The optical theory of the interaction of light and minerals and the study of minerals and ores in grains, polished sections, and thin sections with the petrographic and ore microscopes. *Prerequisite:* Geology 4217; Physics 4104 or 4216 and/or permission of instructor.
- 3328 Morphology of Fossil Invertebrates (3-3) Spring Semester**
A study of the functional morphology, taxonomy, phylogeny, and biometry of the fossil invertebrates. *Prerequisite:* Geology 4220 or permission.

- 3330 Introduction to Micropaleontology (3-3)**
Techniques of collecting and preparation. Morphology, classification, biostratigraphic distribution, and paleoecology of animal microfossils. *Prerequisite:* Geology 4104-02 or Zoology 4103.
- 3359 Mineral Resources (2-3) Fall Semester**
Geology and distribution of mineral resources, present and future supplies, and conservation. *Prerequisite:* Geology 3103-04 or 3205 or 4101.
- 3405 Earth Science Field Course Fall Semester (2-4)**
Field observation; use of the field as a laboratory; methods and techniques of constructing maps and cross-sections, collecting and preparation of fossils, rocks, and minerals. *Prerequisite:* Geology 3305 or permission of instructor. Not open to Geology majors.
- 3420 Paleobotany (2-3) Fall Semester**
A study of the morphology, ecology, classification, development, and geological significance of fossil plants. *Prerequisite:* Geology 4220 or Botany 4103 and permission.
- 3421 Environmental Geology (3-0)**
A study of the applications of the science of geology to the problems of urban development and environmental control. *Prerequisite:* Geology 4101 or 3305 or 3321. Geology 1422 may be taken concurrently with this course.
- 1422 Quantitative Aspects of Environment (0-3)**
A laboratory course in which specific geological environmental problems are treated, both in the field and in the laboratory. Optional supplement for Geology 3421 and must be taken simultaneously. Fall Semester.
- 3425 Paleophycology (2-3) Spring Semester - Alternate years**
A study of the taxonomy, morphology, paleoecology, and stratigraphic distribution of fossil algae. *Prerequisite:* Geology 4220 or Botany 3210 and permission.
- 3430 Advanced Micropaleontology (3-3)**
A study of foraminifera, fossil and living ecology, systematics, and biostratigraphic usefulness are emphasized. *Prerequisite:* Geology 3330 or permission.
- 3440 Igneous and Metamorphic Petrology Spring Semester
Alternate years (2-3)**
The study of the origin, mineralogy, texture, and mode of occurrence, by thin section study, of igneous and metamorphic rocks. *Prerequisite:* Geology 3327.
- 3455 Vertebrate Paleontology Fall Semester - Alternate years (2-3)**
Study of the evolution, biologic history and classification of the vertebrates, with emphasis on the practical use of vertebrate fossils in the solution of stratigraphic problems. *Prerequisite:* Geology 4101-02 or Zoology 4103, senior standing or permission of instructor.
- 4458 Geology Applied to Petroleum (3-6)**
A study of the origin, nature, migration, and accumulation of petroleum. Special emphasis is placed on the economics of commercial deposits of oil and gas, and on specific techniques for studying rocks and structures beneath the earth's surface. *Prerequisite:* Geology 3462.
- 3462 Stratigraphy - Spring Semester (3-0)**
A study of the fundamental principles of stratigraphy with special emphasis on the stratigraphy of Southwestern United States and Northern Mexico. *Prerequisite:* Geology 4220 and/or permission of instructor.
- 3464 The Geology of Groundwater - Spring Semester - Alternate years (3-0)**
Study of the geology and hydrology of groundwater; occurrences, movements, fluctuations, and production; with emphasis on the groundwater resources of the Southwest. *Prerequisite:* 3323, 3325, or permission of instructor.

6465 Field Geology (Summer Field Course) (\$60)

A six-week summer course in field geology. The work will include preparation of topographic and geologic maps, cross-sections, columnar sections, and detailed structural studies of areas embracing both sedimentary and igneous rocks, plane table and aerial photo mapping techniques will be used. A report will be required of each student. Five hours of lecture and thirty-two hours of field work per week. *Prerequisite:* Geology 4216-17, 4220, 4323, and permission of instructor.

1466-3466 Special Problems

Special problem in geology; hours and subjects to be arranged with each student; for undergraduate students of senior standing who wish to do special work on special problems. No student may receive credit for more than six hours of special problem work. *Prerequisite:* Permission of Head of Department.

3470 Economic Mineral Deposits (3-3) Spring Semester

Study of the origin, nature, occurrence, and uses of economic industrial and metallic mineral deposits; prospecting and exploration techniques and economic factors are included. *Prerequisite:* Geology 4323 or permission.

3471 Advanced General Geology (3-3) Fall Semester

Comprehensive review of the fundamental principles of geology. *Prerequisite:* Senior Standing in geology or permission.

3472 Computer Applications in the Natural Sciences (1-6)

Study of computer applications in the natural sciences utilizing Fortran IV. Methods of preparation of data and statistical analysis will be stressed. *Prerequisite:* Junior standing or permission of the instructor.

FOR GRADUATE STUDENTS ONLY

1501 Technical Session (1-0)

Required of all graduate students. Discussion of various geological topics by the faculty, graduate students, and speakers from industry and other institutions. May be repeated for credit. *Prerequisite:* Senior or graduate standing.

3510 Advanced Invertebrate Paleontology (2-3)

A comprehensive analysis of the faunal taxonomy and paleoecology of the geologic systems. Professional methods of collecting and preparing invertebrate fossils will be stressed. *Prerequisite:* Geology 4220 and 4328, or permission.

3520 Paleozoic Biostratigraphy - Fall Semester - Alternate years (2-3)

Classification, paleogeography, and paleontology of the stratigraphic units within the Paleozoic systems. *Prerequisite:* Geology 4220.

**3525 Mesozoic and Cenozoic Biostratigraphy - Spring Semester
Alternate years (2-3)**

Classification, paleogeography and paleontology of the stratigraphic units of the marine Mesozoic and Cenozoic. *Prerequisite:* Geology 4220 and consent of instructor.

**3540 Petrography of Sedimentary Rocks - Spring Semester
Alternate years (2-3)**

Thin-section and hand-specimen study of sedimentary rocks, with emphasis on paleogeographic, tectonic, and environmental interpretation. *Prerequisite:* Geology 3325 and 3327.

**3550 Stratigraphy of Nonmarine Cenozoic Rocks - Spring Semester
Alternate years (3-0)**

History, stratigraphy, paleontology, and correlation of nonmarine Cenozoic of western North America. *Prerequisite:* Geology 3455 and permission of instructor.

3560 Advanced Physical Geology - Fall Semester - Alternate years (3-0)

Prerequisite: Senior or graduate standing and consent of instructor.

3561 Advanced Historical Geology - Spring Semester - Alternate years (3-0)

Prerequisite: Senior or graduate standing and consent of instructor.

- 3562 Special Problems in Geology**
Prerequisite: Graduate standing and consent of instructor.
- 3570 Advanced Structure and Geotectonics (3-0)**
Extensive reading on selected topics in structural geology, and broad review of the major principles and theories of geotectonics. *Prerequisite:* 4323 and permission.
- 3574 Mineral Economics - Fall Semester - Alternate years (3-0)**
Economic characteristics of mineral resources; economic analyses as applied to the mineral industries; problems related to mineral organization and financing. *Prerequisite:* Graduate standing and consent of instructor.
- 3576 Applied Geochemistry (2-3)**
Application of geochemical principles and techniques to prospecting for commercial mineral deposits. *Prerequisite:* Geology 3324 or permission.
- 3580 X-ray Mineralogy - Fall Semester - Alternate years (2-3)**
Theory and application of single, crystal and powder diffraction X-ray methods and crystal chemistry of rock-forming silicates and ores. *Prerequisite:* Senior or graduate and/or consent of instructor.
- 3585 Development of Geological Concepts (3-0)**
Study of the growth of the fundamental philosophical structure of the earth sciences from original sources, and the influence of these principles on modern geological thinking. *Prerequisite:* Graduate standing and permission of instructor (replaces 2585).
- 3590 Seminar in Geology (3-0)**
Seminar sections (non-concurrently) in paleontology and stratigraphy; mineralogy, petrology, and geochemistry; structural geology and geomorphology; economic geology, and subsurface correlation. (replaces Geology 2490) *Prerequisite:* Graduate standing and permission.
- 3591 Economic Geology: Industrial Rocks and Mineral Deposits (3-0)**
Study of the geologic and economic factors and techniques involved in finding, evaluating, producing, and marketing industrial rocks and minerals. *Prerequisite:* Geology 3470 or permission.
- 3592 Economic Geology: Metallic Mineral Deposits (3-0)**
Study of the geologic and economic factors and techniques involved in finding, evaluating, producing, and marketing metallic minerals. *Prerequisite:* Geology 3470 or permission.
- 3595 Petrology of Carbonate Rocks**
Description and classification of carbonate rocks; recrystallization, dolomitization, depositional environments; major groups of lime-secreting organisms; energy interpretations; diagenesis, and porosity formation. Two hours of lecture and three hours of laboratory work per week. *Prerequisite:* Geology 3325 and permission of instructor.
- 3596 Environmental/Engineering Geology: Theory (2-1)**
Advanced study of selected physical phenomena and rock properties of special importance to the planning, design, construction and operation of man's works. Analysis of the common problems encountered in the practice and predicting the influence of natural and man-made environmental factors. *Prerequisite:* Graduate standing and permission of instructor.
- 3597 Seminar in Environmental Geology (2-0)**
The geologic basis of man's environment and its significance in our modern technological society. Some principles of geological science are analyzed as to their interrelationship with other fields which influence man's environment. *Prerequisite:* Graduate standing and permission of instructor.
- 3598-99 Thesis Course for M.S. degree**
Prerequisite: Graduate standing and consent of staff.

GEOGRAPHY

Minor in Geography: Students may minor in Geography by taking 18 hours (six advanced) from the following list of courses: Geography 3106, 3110, 3207, 3208, 3210, 4206, 4306, 3312, 3407, 4410, and Geology 3315 and 3359.

For Undergraduates

General prerequisites: Junior standing for all 3300 and 3400 level courses.

3106 Physical Geography (2-2)

Survey of the physical elements of the earth, with emphasis on maps, climate, landforms, soils, and vegetation.

3110 Cultural Geography (3-0)

Introduction to cultural elements, their spatial distribution, and their interrelationship to the physical environment.

3207 Economic Geography (2-2)

Study of the physical and economic factors affecting the distribution and interrelationship of world resources and commodity production. *Prerequisite:* Geography 3106, 3110, or permission of instructor.

3208 Cartography (2-4)

Theory and construction of map projections, compilation procedures, principles of generalization and symbolization, cartographic drafting and lettering techniques, and map reproduction methods.

3210 Geomorphology (2-2)

Qualitative and quantitative analysis of geomorphic processes generated by water, ice and wind, with special reference to their effect in North America. *Prerequisite:* Geology 3103 or 4101, 3205, or Geography 3106.

4206 Weather and Climate (3-3)

Study of the components of weather, weather processes, and measurement; climatic elements and control factors; geographic classification of climatic and natural vegetation on the earth's surface. *Prerequisite:* Geography 3106, or Geology 3103 or 4101, or permission of instructor.

4306 Geography of Arid Lands (3-3)

A study of the physical complexes of the world's dry regions. Salient factors emphasized include climate, landforms, water, soils, natural vegetation and the various aspects of human occupation. *Prerequisite:* Geography 3106, 3207 or permission of instructor.

3312 Geography of Latin America (3-0)

Study of the physical and cultural features which characterize the economic, social, and political geography of Latin America. *Prerequisite:* Geography 3106, 3110, or permission of instructor.

3407 Arid Lands, Seminar (3-0)

Topics will be selected. Emphasis will be placed on field study. *Prerequisite:* Geography 4306 or permission of instructor.

4410 Advanced Geomorphology (3-3)

Quantitative and theoretical geomorphology along the lines of current research on hydraulic geometry of rivers, statistical laws of channel networks, and evolution of slopes and drainage basins. *Prerequisite:* Geography 2210.

MATHEMATICS

CARL E. HALL, *Chairman*

Professors BOYER, LEAHEY; *Visiting Professor* HEAD; *Associate Professors* BENTZ, GLADMAN, HALL, NYMANN, STRAUSS; *Assistant Professors* BAILEY, DODGE, FITZPATRICK, FOX, GRAY, HUNTLEY, KENNEL, KRUSCHWITZ, LIGUORI, LOPP, MARTIN-WILLIAMS, MICULKA, NARVARTE, PHILIPPOU, PROVENCIO, PRYOR, SCHUSTER, SRINIVASAN, WAGNER; *Instructors* HANSEN, McDONALD.

MATHEMATICS

Undergraduate Degree Requirements:

B.A. 3325, 3341 plus three advanced courses to include at least two of the following: Topology, Geometry, Probability, Number Theory, Set Theory, Mathematical Statistics.

B.S. Seven advanced courses to include 3325, 3341, 3441, and either 3333 and 3425, or 3323 and 3480.

(Only one of the courses Math 3333 and Math 3323 will be counted towards the major requirement.)

Students desiring to obtain a minor in statistics or a master's degree in mathematics with emphasis in probability and statistics should consult with the Chairman of the Department.

For Undergraduates

3101 Introductory Mathematics (3-0)

An introductory course designed to fit the needs of the liberal arts students. The objective is to give some understanding of the nature of mathematics. In particular the creative aspect is emphasized. Topics are chosen from such fields as combinatorics, probability, statistics, and number theory.

3102 Introductory Mathematics (3-0)

A continuation of Mathematics 3101. *Prerequisite:* Mathematics 3101.

3120 Introductory Mathematics for Business and Social Sciences (3-0)

The topics covered include the study of linear equations and inequalities in several variables, linear programming including the Simplex Method of optimization, introduction to vectors and matrices, and logarithms. *Prerequisite:* Three units of high school mathematics or the completion of three credit hours of university mathematics.

3124 Introduction to Computer Programming (3-1)

Through learning an elementary compiler language (such as BASIC), the student becomes acquainted with the design and organization of computers, with various algorithms, and with a logical approach to problem analysis. Open to all students.

4110 Pre-Calculus (4-0)

The course deals with the elementary mathematics necessary for a successful study of calculus. It includes a review of number systems and basic arithmetic operations; the elements of analytic geometry and trigonometry; polynomials; systems of linear equations; the definition of a function and the logarithmic and exponential functions; induction and the binomial theorem. *Prerequisite:* Two units of high school algebra and one unit of high school geometry.

4111 Calculus (4-0)

Topics include limits, continuity, differentiation, and integration of functions of a single variable; parametric equations. *Prerequisites:* Four units of high school mathematics and a SAT score of at least 600, or Math 4110, or departmental approval based on placement test.

School of Science

- 3212 Calculus (3-0)**
Continuation of Math 4111. Topics include solid analytic geometry, vectors, coordinate systems, special methods of integration and applications. *Prerequisite:* Math 4111.
- 3217 Calculus (3-0)**
Infinite series, partial differentiation, and multiple integrals. *Prerequisite:* Math 3212.
- 3201 Introductory Analysis for Business or Social Sciences (3-0)**
A study of selected topics of special interest to students of business or social sciences. The course includes an introduction to the calculus. *Pre.:* Math 3120 or its equivalent. Not counted for credit in addition to Mathematics 4111.
- 3302 Mathematics for Elementary Education (3-0)**
A study of the structure of the real number system and its subsystems, emphasizing concepts usually taught in elementary school. Topics include set theory, numeration, counting numbers, integers, rational and real numbers, decimal representation, and elementary number theory. The notions of group, ring, and field are presented. *Prerequisite:* Current registration in elementary education and junior standing. May not be counted as part of the advanced hour requirement for a major or minor for the B.A. or B.S. degree in Mathematics.
- 3303 Mathematics for Elementary Education (3-0)**
A continuation of Math 3302. *Prerequisite:* Math 3302.
- 3304 Mathematics for Elementary Education (3-0)**
The course consists of a review of set theory, an axiomatic development of geometric ideas, an introduction to the abstract notion of distance followed by a presentation of Euclidean and non-Euclidean geometry. *Prerequisite:* Math 3303.
- 3319 Elementary Number Theory (3-0)**
An introduction to some of the classical topics in number theory including divisibility, congruences, quadratic reciprocity, Diophantine equations and the distribution of primes. *Prerequisite:* Math 3212.
- 3323 Linear Algebra (3-0)**
An introduction to the algebra of vectors and matrices, and to linear transformations on vector spaces. The course is oriented towards applications and is primarily intended for the engineer and scientist. *Prerequisite:* Mathematics 3212.
- 3324 Computer Programming and Computer Principles (3-1)**
Includes a detailed study of Fortran IV together with applications to selected numerical methods. Because the language studied is relatively sophisticated and is presented as a tool to solve numerical problems, this course is more advanced and specialized than Math 3124. *Prerequisite:* Math 3212.
- 3325 Introduction to Algebra (3-0)**
Set Theory. Introduction to groups, rings, fields, and their elementary properties. *Pre.:* Math 3212.
- 3326 Differential Equations (3-0)**
A study of first order equations, linear equations with constant coefficients, general linear equations, the method of variation of parameters, the Laplace transform, and power series solutions. *Prerequisite:* Mathematics 3217.
- 3328 Set Theory (3-0)**
A study of set theory including cardinal and ordinal numbers together with a detailed development of the natural, rational, and real number systems starting with Peano's postulates. *Prerequisite:* Math 3212.
- 3333 Vector Spaces (3-0)**
Algebraic properties of vector spaces and linear transformations. *Pre.:* Math 3325.
- 3335 Higher Mathematics for Engineers and Physicists (3-0)**
Line and surface integrals, change of variable in multiple integrals, vector analysis and an introduction to complex variables. *Prerequisite:* Mathematics 3217.
- 3341 Introduction to Analysis**
Topology of the real line. Convergence. Continuity. The Integral. *Pre.:* Math 3217 and 3325.

- 3422 Modern College Geometry (3-0)**
A course in modern plane geometry involving an extension of some of the material of elementary geometry, together with an introduction to projective geometry. Properties of the triangle, properties of the circle, similitude, inversion, cross ratio, and principle of duality. *Prerequisite:* Mathematics 3325.
- 3425 Modern Algebra (3-0)**
Groups, rings, integral domains, and fields. *Prerequisite:* Mathematics 3325 and (or concurrent enrollment in) 3333.
- 3426 Modern Algebra (3-0)**
Continuation of Mathematics 3425. *Prerequisite:* Mathematics 3425.
- 3429 Numerical Analysis (3-1)**
Numerical techniques and the mathematics of computation, including linear difference equations, interpolation and the numerical solution of differential equations. Illustrative problems will be programmed in Fortran for solution on a high speed computer. *Prerequisite:* Math 3217, basic knowledge of Fortran, or consent of the instructor.
- 3431 Introduction to Point Set Topology (3-0)**
Topological spaces, continuous mappings, homeomorphisms and topological properties. *Prerequisite:* Mathematics 3341.
- 3436 Higher Mathematics for Engineers and Physicists (3-0)**
Series solutions of differential equations, Fourier Series and Fourier integrals, Bessel's equation and Bessel Functions, Legendre's equation and Legendre's polynomials, the Sturm-Liouville theorem and eigenfunction expansions, and an introduction to partial differential equations. *Prerequisite:* Mathematics 3326.
- 3437 Introduction to Complex Variables (3-0)**
The definition of the elementary analytic functions, differentiation, integration, Taylor series, and an introduction to conformal mapping. *Prerequisite:* Mathematics 3341 or 3335.
- 3441 Introduction to Real Functions (3-0)**
A detailed treatment of calculus. Topics include a study of real numbers, elementary topology in \mathbb{R}^n , sequences, limits, properties of continuous functions and the development of the Riemann integral. *Prerequisite:* Math 3341.
- 3442 Introduction to Real Functions (3-0)**
A continuation of Math 3441. Topics include series, uniform convergence, partial differentiation, Jacobians, and the implicit and inverse function theorems. *Prerequisite:* Math 3441.
- 3443 Ordinary Differential Equations (3-0)**
An introductory course in the theory of ordinary differential equations. Linear systems of equations. Existence, uniqueness, and dependence of solutions on initial conditions. Singularities of second order equations. Series Solutions. Topics from boundary value problems and stability theory as time permits. *Prerequisite:* Mathematics 3323 or 3333 or consent of instructor.
- 1499-3499 Individual Studies in Mathematics**
Studies of topics not included in or going beyond the regular course offerings. Pre.: Students must make arrangements with the Chairman, Department of Mathematics, prior to enrolling. May be repeated for credit. Not to be counted towards Major requirement.

STATISTICS

Minor in Statistics: Students may minor in Statistics by taking 18 hours (six advanced) as follows: Mathematics 3124 or 3324, 3201 or 4111, plus 12 units from Statistics 3280, 3281, 3330, 3380, 3480, 3481. Students who plan to pursue graduate studies in statistics related areas are urged to take Statistics 3480 and 3481.

For Undergraduates

- 3280 Introduction to Statistics I (3-0)**
A study of the principles and methods of statistics without calculus. Statistical description, probability concepts, random variables and probability distributions, special probability distributions, sampling distributions, estimation and confidence intervals. Concurrent enrollment in Statistics 1282 is optional.

- 3281 Introduction to Statistics II (3-0)**
A study of the principles and methods of statistics without calculus; hypotheses testing, nonparametric tests, analysis of variance, regression and correlation. *Prerequisite:* Statistics 3280. Concurrent enrollment in Statistics 1283 is optional.
- 1282 Computing Laboratory for Statistics 3280 (1-1)**
Practical exercises in the handling of statistical data and experimental sampling as related to the course work in Statistics 3280. Includes an introduction to data processing.
- 1283 Computing Laboratory for Statistics 3281 (1-1)**
Practical exercises in the handling of statistical data as related to the course work in Statistics 3281.
- 3330 Probability (3-0)**
This is an introductory course in the theory of probability. The ideas of sample space and probability and the axioms of probability theory are introduced through familiar finite examples. The standard notions of the theory are presented: conditional probability, random variables, distribution functions, expectation, mean, variance, etc. The central limit theorem, the law of large numbers and other limit theorems are included. *Prerequisite:* Math 4111 or 3201.
- 3380 Sampling Techniques (3-0)**
An account of sampling theory with practical applications; the role of sampling theory, simple random sampling, sampling for proportions, the estimation of sample size, stratified random sampling, systematic sampling. *Prerequisite:* Statistics 3281 or Statistics 3330.
- 3480 Introduction to Mathematical Statistics I (3-0)**
A mathematical study of the principles and methods of statistics at the introductory level; axiomatic definition of probability, marginal and conditional probabilities, random variables and random vectors, probability distributions and probability density functions, expectation and moments, moment generating functions, law of large numbers and central limit theorem, estimation, confidence intervals, introduction to hypotheses testing. *Prerequisite:* Statistics 3330 and Mathematics 3217, or consent of the instructor.
- 3481 Introduction to Mathematical Statistics II (3-0)**
A mathematical study of the principles and methods of statistics at the introductory level; hypotheses testing, least squares estimates, analysis of variance, nonparametric techniques. *Prerequisite:* Statistics 3480.

FOR GRADUATE STUDENTS ONLY

- 3511 Applied Mathematics I (3-0)**
Spectral Theory of operators, distribution theory, perturbation theory, Green's functions. Applications to ordinary and partial differential equations, integral equations and calculus of variations. *Prerequisite:* Mathematics 3335 and 3436 or the equivalent as approved by the instructor.
- 3512 Applied Mathematics II (3-0)**
A continuation of Mathematics 3511. *Prerequisite:* Mathematics 3511 or its equivalent as approved by the instructor.
- 3521 Advanced Abstract Algebra I (3-0)**
Groups, rings, fields, modules, with an introduction to homological methods. *Prerequisite:* Mathematics 3425 or its equivalent as approved by the instructor.
- 3522 Advanced Abstract Algebra II (3-0)**
A continuation of Mathematics 3521. *Prerequisite:* Mathematics 3521 or its equivalent as approved by the instructor.
- 3531 Real Variables I (3-0)**
Measurable sets and functions, Lebesgue-Stieltjes integration, Baire categories, L_p spaces and various types of convergence. *Prerequisite:* Mathematics 3441 or its equivalent as approved by the instructor.

- 3532 Real Variables II (3-0)**
A continuation of Mathematics 3531. *Prerequisite:* Mathematics 3531 or its equivalent as approved by the instructor.
- 3541 Topology I (3-0)**
A study of topological spaces, uniform spaces and function spaces, with an introduction to algebraic topology. *Prerequisite:* Mathematics 3431 or its equivalent as approved by the instructor.
- 3542 Topology II (3-0)**
A continuation of Mathematics 3541. *Prerequisite:* Mathematics 3541 or its equivalent as approved by the instructor.
- 3551 Complex Variables (3-0)**
Analytic continuation, Riemann surfaces, Riemann mapping theorem, infinite series and products representations of meromorphic functions, elliptic functions. *Prerequisite:* Mathematics 3437 and 3441.
- 3562 Functional Analysis (3-0)**
First course in normed linear spaces and linear operators, with brief introduction to linear topological spaces. Some applications to classical analysis. *Prerequisite:* Math 3532 or consent of instructor.
- 3570 Seminar (3-0)**
Various topics not included in regular courses will be discussed. May be repeated once for credit as the content changes. *Prerequisite:* Consent of instructor.
- 3580 Mathematical Statistics I (3-0)**
A thorough mathematical study of the principles and methods of statistics. Probability spaces, random variables and random vectors, probability distributions, expectation and moments, characteristic functions, moment generating functions and probability generating functions, derived distributions of random variables, law of large numbers and central limit theorem, order statistics, principles and methods of estimation. *Prerequisite:* Consent of the instructor.
- 3581 Mathematical Statistics II (3-0)**
A thorough mathematical study of the principles and methods of statistics; hypotheses testing, likelihood ratio and chi-square tests, sequential analysis, multivariate analysis, quadratic forms, least squares and the general linear model, analysis of variance, nonparametric techniques. *Prerequisite:* Mathematics 3580.
- 3582 Probability Theory I (3-0)**
A mathematical study of the notions of probability spaces, measurable functions and random variables, modes of convergence and limit theorems. *Prerequisite:* Consent of the instructor.
- 3583 Probability Theory II (3-0)**
A mathematical study of central limit theorems for sequences of independent and dependent random variables; multivariate limit theorems, conditional expectation and martingale theory; introduction to the theory of stochastic processes, in particular, Brownian motion. *Prerequisite:* Mathematics 3582.
- 3584 Statistical Principles in Experimental Design (3-0)**
The basic principles of the design and analysis of experiments which occur in all areas of experimental work. The computer will be used in the analysis of the data. *Prerequisite:* Consent of the instructor.
- 3586 Stochastic Processes I (3-0)**
A study of the theory and applications of stochastic processes. The role of stochastic processes, elements of stochastic processes, Markov chains, limit theorems, Poisson processes. *Prerequisite:* Consent of the instructor.
- 3587 Stochastic Processes II (3-0)**
A study of the theory and applications of stochastic processes; birth and death processes, renewal processes, Brownian motion, branching processes, queueing processes. *Prerequisite:* Mathematics 3586.
- 3589 Special Topics in Statistics (3-0)**
Various topics in probability and statistics not included in the regular courses will be discussed. May be repeated once for credit as the content changes. *Prerequisite:* Consent of the instructor.
- 3598-99 Thesis Course for the Master's Degree**

PHYSICS

DONALD E. BOWEN, *Chairman*

Professor Emeritus EDWIN J. KNAPP;

Professors BARNES, BOLEN, BOWEN, COOK, MCINTYRE, McMAHAN;

Associate Professors BLUE, BRIENT, BRUCE, DEAN, LAWSON, SCHUMAKER;

Assistant Professors COOPER, SLUSHER.

Departmental Requirements:

The Department of Physics offers a program of courses which can lead to the fulfillment of the requirements for the degree of Bachelor of Arts, Bachelor of Science in the Sciences, and Master of Science. The Master's Degree Program is described in the U. T. El Paso Graduate School Bulletin.

For the Bachelor of Science degree in Physics the student is required to complete satisfactorily the following thirty-six (36) semester hours of Physics: 1120, 3120, 1121, 3221, 3222, 3325, 2343, 3326, 3351, 3431, 3441, 2446, 3453, 3457, and Electrical Engineering 4278.

For the Bachelor of Arts degree in Physics the student is required to complete satisfactorily the following twenty-seven (27) semester hours of Physics: 1120, 3120, 1121, 3221, 3222, 3325, 2343, 3326, 3351, 3441, 2446.

All Bachelor of Science degree students are required to take the Graduate Record Examination (both Aptitude and Advanced) during their senior year.

All undergraduate physics majors are required to consult with and have their registration forms signed by the undergraduate advisor in the Physics Department each semester before registering.

General prerequisite: Junior standing for all 3300 or 3400 level courses.

3101 Principles of Physical Science — Both Semesters (2-2)

Designed to introduce as clearly and simply as possible the concepts of physical science to the liberal arts students, and especially those students with a limited background in mathematics. Emphasis is strongly placed on principles and the discovery of these by means of the laboratory. Attention is focused on the study of solid matter. May not be counted as physics toward a major or minor in physics or as a prerequisite to any physics course other than Physics 3102, but may be counted as a laboratory science in the liberal arts curriculum and the teaching field requirement in Education program. Open to all students.

3102 Principles of Physical Science — Both Semesters (2-2)

Continuation of Physics 3101. *Prerequisite:* Physics 3101. May not be counted as physics toward a major or minor in physics or as a prerequisite to any other course in physics, but may be counted as a laboratory science in the liberal arts curriculum and the teaching field requirement in Education programs.

4103 General Physics (3-2)

Mechanics and heat. May not be counted as physics toward a major or minor in physics. May be counted as a laboratory science in the liberal arts curriculum and the teaching field requirement in Education programs.

4104 General Physics (3-2)

Electricity, magnetism, sound, and light. May not be counted as physics toward a major or minor in physics. May be counted as a laboratory science in the liberal arts curriculum and the teaching field requirement in Education programs.

- 3106 Elementary Theory of Sound — Spring Semester (3-0)**
A study of sound as related to speaking, singing, and to musical instruments. It includes physical principles of sound production, transmission, interference, hearing, resonance, pitch, quality, musical intervals, stringed instruments, wind instruments, acoustics of rooms, and associated electronic equipment. May not be counted as physics toward a major or minor in physics or as a prerequisite to any course in physics.
- 4107 Elementary Astronomy — Both Semesters (3-2)**
A survey of the solar system. The main ideas of physical science in their relation to the universe. Topics covered are the earth, moon, planets, minor planets, comets, and meteors. The mathematical level is the same as in a freshman physics course. May not be counted as physics toward the major or minor in physics or as a prerequisite to any physics course but may be counted as a laboratory science in the liberal arts curriculum and the teaching field requirement in Education programs.
- 4108 Elementary Astronomy — Both Semesters (3-2)**
A continuation of Astronomy 4107. The sun, stellar properties, binary and variable stars, star cluster, and galaxies. *Prerequisite:* Astronomy 4107. May not be counted as physics toward the major or minor in physics or as a prerequisite to any physics course but may be counted as a laboratory science in the liberal arts curriculum and the teaching field requirement in Education programs.
- 1120 Physics Laboratory I (0-3) (Formerly Physics 1101)**
Basic laboratory techniques; elementary error analysis and curve fitting of experimental measurements.
- 3120 Mechanics (3-0) (Formerly Physics 3115)**
Vector kinematics, dynamics of particles and dynamics of rigid bodies. *Prerequisite:* Math 4111 and Physics 1120 or concurrently.
- 1121 Physics Laboratory II (0-3) (Formerly Physics 1102)**
Continuation of Physics 1120. *Prerequisite:* Physics 1120 or equivalent as determined by instructor.
- 3221 Heat, Wave Motion, and Optics (3-0) (Formerly Physics 3217)**
Thermal properties of matter, kinetic theory of gases, mechanical wave, and physical and geometrical optics. *Prerequisite:* Physics 3120 or equivalent; Mathematics 3212 or concurrently.
- 3222 Electricity and Magnetism (3-0) (Formerly Physics 4216)**
Electric fields, magnetic fields, dc and ac-circuit theory, and Maxwell's equations. *Prerequisite:* Physics 3221 and 1121 or concurrently; Mathematics 3212 or concurrently.

For Undergraduates and Graduates

All of the following courses, except as noted, have the prerequisites of Physics 3210, 3221, 3222, or the equivalent and any other prerequisites shown in the description of the course.

- 3331 Contemporary Physics (3-0)**
A descriptive course of contemporary physics topics. Designed for students in elementary and secondary education. May be counted toward the advanced hour teaching field requirement in Education programs. *Prerequisite:* six hours of Physics.
- 3333 Elementary Mathematical Physics (3-0)**
Elementary calculus techniques applied to general physics topics. May not be counted for advanced hour credit toward a major or minor in Physics if credit in Physics 3120 and Physics 3221 has been received. May be counted toward the advanced hour teaching field requirement in Education programs. The combination Physics 4103, 4104, and 3333 may be substituted for the combination Physics 3120 and 3221. *Prerequisite:* Physics 4104.
- 4320 Introduction to Geophysics — Fall Semester (3-3)**
A study of the application of the principles and practices of physics to the solution of problems related to the earth. It includes a study of geochronology, temperature of earth, seismology, dimensions of the earth, gravity, isostasy and tectonics, and geomagnetism.

- 4321 Introduction to Geophysics — Spring Semester (3-3)**
A study of geophysical prospecting. A general discussion of the methods of physics applied to exploration problems. Topics covered are seismic and gravimetric methods of prospecting.
- 3323 Physical Optics (3-0)**
Wave propagation, interference, diffraction, absorption, scattering, polarization, magneto- and electro-optics. Quantum Optics is introduced.
- 3325 Modern Physics I (3-0)**
Relativistic mechanics and quantum mechanical theory.
- 3326 Modern Physics II (3-0)**
Continuation of Physics 3325. Atomic and molecular structure, spectra, solid state physics, and nuclear physics. *Prerequisite:* Physics 3325.
- 4324 Applied Geophysics — Spring Semester (3-3)**
A study of geophysical prospecting with special emphasis on geomagnetism and nuclear geophysics. Includes theory and field work on the various magnetic and nuclear techniques.
- 3427 Theoretical Geophysics (3-0)**
A study of mechanical radiation and elasticity. A working knowledge and understanding of the fundamentals of geophysics is emphasized with special emphasis on problems in seismology. *Prerequisite:* Mathematics 3326 or 3436.
- 3428 Theoretical Geophysics (3-0)**
A study of the theory of potential. Emphasis is on the solving of various problems associated with the natural force fields of the earth. *Prerequisite:* Mathematics 3326. Not dependent on Physics 3427.
- 3359 Stellar Astrophysics (3-0)**
The physical basis for Stellar radiation, Stellar motions, binary and variable stars, Stellar interiors, and the formation of energy in stars, interstellar matter, galaxies, and cosmology. *Prerequisite:* Mathematics 3217.
- 3360 Solar System Astrophysics (3-0)**
The physical characteristics of the sun, the planets, their satellites, comets, meteorites, asteroids, and the interplanetary dust and gas. *Prerequisite:* Mathematics 3217.
- 3330 Applied Radiation Physics — Spring Semester (2-3)**
A study of the physics of ionizing radiation and its interaction with matter. An introduction to the effects of ionizing radiation, to exposure units and related calculations, to the use of instruments for measuring radiation, to the calibration of sources, to the use of isotopes, and to protective measures. *Prerequisite:* Physics 3325.
- 3431 Statistical and Thermal Physics — Fall Semester (3-0)**
An introduction to the behavior of macroscopic systems and to the microscopic basis for that behavior. *Prerequisites:* Physics 3351. Mathematics 3326 or concurrent.
- 3432 Statistical and Thermal Physics — Spring Semester (3-0)**
Continuation of Physics 3431. *Prerequisite:* Physics 3431.
- 4339 Electronics — Fall Semester (3-3)**
Physical electronics, transistors and other semiconductor elements. Also includes elementary equivalent circuits and circuit theory. *Prerequisite:* Either Physics 4104 or 3222.
- 4340 Electronic Systems — Spring Semester (3-3)**
Theory and applications of a wide variety of semiconductor circuits and systems, including digital systems. Also includes advanced analysis methods and recent developments in electronics. *Prerequisite:* Physics 4339.
- 2343 Advanced Laboratory Practice — Both Semesters (0-6)**
A course covering theory and practice in the measurement of electrical and magnetic quantities. Certain phases of modern physics are discussed and dealt with in the laboratory. The sensitive galvanometer is studied in detail. Attention is given to various types of bridges. Measurements are made of such quantities as the charge on the electron, the ratio of charge to mass, and other quantities related to modern physics. Electrical discharge through gases and attendant phenomena are also studied. May be repeated once for credit.

- 3351 Analytical Mechanics — Fall Semester (3-0)**
 A study of one-body, two-body, many-body, and rigid body problems utilizing the methods of Newtonian Mechanics. *Prerequisites:* Mathematics 3217 and Mathematics 3326 (or concurrently).
- 3352 Analytical Mechanics — Spring Semester (3-0)**
 A study of one-body, two-body, many-body, and rigid body problems via the Lagrangian and Lagrange's equations of motion; an introductory study of selected problems via the Hamiltonian and Hamilton's equations of motion; a study of the theory of small oscillations and an introductory study of energy transfer through continuous media. *Prerequisite:* Physics 3351.
- 3441 Electricity and Magnetism — Fall Semester (3-0)**
 Maxwell's field equations are postulated and conventional laws of electricity and magnetism are derived from electromagnetic theory. Applied techniques in circuit theory are introduced. Vector theory is developed in the course as needed. *Prerequisite:* Physics 3351, or equivalent as determined by the instructor. Mathematics 3335 is recommended.
- 3442 Electricity and Magnetism — Spring Semester (3-0)**
 Continuation of Physics 3341. Includes electromagnetic waves and radiation systems and Lorentz transformation of field vectors. Applications of electromagnetism to existing technology are included. *Prerequisite:* Physics 3441.
- 3445 Electromagnetic Waves and Radiating Systems (3-0)**
 Theory and operation of gas and solid state lasers (including junction lasers), masers and optical amplifiers; theory and design of optical resonant cavities; applications of lasers. *Prerequisite:* Physics 3326 or equivalent; Physics 3323 recommended.
- 2446 Senior Laboratory (Both Semesters) (0-6)**
 May be repeated once for credit. *Prerequisite:* Senior standing and Physics 2343.
- 3448 Fundamentals of Acoustics — Spring Semester (3-0)**
 The principles underlying the generation, transmission, and reception of acoustic waves. Mathematical analyses of the various types of vibration of solid bodies. Propagation of plane and spherical sound waves through fluids, transmission and absorption phenomena, resonators and filters. *Prerequisite:* Mathematics 3326 or 3436.
- 3453 Methods of Mathematical Physics (3-0)**
 Selected topics in Mathematical Physics. *Prerequisite:* Mathematics 3326 and Physics 3351.
- 3454 Methods of Mathematical Physics (3-0)**
 Continuation of Physics 3453. *Prerequisite:* Physics 3453.
- 3457 Introduction to Quantum Mechanics (3-0)**
 Boltzmann and quantum statistics, electron theory of metals, atomic interactions with radiation, the Hamiltonian and Schroedinger's equation, the square well, harmonic oscillator, hydrogen-like atoms, and the theory of transitions. *Prerequisite:* Physics 3326.
- 3458 Solid State Physics (3-0)**
 Theory of lattice vibrations and conduction, paramagnetism, and ferromagnetism. *Prerequisite:* Physics 3457.
- 3470 Atmospheric Physics — Fall Semester (3-0)**
 Considers the physical structure of the atmosphere as related to the Earth and near-space environment. The time and spatial distribution of its composition; the kinetic atmospheric, and electromagnetic parameters—all are presented in detail. The effects on man's operation in the atmosphere are discussed with emphasis on the relatively new factors presented by recent expansion into the new speed and space regime.

3471 Atmospheric Physical Process — Spring Semester (3-0)

The occurrence of energy transfer processes such as convection, advection, condensation, evaporation, ionization, radiation, and absorption are considered in relation to the over-all atmospheric physical structure. The development of ionized regions of the atmosphere, the state changes incident to the precipitation cycle, and the electrical environment in which these processes operate will be studied. Interaction between the Earth's surface, the troposphere, the stratosphere, and the ionosphere as well as the new space environment will be discussed. *Prerequisite:* Physics 3470.

3472 Stratospheric Circulation (3-0)

Background of the historical development of our knowledge of the structure of the stratosphere with particular attention to the development of the Meteorological Rocket Network. Rocket techniques, sensor systems and data acquisition and processing systems employed in MRN, climatological structure of the stratospheric circulation, and the changes which may be expected as a longer period of record is obtained will be considered. Gravitational influences on the solar heat disposition as well as the distribution of atmospheric absorbers and the dynamic factors which exert an influence on the global stratospheric circulation. *Prerequisite:* Physics 3470.

1475-6475 Workshop in the Teaching of Physics or Physical Science

May be repeated for credit upon change of subject. *Prerequisite:* Permission of instructor.

1476-3476 Undergraduate Seminar

Supervised individual seminars. May be repeated for credit as study topic changes. *Prerequisite:* Senior standing, a 3.0 grade point average and permission of the instructor. Coregistration in 1477-3477 is recommended.

1477-3477 Undergraduate Research Problems in Physics

Supervised individual research. May be repeated for credit as study topic changes. *Prerequisite:* Senior standing, a 3.0 grade point average and permission of the instructor. Coregistration in 1476-3476 is recommended.

FOR GRADUATE STUDENTS ONLY

The department offers a program of courses and research leading to the degree of Master of Science in Physics. Two routes may be taken. Plan 1 requires 24 hours of course work plus a 6-hour thesis. Plan 2 requires 36 hours of course work without a thesis.

Departmental requirements for plan 1 are 21 semester hours of graduate work at the 3500 level including the thesis, specific courses required are Physics 3521, 3541, and 3561.

Departmental requirements for a plan 2 are 27 semester hours of graduate work at the 3500 level, specific courses required are Physics 3521, 3541, 3561, and 3591.

An intrinsic property of graduate study is that programs of instruction are tailored to the individual needs and background preparation of the student. It may be appropriate for some students to supplement their course of study with courses selected from the undergraduate curriculum.

The following courses have the prerequisite of the equivalence of a B.S. degree in Physics from The University of Texas at El Paso and any other prerequisite shown in the description of the course.

3501 Principles of Geodynamics — Fall Semester (3-0)

An extensive mathematical and physical study of geodynamics. Study takes up the geophysical data regarding the earth, mechanics of deformations, effects of the rotation of the earth, orogenesis, dynamics of earthquakes, dynamics of volcanism, and related topics.

3502 Principles of Geodynamics — Spring Semester (3-0)

Continuation of Physics 3501. *Prerequisite:* Physics 3501.

- 3506 Physics of the Upper Atmosphere (3-0)**
Upper atmospheric circulation influences on photochemical equilibrium. State changes involving water vapor, ozone, oxides and ionized and neutral components of the atmosphere and their relation to formation and destruction processes and equilibrium conditions. Interactions between the gravitational, magnetic, flow and plasma fields. Sources, sinks and propagation characteristics relative to a spectrum of wave motions ranging from acoustic waves to diurnal tides. *Prerequisite:* Physics 3470 or equivalent as determined by the instructor.
- 3507 Atmospheric Turbulence and Diffusion (3-0)**
The physics of molecular and eddy diffusion. Transport processes in various regions of the atmosphere. The power source which drives the turbulent eddies and the impact eddy mixing on atmospheric structure are considered in detail.
- 3508 Atmospheric Electrodynamics (3-0)**
Study of the interaction between neutral and electrical components of the atmosphere, electrical structure in the 75-150 km altitude region, thermotidal circulations of the strato pause region, dynamo-current systems, and other geo-electrical effects of the atmosphere.
- 3511 Physics of Fluids (3-0)**
Dynamics of transport phenomena in fluids including theory of turbulence, boundary layer and surface phenomena, radiation transport, relativistic dynamics, and dynamics of superfluids.
- 3521 Mechanics — Fall Semester (3-0)**
D'Alembert's and variational principles, Lagrange's equations, Hamilton's principle, two-body central force, rigid body, kinetics and force equations, Lagrangian relativistic mechanics, principle of least action.
- 3522 Mechanics — Spring Semester (3-0)**
Hamilton's and Hamilton-Jacoby theory, small oscillations, continuous systems and fields. Poisson's and Lagrange brackets invariants, conservation theorems and symmetry. Relativistic mechanics. *Prerequisite:* Physics 3521.
- 3532 Plasma Physics — Fall Semester (3-0)**
Physics of fully ionized gases. Waves and instabilities. Transport properties. Interaction of charged particles with electromagnetic fields. *Prerequisite:* Physics 3432, 3541, or equivalent as determined by the instructor.
- 3533 Plasma Physics — Spring Semester (3-0)**
Continuation of Physics 3532. *Prerequisite:* Physics 3532.
- 3541 Electricity and Magnetism — Fall Semester (3-0)**
Boundary value problems: polarization, and stress tensor; Conservation laws and energy momentum-tensor. Relativistic electrodynamics. Covariant form of field equations. Potentials and gauge invariance.
- 3542 Electricity and Magnetism — Spring Semester (3-0)**
A continuation of Physics 3541. Multipole radiation, radiation damping, "Bremsstrahlung." Interference, diffraction and scattering. Special resolution, the Lagrangian to terms of second order, and other topics. *Prerequisite:* Physics 3541.
- 3550 Advanced Modern Physics — Spring Semester (3-0)**
Topics of Physics since 1900 supplementing the Atomic Spectra, Quantum Mechanics, and Nuclear Physics in other courses.
- 3551 Nuclear Physics — Fall Semester (3-0)**
Systematics of nuclei, binding energy, nuclear models, scattering of protons and neutrons, nuclear reactions, passage of charged particles and gamma rays through matter. *Prerequisite:* Physics 3457.
- 3552 Nuclear Physics — Spring Semester (3-0)**
Continuation of Physics 3551. *Prerequisite:* Physics 3551 and Physics 3561 or equivalent as determined by the instructor.
- 3554 Cosmic Radiation (3-0)**
Topics of Cosmic Radiation and high energy nuclear physics.
- 3561 Quantum Mechanics — Spring Semester (3-0)**
Solution of the Schroedinger wave equation for discrete and continuous energy eigenvalues; representation of physical variables as operators and the matrix formulation of quantum mechanics; approximation methods. *Prerequisite:* Physics 3457 and Mathematics 3323 recommended, or equivalent as determined by the instructor.

- 3562 Quantum Mechanics (3-0)**
Continuation of Physics 3561. Relativistic wave equations and quantization of fields. *Prerequisite:* Physics 3561.
- 3563 Quantum Field Theory — Fall Semester (3-0)**
Second quantization, non-relativistic theory, relativistic Fock space methods, Quantization of fields, Field interactions, Scattering theory, Field theory models, S-matrix, Feynman diagrams, Quantum electrodynamics, Renormalization theory. *Prerequisite:* Assumes knowledge of one-particle equations and Physics 3562.
- 3564 Quantum Field Theory — Spring Semester (3-0)**
Continuation of Physics 3563. *Prerequisite:* Physics 3563.
- 3565 Advanced Statistical Mechanics — Fall Semester (3-0)**
Classical and quantum statistics of systems in equilibrium. Treatment of fluctuations and transport phenomena. Introduction to many-body problems. *Prerequisite:* Physics 3457 or equivalent as determined by the instructor. Physics 3561 recommended.
- 3566 Advanced Statistical Mechanics — Spring Semester (3-0)**
Continuation of Physics 3565. Special emphasis on the Green's Function method of statistical mechanics. *Prerequisite:* Physics 3565 and 3563 or equivalent as determined by the instructor.
- 3567 Non-Equilibrium Statistical Mechanics (3-0)**
The Liouville equation, anharmonic solids, Brownian motion, weakly coupled gases, scattering theory, the diagram representation, general H-theory, irreversibility and invariants of motion. *Prerequisite:* Physics 3565.
- 3571 Solid State Physics — Fall Semester (3-0)**
Electromagnetic, elastic and particle waves in periodic lattices as applied to the electrical, magnetic and thermal properties of solids. *Prerequisite:* Physics 3457 and 3458 recommended.
- 3572 Quantum Theory of Matter — Spring Semester (3-0)**
Phonon, magnon, polaron and photons and their interactions in matter. Selected topics in super-conductivity, energy bands, cyclotron resonance, impurity state, optical absorption, and recoilless emission. *Prerequisite:* Physics 3571 and Physics 3562 or concurrently.
- 3580 Propagation in Neutral and Ionized Atmospheres (3-0)**
Plasma dynamics and the ionosphere, atmospheric electromagnetic wave propagation and both pulsed and continuous laser applications in the atmospheric sciences. *Prerequisite:* Mathematics 3326 and Electrical Engineering 4447 or equivalent. Same as Electrical Engineering 3580.
- 3591 Research Problems in Physics - Every Semester (3-0)**
Required course for the 36-hour non-thesis option. Requires two copies of a type-written report. May be repeated for credit; maximum credit allowed six hours. May not be counted as thesis research but may be taken one time as a preparatory investigation course prior to the beginning of thesis research. *Prerequisite:* Permission of Chairman of Committee on Graduate Studies of Physics Department.
- 1595 Graduate Seminar - Every Semester (1-0)**
May be repeated for credit up to a total of 3 semester hours.
- 3593 Special Topics in Physics**
Topics to be announced. May be repeated for credit.
- 3598 Thesis Course for the Master's Degree — Every Semester**
- 3599 Thesis Course for the Master's Degree — Every Semester**

§ DIVISION OF STUDENT AFFAIRS §

This division consists of the Student Affairs Office, the Student Counseling Service, the Financial Aid and Placement Office, the Student Activities Office, the Student Health Service, Student Publications, the International Student Services Office, the Admissions Office, the Registrar's Office, Housing and Food Service, The Union and the Freshman Services Office.

The University Counseling Service, located in the West wing of The Union and staffed by professional counselors is available for students, staff, and faculty seeking personal, vocational, study-skills, or academic counseling. The Human Resource Center, located on Oregon Street near University and "Connection" which is housed in the Human Resource Center, function as evening crisis-counseling and personal growth services for all members of the University Community. These services are staffed by para-professional counselors extensively trained and supervised by the University Counseling Service Staff. The Counseling Service also serves as a testing center administering interest and personality tests and a wide range of achievement tests such as the LSAT, SAT, GRE, CLEP, TOEFL, NTE, ATCSB, Miller Analogies, Dental Aptitude test, and Placement tests in Spanish, French, German, English, Biology and other subject matter areas.

The personnel in the Office of the Vice-President for Student Affairs are concerned with the welfare of the entire student body and all are available for the discussion of any problems the student may have.

Scholarships

The University of Texas at El Paso has an excellent Scholarship Program which is administered to attract and retain outstanding students and to reward academic excellence. These awards are made possible by the generosity of numerous business firms, civic organizations, professional groups, and individuals. Persons wishing to establish scholarships or contribute to the scholarship fund may secure information from the Assistant Dean of Students. The average amount of awards is \$200.00 per year although awards range up to \$1,250.00 per year.

To be considered for a Scholarship a high school applicant must have a "B" average. A student already enrolled must have completed at least 30 hours in residence in the two previous long semesters attended and possess a cumulative grade point average of "B" (3.0) to be eligible. All applicants must submit SAT scores. In order to retain a Scholarship, the recipient must have a "B" (3.0) cumulative grade point average at the end of the Fall Semester and complete at least 30 hours in the combined Fall and Spring Semesters. Recipients wishing to remain on Scholarship must complete a Renewal Form at the time the Spring award is received. All scholarship awards are made in the Spring Semester after March 1 and are usually for both semesters of the forthcoming school

year.

Scholarship Applications may be obtained from the Office of the Assistant Dean of Students or from High School Counselors. Applications will not be considered unless accompanied by a transcript of high school grades, and Scholastic Aptitude Test Scores. The deadline for application is March 1. Applications, high school transcripts, and SAT scores received after March 1 *can not* be accepted.

The University of Texas at El Paso is especially desirous of attracting students who show high academic promise. Advanced placement and credit, honors classes, and honorary organizations, have been instituted to challenge superior students and facilitate their achievement.

For further information write:

ASSISTANT DEAN OF STUDENTS
The Union 101W
The University of Texas at El Paso
El Paso, Texas 79968

Placement

The Placement Office, located in The Union, is available as a service to students. The main purpose of the Office is to assist students in finding employment based upon their ability, training and experience.

Employment by the University

Several hundred students are employed by the University in jobs ranging from semi-skilled laborers to student readers, research assistants, and laboratory and teaching assistants. The University participates in the Work-Study Program for employment of students with financial need. Payment is normally on an hourly basis, the rate depending upon the individual's knowledge and skills. Students work varying hours, in accordance with their academic loads and the requirements of their jobs.

Many husbands and wives of students have full-time jobs with the University, enabling their spouses to devote full attention to academic work during the period of university attendance.

Career Employment

All graduating seniors are encouraged to register with the Placement Office prior to graduation. Seniors should check with the Office during the Spring Semester of their Junior year in order to take advantage of the many opportunities available.

Each fall and spring, representatives from many companies both local and national visit the campus to interview seniors and graduate students. Many graduates are offered career positions with these companies.

Records of seniors are filed in the Placement Office and are made available to prospective employers upon request of the student.

Teacher Placement

Senior students majoring in education should register during the Spring Semester of their Junior year. These students are assisted in securing positions locally and throughout the country. The Placement Office receives many requests for teachers each year.

Many school districts recruit on the campus during the school year for teachers and any senior education major is eligible to sign up for an interview. Personnel records are maintained and upon request of the student a copy is furnished to the prospective employer.

Part-time Employment

Part-time jobs and summer employment are also a function of the Placement Office. Any student interested in obtaining part-time work or summer employment is encouraged to register with the Placement Office for assistance.

Co-op Program

Several Co-op Programs have been established with Government Agencies and industries. These Co-ops are for students majoring in Engineering, Physics, and Mathematics. Each student accepted for the program must have a "B" average or above in his high school work and must maintain a 2.5 or better grade point average to remain in the program once he is accepted. In most programs, each student works six months on the job and attends school for six months.

Information on the programs and applications may be obtained from the Placement Office.

Loans and Grants

Student loan and grant funds are administered by the Director of Financial Aid and Placement. Applicants are required to complete the Family Financial Statement and submit it to the American College Testing Program and have a personal interview. All loans are determined on the basis of financial need.

Long Term Loans

These loans are payable after graduation or after the borrower ceases to be a full-time student. Generally, an undergraduate student may borrow up to \$1,000 per year and a graduate \$1,500 depending on the availability of funds.

The National Direct Loan Program is jointly sponsored by the Federal Government and The University of Texas at El Paso. The National Direct Loan draws no interest until nine months after the borrower ceases to be a student. At this time, interest begins to accumulate at the rate of 3% per annum on the unpaid balance. The deadline for applying for NDEA loans is April 1 of each year.

Hinson-Hazlewood College Loan Program is operated by the State of Texas through the Coordinating Board, Texas College and University System. These loans are for Texas residents attending Texas schools. They are repayable within ten years after the student graduates or ceases to attend college. The first payment is due nine months after graduation or withdrawal.

The deadlines for applying for these loans are July 1st for Fall semester, November 1st for Spring semester, and March 1st for Summer loans.

The Federal Insured Loan Program is operated through commercial lending institutions such as banks, credit unions,

and savings and loan associations. The loans are guaranteed to the lending institution with reserve funds from the Federal Government. They are repayable within five years after the student graduates or ceases to attend college. The first payment is due nine months thereafter.

Emergency Loans

These loans in the sum of fifty dollars or less are payable within the semester in which the loan is granted and draw 4% simple interest. Only one loan can be made in a semester. It is suggested that interested students contact the Financial Aid Office.

Tuition Scholarship

The State Law provides that Texas residents who are not on scholastic probation and who can prove financial hardship may be awarded a \$25.00 Tuition Scholarship for each semester towards their tuition. It is required that a student must be a full-time student in order to secure this type scholarship. All Texas residents filing an application for financial assistance will be considered for one of these awards. It is not necessary to file a separate application as all students requesting Financial Aid will be considered.

Needy Scholarship/Grant

House Bill 43 enacted by the 43rd State Legislature provides for a needy scholarship to be awarded to students attending the University based on financial need and good standing. A student is considered for this financial aid on his general application.

Law Enforcement Loans and Grants

The Law Enforcement Loan is provided for students who intend to pursue, or resume, full-time employment with a Law Enforcement Agency.

The Grant Program is limited to in-service Law Enforcement Officers. The grants may not exceed \$300 a semester or the amount for mandatory fees, tuition and books.

College Work-Study Program

Under this federally sponsored program, students who qualify may work up to 15 hours weekly while attending classes full-time. During the summer or other vacation

periods when they are not attending classes, they may work full-time (40 hours) under the program. To work under this program during the academic year, a student must be enrolled full-time and be in good standing. For summer employment he must be either enrolled or accepted for enrollment at The University of Texas at El Paso.

Educational Opportunity Grants Program

The Educational Opportunity Grants Program, authorized by the Higher Education Act of 1965 and 1972 was established to assist students in extreme financial need who, without the grant, would be unable to attend college.

Grants ranging from \$200 to \$1,000 are made to students for each of the four years of undergraduate study. Colleges and Universities participating in this Program select the recipients and determine the individual need of the student.

Application for this grant is made to the Financial Aid Office and should be turned in no later than April 1st to receive consideration for the following school year. Applicants must be previously accepted for admission, or be enrolled and in good standing before applying for this grant.

Connally-Carrillo Act

In 1967 the 60th Texas Legislature passed Senate Bill 431 which established a program of financial assistance to Texas residents attending institutions of higher education in Texas.

To be eligible a student must be a citizen resident of Texas who is under 25 years of age and was graduated in the top 25% of their graduating class of an accredited high school in 1967 or thereafter; or was graduated by an accredited high school in 1967 or thereafter and scored in the top 20% on a nationally standardized college admission examination; and whose family income was not more than \$4,800 as indicated on their last income tax return or on a financial statement sworn to by the applicant's parents or guardian.

Amount of the award includes exemption and certain required fees.

Although there is no deadline for applying for this loan we prefer the student have his application in *approximately sixty days prior to registration.*

All inquiries regarding Financial Aid & Placement should be accompanied by a stamped self-addressed envelope and sent to:

Director
103-W The Union
Financial Aid & Placement
The University of Texas at El Paso
El Paso, Texas 79968

FRESHMAN SERVICES

A newly created Department which has a three-fold responsibility. High School and College Relations, Freshman and New Student Orientation and the administration of the Freshman Office. In essence, Freshman Services is committed to assisting entering freshmen from the first contact made with them during their senior year in High School to their sophomore year at The University.

High School and College Relations

The University in cooperation with the Texas Association of College Registrar and Admissions Officers (TACRAO) participates annually in the various College Day or Night Programs sponsored by High Schools throughout the state. Also, an intensive visitation of Junior Colleges over the state is carried on. Every attempt is made to contact interested students whether in High School or Junior College to provide information and assistance in enrolling at U.T. El Paso.

Freshman and New Student Orientation

Special programs of Orientation are provided for freshman and undergraduate transfer students to make their adjustment to The University as easy as possible. The Orientation Programs usually are scheduled immediately prior to the Spring or Summer terms. Students entering in the Fall will have the option of five or six orientation programs planned during the month of August. For additional information contact The Office of Freshman Services, The Union 209-W, or call 747-5524.

Freshman Office

This is a unique service provided for entering students at U.T. El Paso. It is planned as a "continuing orientation" throughout the year. The office provides "peer" counseling for students with the normal freshman problems or questions. It also conducts regular classes in Reading and Study Skills and makes available professional counseling in this area. Freshmen are encouraged to visit the office whenever a need or problem arises. The office is located in The Union, 108-w.

STUDENT ACTIVITIES *and* ORGANIZATIONS

STUDENT ASSOCIATION

The Student Association is the governmental structure through which the students participate in the planning, coordination, and execution of their activities. The basic framework of the "SA" resembles the pattern established by our national government. The Executive, Legislative and Judicial branches all function to provide a balanced program for the benefit of the students. All full-time students are automatically members of the Student Association and part-time students may become members by paying the "SA Fee" during registration.

ATHLETICS

Intercollegiate

A pair of NCAA team championships, numerous individual champions and two Sun Bowl victories are a few of the feats authored by The University of Texas at El Paso's athletic program in recent years.

A member of the Western Athletic Conference, the Miners have captured NCAA championships in basketball and cross country, several individuals have captured NCAA titles in track and baseball, and the football team has put together victories over TCU and Mississippi in the Sun Bowl Classic.

Such teams as Arizona State, Arizona, Wyoming, Utah, Brigham Young, New Mexico, Colorado State make football appearances at the Sun Bowl, a 30,000 seat plant located on campus. In recent years the basketball team has made appearances at Madison Square Garden, Chicago Stadium, and several NCAA tournaments. The overall athletic program affords students, staff and community residents a great deal of spectator enjoyment.

Intramurals

A wide range of activities for men and women are provided through the Intramural Program. The program is administered by the Intramural Director, the Assistant Director of Intramurals, and the Intramural Sports Committee. The five major sports are football, basketball, volleyball, softball, and pushball. Other activities range from handball to golf. Sororities, fraternities, residence halls and religious and independent organizations vie for the over-all team championship.

The Intramural Department sponsors many interest group clubs with membership open to all students. Some of the clubs are archery, badminton, 3-man basketball, bowling, field hockey, handball,

fencing, judo, karate, raquetball, rugby, soccer, swimming and diving, table-tennis, tennis, volleyball, water polo, weight lifting, wrestling, and CENTURY CLUB. Other clubs will be formed as student interest warrants.

Aggie-Miner Day takes place at the end of the Intramural season in May. It involves competition between U. T. El Paso Intramural Champions and the New Mexico State University Champions.

A banquet, Noche de Deportista (Sportsmen's Night), is the culminating event of the Intramural year. It is the highlight of the Intramural program and the speaker is usually a national sports personality. Special Awards presented include: Intramural Manager of the Year, Sportsmanship, Athlete of the Year, and the award given to the organization accumulating the highest number of points during the year.

THE UNION

The Union is the community center for all members of the University family—students, faculty and staff, alumni and guests. It is not just a building; it is also an organization and a program. Together they represent a well considered plan for the community life of the University.

The Union is a member of the Association of College Unions International (ACU-I).

The Union Committee

Composed of students, faculty, and administrators, The Union Committee advises on policies relating to the operation, administration, and use of The Union.

The Student Activities Board

The Union Council is the programming body of The Union. Its activities are carried out by six committees and an Executive Council.

The Union Council receives its funds from The Union allocation of the Building Use Fee. It sponsors the Coffeehouse Circuit, The University Forums, and the U. T. El Paso College Bowl besides dances and activities in The Union.

The objectives of The Union Council are: To contribute to the development of an intellectual climate on campus; to supplement classroom experiences with a variety of educational programs; to promote student initiative and leadership; to develop student loyalty and support for the University; and to provide wholesome leisure-time activities for students and faculty. Membership in the Union Council is open to all students.

ORGANIZATIONS

Other major participation areas include student publications, governmental organizations, four national sororities, ten national fraternities, music, drama and groups, and Political and departmental organizations. There are more than one hundred different groups from which a student may choose his activities. They are: *UTEP Accounting Club* — to promote accounting profession among students.

Alpha Chi—Scholastic honorary for Juniors and Seniors.

Alpha Debs — Social Service Organization.

Alpha Epsilon Rho — Honorary radio society.

Alpha Lambda Delta — National honorary society for freshmen women.

Alpha Phi Alpha — National Social Fraternity.

Alpha Phi Omega—Local social fraternity.

American Chemical Society — Collegiate branch of professional society.

American Institute of Mining, Metallurgical, and Petroleum Engineers—Collegiate branch of professional society.

American Society of Civil Engineers—Collegiate branch of professional society.

American Society of Mechanical Engineers — Collegiate branch of professional society.

Association for the Advancement of Education — to motivate and orient local high school students toward higher education.

Association of Counselors in Training — Professional Organization.

Baptist Student Union.

Black Student Union — Cultural — special interest.

Campus Crusade for Christ.

UTEP Cannoneers—to promote spirit with the touchdown gun.

Cardinal Key — Junior women honorary service organization.

Chi Gamma Iota — Veterans Club, Service and social organization.

Chi Omega — National social sorority.

Christian Science—A campus organization of Christian Science students and faculty members.

Circle K International—Men's service club.

Delta Delta Delta — National social sorority.

Delta Eta, Chapter of Gamma Sigma Sigma — Sorority.

Delta Iota — Mature woman student organization.

Delta Sigma Theta — Public service sorority.

Eta Kappa Nu — Honor Society — Electrical Engineering.

Hillel—Social, cultural and religious organization for Jewish students.

India Cultural Association — Cultural Society.

Institute of Electrical and Electronic Engineers — Collegiate branch of professional society.

Interdormitory Council — Representatives from men's and women's dorms who coordinate the athletic, social, cultural and scholarly activities among dormitory students.

International Student Organization — to further understanding and friendship of students of different nationalities.

Kappa Delta — National sorority for women.

Kappa Delta Pi—National honorary education society.

Kappa Sigma—National social fraternity.

Lambda Chi Alpha — National social fraternity.

Church of Jesus Christ of the Latter Day Saints Student Association — Campus organization of Mormon students.

Lloyd A. Nelson Geology Club.

M.A.Y.A. — Political, Mexican-American Youth Association.

M. E. C. H. A. — Movimiento Estudiantil Chicano de Aztlan.

Mexican Student Organization — Social Organization.

Mortar Board — Scholastic and service honorary for senior women.

Moslem Student Organization — Social — religious.

National Art Education Association.

Newman Club — Campus organization of Catholic students.

Nichiren Shoshu — Religious

Organization of Arab Students.

Panhellenic Council—Co-ordinating group for sororities.

Pershing Rifles—National honorary ROTC fraternity.

Phi Kappa Sigma Colony of U.T. El Paso — Social.

Phrateres International — International independent service and social group for women.

Physical Education Majors Club.

Pi Delta Phi—Honorary French society.

Pi Sigma Alpha — Honorary political science society.

Pi Tau Sigma — Honorary — mechanical engineering.

Pre-Med Club.

ROTC Sponsors — Auxiliary drill team to the Cadet Corps.

Sigma Alpha Epsilon—National social fraternity.

Sigma Alpha Eta — Collegiate branch of a professional society.

Sigma Alpha Iota — Women's Honorary Professional Music Fraternity.

Sigma Delta Pi—Honorary Spanish society.

Sigma Gamma Epsilon — Honorary society for earth sciences.

Society of Women Engineers.

Spurs — National service organization for Sophomore women.

Student Association for Social Workers — Special Interest.

Student Education Association — Professional organization.

Student Legal Association.

Student International Meditation Society — Special Interest.

Tau Beta Pi — Honorary engineering society.

Tau Beta Sigma—Honorary service society to promote band activities.

Tau Kappa Epsilon — National social fraternity.

The Engineer Magazine — Professional.

University Players — Drama group.

Upsilon Eta Chapter of Alpha Phi Omega — National Service Fraternity.

Wesley Foundation—Campus organization for Methodist students.

Young Democrats Club.

Young Republicans Club.

Zeta Tau Alpha—National social sorority.

ANNUAL EVENTS

And of course there are a number of all-campus activities every year in which a student may participate. Some of these are:

Student Leader Conferences

Before each semester, selected student leaders participate in a Student Association function designed to stimulate, revise, and evaluate the student activities for the coming semester. This is one of the pro-

grams in which the Student Association seeks to keep abreast of the continual changes in our modern campus community.

"M" Day

"M" Day originally began in 1923, when the "M" was first laid out on the east side of Mt. Franklin. Since then the Student Association has moved the "M" to the more appropriate location overlooking the Sun Bowl stadium. The freshmen of every fall semester are intrusted with the task of repairing and re-whitewashing the "M" under the supervision of the Student Association and the Student Senate. The refurbishing of the "M" is followed by the traditional "Bean Feed" where all participants enjoy their first taste of college life.

Homecoming

Homecoming is the festive occasion when students display their enthusiasm and spirit by honoring Ex-students in their annual return to the University campus. A Homecoming Queen is selected to reign over the week's activities. The Homecoming Queen and her court are crowned at the dance and are presented at the Homecoming football game.

Greek Week

During the Spring Semester, greek social fraternities and sororities sponsor a week of social activity. Included in this are a "slave sale," splash day, the annual Sing-Song, several races and a dance. Awards are given in competitive categories during the week.

Sing Song

The annual Sing Song is a concert in which independent, fraternity and sorority choruses compete. Trophies are awarded to the outstanding groups based on their productions and everyone is invited to join in the song-fest.

Variety Show

Alpha Psi Omega, the drama fraternity, sponsors a program in which organizations get a taste of the theatrical world. Campus talent shows itself, and winners are selected and awarded trophies. The proceeds of the contest go toward a drama scholarship.

Religion in Life Week

In the life of every wholly developed

individual a spiritual foundation is essential. Speeches by religious leaders, informal discussions, and personal conferences are presented as a means of acquainting—or reminding—the student of religion's vital place in his world. Catholic, Jewish, and Protestant authorities are given the opportunity to encourage the student in his spiritual quest.

Beard Growing Contest

January 1st is the date of commencement for the traditional Beard Growing Contest sponsored by the Engineering Council at The University of Texas at El Paso. Anyone entering the contest must begin this day and may not shave until St. Patrick's Day when the winners are selected. All male students are eligible to enter this traditional engineer's contest.

St. Pat's Day and the Hard Luck Dance

The proud engineers at The University of Texas at El Paso initiate their freshmen engineers during an all-day picnic. The Hard Luck Dance follows the day's activities and the winners of the annual Beard Growing Contest are announced. Prizes are awarded to the person with the longest and handsomest beard and the one showing the least results with the most effort. Prizes are also given to the couple wearing the best Hard Luck costume. The public is invited to attend this dance and reminisce about the traditions of the Texas College of Mines.

Women's Honors Night

In the Spring Semester, AWS, with the cooperation of Chenrizig, Spurs, Alpha Lambda Delta and Cardinal Key, honors women students for scholastic achievements. Candidates for AWS officers for the following year are introduced and new members for Chenrizig, Spurs, Alpha Lambda Delta, and Cardinal Key are tapped. Awards are presented to an outstanding faculty woman and to the outstanding freshman woman. Also, at this time, Panhellenic trophies are presented to sororities with the highest scholastic average.

Military Ball

In the spring, the ROTC Cadets will hold their annual Military Ball. The ROTC Queen will be crowned and her Court of Sweethearts will be honored followed by a gala evening of dancing to the music of a popular orchestra. The University of Texas at El Paso Company of the National Society of Scabbard and Blade sponsors this event and promises all cadets and

their invited guests an evening to be remembered.

Miss UTEP Contest

In April the annual Miss UTEP contest will be held. Judges select a Miss UTEP on the basis of talent and beauty. Four awards are given. The overall winner is awarded the title of Miss UTEP until the following contest. An alternate Miss UTEP, a talent winner, and a beauty winner are also chosen.

Campus Carnival

This annual Spring Fiesta finds campus organizations preparing fun booths of various types trying to capture the business of the huge crowds. Beautiful decorations and festive music are the keynotes of the dance held that evening culminating one of the highlights of the Spring semester.

Beauty Contest

The selection of Campus Beauty Queens is sponsored annually by the Flowsheet for their feature section. Nominations are made by organizations on campus. A preliminary and final contest are held. Five winners are usually announced.

Aggie - Miner Day

Each spring, The University of Texas at El Paso and New Mexico State hold an annual Spring Play Day. Competition consists of Basketball, Volleyball, Swimming, Track, Tennis, Bowling, and Ping-Pong. Each school's Intramural champions compete for trophies in each activity.

The highlight after a full day of competition is the Awards Banquet.

Honors Convocation Day

This is a traditional May Assembly in which honor is paid to those students excelling in scholarship during the previous year. The installation of the newly elected officers of the Student Association and the Student Senate as well as the Supreme Court Justices takes place.

Official Regulations

Student Expense

[TUITION]

Regulations Affecting Student Life

[CONDUCT - DISCIPLINE]

Scholastic Regulations

[GRADES]

Statistics

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STUDENT EXPENSES



Registration and laboratory fees are payable on a semester basis at the beginning of each semester and must be paid in full before the student will be permitted to enter class or laboratory. The Business Office does not cash checks. However, checks are accepted in settlement of obligations to the University provided they are in the amount owed the University, and the maker has not previously had a check dishonored.

SUMMARY OF TUITION AND FEES

TUITION, STUDENT SERVICE FEE & STUDENT BUILDING USE FEE

<i>Semester Hours</i>	<i>Tuition</i>	<i>Student Service Fee</i>	<i>Student Building Use Fee</i>	<i>Total</i>
RESIDENT STUDENTS				
LONG SESSION (EACH SEMESTER)				
21	\$84.00	\$26.00	\$50.00	\$160.00
20	80.00	26.00	50.00	156.00
19	76.00	26.00	50.00	152.00
18	72.00	26.00	50.00	148.00
17	68.00	26.00	50.00	144.00
16	64.00	26.00	50.00	140.00
15	60.00	26.00	50.00	136.00
14	56.00	26.00	50.00	132.00
13	52.00	26.00	50.00	128.00
9 — 12	50.00	26.00	50.00	126.00
8 or Less	50.00	6.00	50.00	106.00
SUMMER SESSION (EACH TERM)				
12	48.00	6.00	25.00	79.00
11	44.00	6.00	25.00	75.00
10	40.00	6.00	25.00	71.00
9	36.00	6.00	25.00	67.00
8	32.00	6.00	25.00	63.00
7	28.00	6.00	25.00	59.00
6 or Less	25.00	6.00	25.00	56.00
NON-RESIDENT STUDENTS				
LONG SESSION (EACH SEMESTER)				
21	\$840.00	\$26.00	\$50.00	\$916.00
20	800.00	26.00	50.00	876.00
19	760.00	26.00	50.00	836.00
18	720.00	26.00	50.00	796.00
17	680.00	26.00	50.00	756.00
16	640.00	26.00	50.00	716.00
15	600.00	26.00	50.00	676.00
14	560.00	26.00	50.00	636.00
13	520.00	26.00	50.00	596.00
12	480.00	26.00	50.00	556.00

STUDENT EXPENSES

Semester Hours	Tuition	Student Service Fee	Student Building Use Fee	Total
11	440.00	26.00	50.00	516.00
10	400.00	26.00	50.00	476.00
9	360.00	26.00	50.00	436.00
8	320.00	6.00	50.00	376.00
7	280.00	6.00	50.00	336.00
6	240.00	6.00	50.00	296.00
5	200.00	6.00	50.00	256.00
4	160.00	6.00	50.00	216.00
3	120.00	6.00	50.00	176.00
2	80.00	6.00	50.00	136.00
1	40.00	6.00	50.00	96.00

SUMMER SESSION (EACH TERM)

12	\$480.00	\$6.00	\$25.00	\$511.00
11	440.00	6.00	25.00	471.00
10	400.00	6.00	25.00	431.00
9	360.00	6.00	25.00	391.00
8	320.00	6.00	25.00	351.00
7	280.00	6.00	25.00	311.00
6	240.00	6.00	25.00	271.00
5	200.00	6.00	25.00	231.00
4	160.00	6.00	25.00	191.00
3	120.00	6.00	25.00	151.00
2	80.00	6.00	25.00	111.00
1	40.00	6.00	25.00	71.00

NON-RESIDENT STUDENTS ENROLLED CONTINUOUSLY SINCE THE SPRING SEMESTER OF 1971 (See requirements on Page 262)

LONG SESSION (EACH SEMESTER)

12 or More	200.00	26.00	50.00	276.00
11	183.50	26.00	50.00	259.50
10	167.00	26.00	50.00	243.00
9	150.50	26.00	50.00	226.50
8	134.00	6.00	50.00	190.00
7	117.50	6.00	50.00	173.50
6	101.00	6.00	50.00	157.00
5	84.50	6.00	50.00	140.50
4	68.00	6.00	50.00	124.00
3 or Less	51.50	6.00	50.00	107.50

SUMMER SESSION (EACH TERM)

6 or More	101.00	6.00	25.00	132.00
5	84.50	6.00	25.00	115.50
4	68.00	6.00	25.00	99.00
3 or Less	51.50	6.00	25.00	82.50

The University of Texas at El Paso

<i>Semester Hours</i>	<i>Tuition</i>	<i>Student Service Fee</i>	<i>Student Building Use Fee</i>	<i>Total</i>
ALIEN STUDENTS				
LONG SESSION (EACH SEMESTER)				
21	\$294.00	\$26.00	\$50.00	\$370.00
20	280.00	26.00	50.00	356.00
19	266.00	26.00	50.00	342.00
18	252.00	26.00	50.00	328.00
17	238.00	26.00	50.00	314.00
16	224.00	26.00	50.00	300.00
15	210.00	26.00	50.00	286.00
9 — 14	200.00	26.00	50.00	276.00
8 or Less	200.00	6.00	50.00	256.00
SUMMER SESSION (EACH TERM)				
12	168.00	6.00	25.00	199.00
11	154.00	6.00	25.00	185.00
10	140.00	6.00	25.00	171.00
9	126.00	6.00	25.00	157.00
8	112.00	6.00	25.00	143.00
7 or Less	100.00	6.00	25.00	131.00
NURSING STUDENTS				
LONG SESSION (EACH SEMESTER)				
12 or More	\$50.00	\$26.00	\$50.00	\$126.00
11	44.00	26.00	50.00	120.00
10	40.00	26.00	50.00	116.00
9	36.00	26.00	50.00	112.00
8	32.00	6.00	50.00	88.00
7	28.00	6.00	50.00	84.00
6	24.00	6.00	50.00	80.00
5 or Less	20.00	6.00	50.00	76.00
SUMMER SESSION (EACH TERM)				
6 or More	25.00	6.00	25.00	56.00
5 or Less	20.00	6.00	25.00	51.00

The fees shown in these schedules must be paid by all students registering for credit.

Laboratory Fees are charged, in addition to the above fees, in those courses where applicable. (See pages 263-4.)

Students registered for thesis credit only, in those instances where such credit is the final credit hour requirement for the degree in progress, shall pay a proportionately less amount for tuition. (See requirements on page 262.)

RESIDENCE CLASSIFICATIONS

Categories and Generalized Guidelines for Establishing Texas Residency

1. Minors

An individual, under twenty-one (21) years of age, whose family resides in another state or has not resided in Texas for the 12-month period immediately preceding the date of registration shall be classified as a nonresident student;

An individual twenty-one (21) years of age or under whose family has not resided in Texas for the 12-month period immediately preceding the date of registration shall be classified as a nonresident student regardless of whether he has become the legal ward of residents of Texas or has been adopted by residents of Texas while he is attending an educational institution in Texas, or within a 12-month period before his attendance, or under circumstances indicating that the guardianship or adoption was for the purpose of obtaining status as a resident student;

An individual 21 years of age or under whose parents were residents of Texas at the time of the student's registration is entitled to pay the resident tuition fee following the parents' change of legal residence to another state, as long as the individual remains continuously enrolled in a regular session in a state-supported institution of higher education.

2. Residence of Individuals Over Twenty-One

An individual twenty-one (21) years of age or over who has come from outside Texas and who is gainfully employed in Texas for a 12-month period immediately preceding registration in an educational institution shall be classified as a resident student as long as he continues to maintain a legal residence in Texas.

An individual twenty-one (21) years of age or over who resides out of the state or who has come from outside Texas and who registers in an educational institution before having resided in Texas for a 12-month period shall be classified as a nonresident student.

A nonresident student classification is presumed to be correct as long as the residence of the individual in the state is primarily for the purpose of attending an educational institution. After residing in Texas for at least twelve (12) months, a nonresident student may be reclassified as a resident student as provided in the rules and regulations adopted by the Coordinat-

ing Board, Texas College and University System. Any individual reclassified as a resident student is entitled to pay the tuition fee for a resident of Texas at any subsequent registration as long as he continues to maintain his legal residence in Texas.

3. Married Students

A nonresident who marries and remains married to a resident of Texas, classified as such under this Act at the time of the marriage and at the time the nonresident registers, is entitled to pay the resident tuition fee regardless of the length of time he has lived in Texas, and any student who is a resident of Texas who marries a nonresident is entitled to pay the resident tuition fee as long as he does not adopt the legal residence of the spouse in another state.

4. Military Personnel and Veterans

Military personnel are classified as provided by this section in the following manner:

An officer, enlisted man or woman, selectee or draftee of the Military Service of the United States who is assigned to duty in Texas is entitled to register himself, his spouse, and their children in a state institution of higher education by paying the tuition fee and other fees or charges required of Texas residents, without regard to the length of time he has been assigned to duty or resided within the state.

A person on military service who wishes to pay the resident tuition fee for himself or his dependents must submit at the time of each registration a statement from his Commanding Officer or Personnel Officer certifying that he is then on permanent as distinguished from temporary military assignment in Texas.

As long as they reside continuously in Texas, the spouse and children of a member of the Armed Forces of the United States who has been assigned to duty elsewhere immediately following assignment to duty in Texas are entitled to pay the tuition fees and other fees or charges provided for Texas residents.

A person who enrolls in an institution of higher education following his separation from military service must be classified as a nonresident student unless, (1) he was a legal resident of Texas at the time he entered military service and has not relinquished that residence, (2) he can prove that during his military service he has, in fact, established a bona fide, legal residence in Texas at a time at least 12 months prior to his registration, or (3) he has resided in Texas other than as a student for 12 months prior to his registration

and subsequent to his discharge from service.

The spouse and children of a member of the Armed Forces of the United States who dies or is killed are entitled to pay the resident tuition fee, if the wife and children become residents of Texas within 60 days of the date of death;

If a member of the Armed Forces of the United States is stationed outside Texas and his spouse and children establish residence in Texas by residing in Texas and by filing with the Texas institution of higher education at which they plan to register a letter of intent to establish residence in Texas, the institution of higher education shall permit the spouse and children to pay the tuition, fees, and other charges provided for Texas residents without regard to length of time that they have resided within the State.

5. Employees of Institutions of Higher Education Other Than Students

A teacher, professor, or other employees of a Texas institution of higher education is entitled to register himself, his spouse, and their children in a state institution of higher education by paying the tuition fee and other fees or charges required for Texas residents without regard to the length of time he has resided in Texas. A teacher, professor, or other employee of a Texas institution of higher education is any person employed at least one-half time on a regular monthly salary basis by a state institution of higher education.

6. Student Employees

A teaching assistant, research assistant, or other student employee of any institution covered by this section is entitled to register himself, his spouse, and their children in a state institution of higher education by paying the tuition fees and other fees or charges required for Texas residents, without regard to the length of time he has resided in Texas; provided that said student employee is employed at least one-half time in a position which relates to his degree program under rules and regulations established by the employer institution.

7. Competitive Scholarships

A nonresident student holding a competitive scholarship of at least \$200 for the academic year or summer for which he is enrolled is entitled to pay the fees and charges required of Texas residents without regard to the length of time he has resided in Texas, provided that he must compete with other students, including Texas residents, for the scholarship and

that the scholarship must be awarded by a scholarship committee officially recognized by the administration of the institution of higher education.

8. Citizens of Any Other Country Other Than the United States of America

An alien who is living in this country under a visa permitting permanent residence or who has filed with the proper Federal immigration authorities a declaration of intention to become a citizen has the same privilege of qualifying for resident status for fee purposes under this Act as has a citizen of the United States.

9. Student Responsibilities

The responsibility of registering under the proper residence classification is that of the student, and if there is any question of his right to classification as a resident of Texas, it is his obligation, prior to or at the time of his registration, to raise the question with the administrative officials of the institution in which he is registering and have such officially determined.

Every student who is classified as a resident student but who becomes a nonresident at any time by virtue of a change of legal residence by his own action or by the person controlling his domicile is required to notify the proper administrative officials of his institution at once.

10. Official Change of Residence Status

Every student classified as a nonresident student shall be considered to retain that status until such time as he shall have made written application for reclassification in the form prescribed by the institution and shall have been officially reclassified in writing as a resident of Texas by the proper administrative officers of the institution.

TUITION

Tuition rates have been established under the authority of House Bill No. 43, Sixty-Second Legislature, Regular Session, 1971. These rates of tuition are subject to change by the Legislature of the State of Texas. Rates for each semester of the Long Session and each term of the Summer Session are:

Resident Students

\$4.00 per semester credit hour with Long Semester minimum of \$50.00 and Summer Term minimum of \$25.00. Final credit-hour requirements for thesis only — \$12.00 for three semester credit hours.

Non-Resident Students

\$40.00 per semester credit hour (no minimum). Final credit-hour requirement for thesis only - \$50.00 for three semester credit hours. Any non-resident student who was enrolled for the Spring Semester of 1971 may continue to enroll at the same tuition rate that was effective at the time of his original enrollment until one of the following conditions first occurs: (1) The student receives a degree at the degree level toward which he was working during the Spring Semester of 1971, or (2) The student voluntarily withdraws from attendance or is involuntarily withdrawn for disciplinary reasons or for failing to meet the University's academic standards, or (3) The termination of the Spring Semester of 1975. The student must enroll for each long semester in order to qualify for the rates in effect during the Spring Semester of 1971, which were:

Semester Hours	Tuition
12 (or more)	\$200.00
11	183.50
10	167.00
9	150.50
8	134.00
7	117.50
6	101.00
5	84.50
4	68.00
3 (or less)	51.50

Alien Students

\$14.00 per semester credit hour with Long Session semester minimum of \$200.00 and Summer Session term minimum of \$100.00. Final credit-hour requirement for thesis only-\$50.00 for three semester credit hours.

Nursing Students

Semester Hours	Long Session Semester	Summer Session Term
12 (or more)	\$50.00	\$25.00
11	44.00	25.00
10	40.00	25.00
9	36.00	25.00
8	32.00	25.00
7	28.00	25.00
6	24.00	25.00
1 - 5 (minimum)	20.00	20.00

Penalties for Payment of Wrong Fee

The responsibility of registering under the proper residence is placed upon the student, and it is his duty, at or before registration, if there is any possible ques-

tion of his right to legal residence in Texas under the State law and University rules, to raise the question with the Director of Admissions and have such question settled prior to registration. There can be no change of residence except upon express authorization by the Director of Admissions. Attempt on the part of a non-resident to evade the non-resident tuition fee will be taken seriously and may lead to expulsion.

Any student who wrongfully pays the Texas rather than the non-resident tuition fee is subject to a fine of ten (\$10.00) dollars for each such violation.

All questions relative to residency must be submitted to the Office of the Director of Admissions.

REFUND OF TUITION

A refund of the tuition is made only to students who officially withdraw from school. In no case shall a refund of the tuition fee be made for dropped courses or for transfers to courses carrying a lesser number of credit hours, i.e., there shall be no refund of the tuition if the student remains enrolled in school. If the withdrawal is official and falls within the following time limit, a student will receive a percentage refund as follows:

Long Session Refund	Percentage
Before or during first week of class work	70%
During second week of class work	60%
During third week of class work	40%
During fourth week of class work	20%
During 5th week & thereafter	No Refund

Summer Session Refund

During first three class days, 70%; on fourth, fifth or sixth class day, 50%; after sixth class day, no refund.

In no case shall the total refund exceed 70% of the tuition.

There will be no refund made of course and/or laboratory fees after the student has met the course or laboratory session. No refund will be made until 15 days after beginning of classes, but, upon written request, a check covering all refunds due will be mailed to the address left with the Business Manager.

No refund provided for above will be granted unless applied for within one year after official withdrawal.

Exemption of Ex-Service Men

Men and women who are classified as residents of Texas for educational purposes and who were so classifiable at time of entry into military service, and who served

in the Armed Forces or in certain of the auxiliary services in World War I, World War II, the Korean conflict, and were honorably discharged therefrom (except those who were discharged because of being over the age of 38 or because of a personal request), and who are not eligible to receive educational benefits provided for veterans by the United States Government, are exempted from the payment of tuition and certain required academic fees but not from the payment of deposits. To obtain this exemption, the student must make application on the form prescribed by and obtained from the Business Manager. Certified or photostatic copies of the discharge certificate and service record must be attached to the application. Exemption from fees described above also extends to children of members of the Armed Forces who were killed in action or died while in the service during World War II or the Korean conflict.

Late Registration Charge

Any student who with proper permission registers in the fall or spring semester after the appointed days for registering in that semester will be required to pay a special charge of \$5.00 for the first late day and \$2.50 for each additional late day to a maximum of \$15.00 to defray the cost of the extra services required to effect his late registration.

Laboratory Fees *per semester*

Art 3201, 3205, 3301, 3305, 3311, 3312, 3321	\$4.00
3202, 3203, 3204, 3208, 3215, 3302, 3303, 3304, 3308, 3315	8.00
3405, 3406, 3407, 3408, 3409, 3410, 3502	10.00
Biological Sciences 1107, 1108, 1212, 1215, 1217, 1319, 2423, 3105, 3106, 3214, 3216, 3318, 3422, 4211	6.00
2498, 3498, 4498, 5498, 6498	8.00
6425 — Transportation fee varies according to base	
Plant Sciences or Botany 1231, 1334, 1336, 2337, 2338, 3230, 3333, 3335	4.00
Microbiology 2241, 1346, 1452, 1456, 3240, 3345, 3451, 3455	6.00
1344, 1454, 3343, 3453	8.00
Chemistry 3103, 3104	4.00
1324, 1325 (Lab for 3324-25)	5.00
1321, 1322 (Lab for 3321-22), 1465, 4411, 4420	6.00
1351, 1352 (Lab for 3351-52), 2106, 2476, 4213, 4470	8.00

Geology and Physical Geography 2215, 3106, 3207, 3210, 3305, 3324, 3325, 3420, 3455, 4206, 4306, 4323, 4410	2.00
3421, 3472	3.00
1422, 3327, 3330, 3430, 3440, 4216, 4217, 4220	4.00
3103, 3104, 3205, 3208, 3359, 3405, 4101, 4102, 4458	5.00
6465 Transportation Fees	60.00
Health & Physical Education 1101, 1102, 1103	2.00
Mass Communication 3308 Fields of Photography; 4207 Elementary Photography	5.00
Broadcasting: 3320 TV Production, 3321 TV Production, 3404 Cinematography	5.00
Radio Stations: 1104, 1105, 1204, 1205, 1304, 1305, 1404, 1405	2.00
Mathematics 3124, 3324, 3429	8.00
Modern Languages 4101-2 French; 4101-2 German; 4101-2 Japanese; 4103-4 Latin; 4101-2 Russian; 4101-2 Spanish	2.00
Music: Group Instruction: 2171, 2172, 2175, 2176, 2177, 2178, 2179, 2271, 2272	4.00
Voice & Piano Sight: 2173, 2174 Applied: 2181, 2182, 2191, 2192, 2281, 2282, 2291, 2292, 2381, 2382, 2391, 2392, 2491, 2492	25.00
Applied: 3181, 3182, 3191, 3192, 3281, 3282, 3291, 3292, 4191, 4192, 4291, 4292	45.00
Applied: 3381, 3382, 3391, 3392, 3481, 3482, 3491, 3492, 4391, 4392, 4491, 4492	50.00
Physics: 1120, 1121, 3101, 3102, 4103, 4104, 4107, 4108	4.00
2343, 2446, 3330, 4320, 4321, 4324, 4339, 4340	5.00
Psychology 3103	2.00
3221, 3222, 3401	3.00
3523	5.00
Zoology: 1265, 1367, 1369, 1479, 2264, 2368, 3366, 3478	4.00
1471, 2473, 1477, 1481, 1472, 3470, 3476, 3480	6.00
1475, 2502, 3474, 3502, 4502, 5502	8.00
Business Administration: Accounting: 3211, 3212 — Principles of Accounting I & II	2.00
General Business: 3203 Introduction to Computers	8.00

LAB FEES (continued) per semester

Office Management and Business Education:	
3302 - Office Problems and Procedures	5.00
3101, 3102 (Typing) 3103, 3104 (Shorthand)	
3301 (Transcriptions)	5.00
3305 - Administrative Services	6.00
Production Management:	
3324 (Operations Research)	8.00
Statistics and Quantative Analysis	
3201 Fundamentals of Statistics; 3301 Intermediate Statistics	2.00
Engineering:	
Civil: 3442, 3448, 4456	2.00
4470	6.00
Electrical: 3251, 3442, 3465, 4277, 4278	2.00
2310, 2311, 2412	4.00
Mechanical: 3103, 3104, 3205, 3363, 3377, 3404, 3484, 3485, 3501, 4351, 4354, 4465, 4466, 4508	2.00
Metallurgical: 3101, 3102	4.00
3204, 3404, 3502, 4402, 4403, 4407, 4412, 4415, 4501, 4506, 4509, 4533, 4534	6.00

an exemption as mentioned on page 263 are not exempt from payment of this fee.

Student Service Fee - Under authority of legislation enacted by the 56th Legislature, The Board of Regents has authorized a Student Service Fee in the amount of \$26.00 for all students taking 9 or more semester hours and \$6.00 for all students taking 8 or less semester hours, for each semester of the long session and \$6.00 for each term of the Summer Session.

Activities to be supported from this source of income are the Health Service, Student Association, Intramurals, Intercollegiate Athletics, Student Publications, Swimming Pool, Band, Chorus, Chorale, Orchestra, Forensics, University Players, Opera, Ballet, Cultural Entertainment, Lyceum Series, and Ticket Center.

Refund of this fee will be made only under the same conditions as Refund of Tuition upon surrender to the Business Office of the Student Identification card, Athletic Ticket Book, and such other activity tickets as might be issued.

Parking Fee - The Board of Regents has approved a parking fee as follows for those students desiring to park cars on campus:

Fall Semester	\$5.00
Spring Semester	3.00
Summer Session	2.00

Note: The fee is payable only once during the school year and is in effect from the date paid to the end of the school year in which paid. There will be no refund made of the parking fee.

Miscellaneous Required Fees

Student Building Use Fee - In accordance with the provisions of Article 2909c, V.C.S., the Board of Regents of The University of Texas System requires that every student who registers in The University of Texas at El Paso pay a compulsory student building use fee of \$50.00 for each semester of the long session and \$25.00 for each six weeks summer term. Refund of this fee for students withdrawing is made on the same basis as refund of tuition.

Special Examination - A fee of \$1.00 is required of persons who wish to take an advanced standing examination, an examination to remove a condition, or an examination to be given at a time other than that for which it is regularly scheduled. Permission of his Dean must be secured before payment is made.

Graduation - A graduation fee of \$5.00 is required of candidates for graduation. A receipt showing payment of or exemption from this fee must be presented to the respective Dean at the time the degree application is filed. This fee must be paid each time an application for degree is filed and under no circumstances is subject to refund.

Veterans attending the University under

DEPOSITS

General Property Deposit	\$10.00
Military Property Deposit	20.00
Dormitory Deposit	25.00
Student Family Housing Deposit	25.00

General Property Deposit - Every student must make a General Property Deposit of \$10.00. This deposit is subject to charges for violation of Library rules and for loss of or damage to University property. The student, upon notice from the Business Manager, will be required to restore the deposit to the original amount any time it is reduced by fines or other charges. The payment must be made immediately upon request. Pending receipt of payment, no credit will be allowed on the work of that semester or term, and the student will be ineligible to re-enter the University.

General Property Deposits will be refunded only when a student ends his career at the University; Military Property Deposits will be refunded only when a student ends his military career at the University. No refund will be made to a student who plans to continue his education here, either at the close of the long session or summer term.

A property deposit which remains without call for refund for a period of four years from the date of last attendance at the University shall be forfeited and shall become the property of the Student Property Deposit account. Such funds will be invested and the income therefrom will be used for scholarship purposes and for the support of a general Student Union program. This policy applies to deposits heretofore paid as well as to those paid in the future.

Military Property Deposit — Students enrolling in Military Science courses are required to make a deposit of \$20.00. This deposit is subject to charges for military property lost, damaged, or destroyed, and is required to be restored to \$20.00 at the beginning of each year. If at the end of any semester the deposit is reduced because of charges to \$10.00 or less, it must be restored at that time to \$20.00. This deposit will be refunded upon successful completion of the R.O.T.C. course unless the student is released from his obligation under pertinent regulations prior to such successful completion.

Warning: Property issued to students enrolled in Military Science courses belongs to the United States Government. Every precaution must be taken to prevent loss or damage. All items must be accounted for at time of withdrawal or end of course.

Upon request of the Professor of Military Science, the University will withhold transcripts of grades and certificates of graduation from those students who, in the opinion of the Professor of Military Science, are improperly holding Government property.

RESIDENCE HALLS

The University considers it a distinct advantage for students to live in the Resi-

dence Halls on the campus. Every attention will be given to the improvement of the social and educational life of on-campus students.

The University of Texas at El Paso considers student housing as an integral part of the total educational process. Every dormitory is supervised by a dormitory director, student assistants, and an elective council, each of which endeavors to provide opportunities for social, cultural and academic development of all residents. All housing (except financial and physical plant matters) at The University of Texas at El Paso is administered by the Vice-President for Student Affairs who delegates supervision to the Director of Housing.

The University of Texas at El Paso may require that all single, full-time undergraduate students not living with their parents reside in on-campus residence halls to the capacity of the facilities.

The University administers two dormitories. There is a centrally located cafeteria fully equipped with modern facilities for furnishing meals. This cafeteria is available to all students, both boarding students and students who live off-campus.

To apply for student housing in the residence halls, send a \$25.00 Housing Deposit to the Housing Office and complete a Residence hall application which may be obtained from the Housing Office.

MARRIED STUDENT HOUSING

U.T. El Paso Village located on Oregon and Robinson Sts. on The University of Texas at El Paso Campus is a project of 60 family apartments. Each unit has upstairs and downstairs apartments and each apartment has two bedrooms, a living-dining room and a kitchen. The project was completed in 1963 and each apartment is air-conditioned. The apartments are unfurnished except that a stove and refrigerator are provided.

To be eligible for Student Family Housing, the husband must be a full-time student. To apply for Student Family Housing, send a \$50 Housing Deposit to the Housing Office and complete a Student Family Housing Application Form. Units rent for \$100.00 per month including all utilities except telephone.

All inquiries concerning Residence Halls should be directed to the

DIRECTOR OF HOUSING
The University of Texas at El Paso
KELLY HALL
EL PASO, TEXAS 79968

POLICIES AND PROCEDURES AFFECTING STUDENT LIFE

Detailed policies and procedures for student affairs are printed in the Student Handbook. The University of Texas at El Paso Institutional Supplement to the Rules and Regulations of the Board of Regents includes these chapters: Chapter 1 – Student Conduct and Discipline; Chapter 2 – Speech, Advocacy, and Assembly; Chapter 3 – Student Organizations; Chapter 4 – Student Publications.

The Rules and Regulations of the Board of Regents of The University of Texas System are available in the Office of the Vice-President for Student Affairs and the Student Association office.

The Student Handbooks are made available to all students at registration. Copies may be obtained from the Student Activities Office or the Student Association Office in The Union.



CONDUCT

The University of Texas at El Paso is a community of scholars whose members include faculty, students, and administrators. The University is dedicated to the development of ethically sensitive and morally responsible persons as well as the enlargement, dissemination, and application of knowledge. It seeks to achieve these goals by both formal and informal teaching, through research, and by creating an environment conducive to learning.

In establishing policies to govern student conduct, the University strives to achieve a balance between individual independence and the essential social control. In the matter of regulating student conduct, the aim is to encourage independence, self-direction, and maturity.

General Regulations

1. University students are expected to maintain a high standard of individual honor in their scholastic work. The attempt of any student to present as his own the work of another, or any work which he has not honestly performed, or to pass any examination by improper means, is a most serious offense and renders the offender liable to immediate suspension. The aiding and abetting of a student in any dishonesty is held to be an equally serious offense.

2. Through matriculation at the University, a student neither loses the rights nor escapes the responsibilities of citizenship. All students are expected and required to obey the law, to show respect for properly constituted authority, and to observe correct standards of conduct.

3. Illegal conduct (including the illegal use, possession, or sale of drugs or narcotics), excessive use of alcoholic beverages, dishonestly, gambling, and failure to respond promptly to official notices may subject the student to disciplinary action.

4. The possession and/or consumption of intoxicating beverages on University property is prohibited.

5. Hazing in state educational institutions is prohibited by state law.

6. Any student who, acting either singly or in concert with others, obstructs or disrupts, by force or violence, any teaching, research, administrative, disciplinary, public service, or other activity authorized to be held or conducted on the campus shall be subject to discipline, including expulsion. The words "force or violence" include such acts as "stand-ins," "sit-ins," and "lie-ins," when such acts are in fact obstructive or disruptive of any of the authorized activities listed above.

Penalties

Penalties which may be imposed include the following: admonition, warning probation, disciplinary probation, suspension, and expulsion. In addition, certain privileges may be withdrawn consistent with the severity of the offense and the rehabilitation of the student.

These penalties may be imposed singly or in any combination upon individuals, groups, or organizations.

A student who is suspended by the University for reasons other than academic performance shall be withdrawn by the Registrar and shall receive the grade of W in each course for which he is enrolled on the date his suspension becomes effective.

Debts

The University is not responsible for debts contracted by individual students or by student organizations.

The University expects all students and student organizations to conduct themselves honorably in all commercial trans-

actions. The University will not assume the role of a collection agency for organizations, firms and individuals to whom students may owe bills, nor will the University adjudicate disputes between students and creditors over the existence or the amounts of debts.

Debts Owed the University

In the event of nonpayment of debts owed to the University, one or more of the following actions may be taken: (a) a bar

against readmission of the student, (b) withholding of the student's official transcript, (c) withholding of a degree to which the student would otherwise be entitled and (d) involuntary withdrawal of the student.

Bad Checks

A student who gives the University a bad check, the fault not being that of the bank, or who does not make it good within five days will be withdrawn from the University.

SCHOLASTIC REGULATIONS

General

Current regulations are applicable to every student enrolled, regardless of the date of his admission. Interpretations or explanations contrary to the regulations herein set forth shall not be binding upon the University.

Student Responsibility

Each student is individually responsible for awareness of the current scholastic regulations of the University, the general and specific degree requirements in his major field, and those operational policies which apply to registration.

Selecting Courses

Although every effort is made to advise students, the final selection of courses is the responsibility of the individual student. All required freshman numbered courses in the student's curriculum must be completed by the time the student reaches senior classification; otherwise, no credit will be granted toward fulfilling degree requirements for the courses even though the courses must be completed. This loss of credit penalty may be waived by the appropriate academic dean upon the affirmative recommendation of the head of the student's major department. Inter-collegiate as well as intra-collegiate transfer students who lack required freshman numbered courses must register for one or more such courses each semester until all requirements have been completed. Transfer students with senior classification will receive credit for required freshman numbered courses provided the conditions as stated above are fulfilled.

Change of Major

A student who wishes to change his major must obtain the signatures of the department chairmen losing and gaining him and the change form must be filed with the appropriate Academic Deans.

Dropping Courses

The student should refer to the academic calendar in the front of this bulletin to identify periods during which adds, drops, and withdrawals may be accomplished. Such changes in registration are subject to the following conditions:

A course may be dropped by (a) authorization of the instructor and (b) filing with the Registrar. Forms are available in the offices of the academic departmental chairmen. Until the end of the fourth week

during a regular semester or until the second week of a summer session the student will receive an automatic W. From the beginning of the fifth week during a regular semester or the beginning of the third week during a summer session the instructor will give a grade of W or F depending on the instructor's judgment of the student's standing in the course. After the twelfth week of a regular semester or the fourth week of a summer session a student may not withdraw from a course unless he withdraws completely from the University. In this case each instructor will assign a grade of W or F based on his judgment of the student's standing in the course at the time of withdrawal.

On the recommendation of the instructor concerned, approved by his Academic Dean, a student may at any time be required to drop a course because of neglect, excessive absence, or lack of effort. In such case the grade is entered on the student's record as F.

Official Withdrawal

A student may withdraw from the University with the consent of his Academic Dean and clearance of all financial obligations with the Financial Aid Office and the Business Office. A student must present a clearance to his Dean from the Financial Aid Office before he will be considered for withdrawal. Students who officially withdraw from the University after the fourth week of class will receive grades of W in courses which they are passing and F in courses which they are failing.

Unofficial Withdrawal

Withdrawal from the University without consent of the student's Academic Dean constitutes an unofficial withdrawal. In such cases the student will receive a grade of F in each course for which he was registered. Students who withdraw unofficially must comply with the regulations listed under Readmission.

Late Registration

Any student who with proper permission registers in the fall or spring semester after the appointed days for registering in that semester will be required to pay a special charge of \$5.00 for the first late day and \$2.50 for each additional late day to a maximum of \$15.00 to defray the cost of the extra services required to effect his late registration.

Each class missed because of late regis-

tration will be counted as an absence, and classroom and laboratory work missed will be counted as zero unless the individual instructor grants the student permission to make up the work.

Absences from Classes

(a) Uniform and punctual attendance upon all exercises in a course in which he is due is strictly required. Absences will be considered as non-performance of work.

(b) A student has no right to be absent from any exercise in a course in which he is registered, except (1) for serious illness, or (2) by action of University rule, or (3) for other unavoidable circumstances. Absences caused by serious sickness or other unavoidable circumstances, in case the work missed has been done to the satisfaction of the instructor, shall not count toward dropping a student from a course.

(c) When, in the judgment of the instructor, a student has been absent to such a degree as to impair his status relative to credit for the course, the instructor shall report the absences and the student to his Dean; and, upon recommendation from the instructor, the Dean may drop the student from the course.

(d) Absences incurred by a student prior to his registration are not to be charged against said student, provided the work missed because of late registration is made up satisfactorily by mid-semester.

(e) It is the responsibility of the student to inform his Academic Dean and each instructor by telephone or any other means when absent over an extended period of time due to illness or any other valid reason. Otherwise the student may be dropped for non-attendance.

Amount of Work

In no case may a student register for more than twenty-one semester hours in a fall or spring semester.

Seven semester hours is the maximum load for which a student may register in a summer term without written permission from his Dean.

Classification

Full-time Students — Those who are registered for twelve or more credit hours.

Part-time Students — Those who are registered for less than twelve credit hours.

Freshman Students — Those having less

than thirty hours of credit.

Sophomore Students — Those having thirty or more, but less than sixty semester hours.

Junior Students — Those having sixty or more, but less than ninety semester hours.

Senior Students — Those having ninety or more semester hours and until graduation.

Examinations

General Regulations — All of the written work handed in by students is considered to be their own product, prepared without unauthorized assistance. Students are invited to co-operate with their instructors in maintaining the integrity of examinations and are strongly urged to inform them, without specifying the offenders, if cheating goes on in their classes.

A student absent from a test during the semester is graded zero on that test, unless for urgent reason he is given by the instructor the privilege of taking a postponed test at a time to be set by the instructor.

Students are expected (a) to remain in the examination room during the examination or quiz period; (b) to refrain from talking or smoking; and (c) to leave all notes and books where they will not be accessible during the examination or quiz, unless otherwise directed by the instructor.

Final Examinations

The Faculty has ruled that exemption from examinations may not be given.

In all examinations, account is taken of the student's use of English and of the form of the paper in general, the grade being lowered because of deficiencies in these regards as well as in the subject-matter proper.

Examinations are three hours in length and at the end of three hours all papers are taken up. It is not the policy of the University to administer a second final examination in a course.

A student absent from a final examination without an excuse from the Dean is graded *F* and required to repeat the semester's work if credit is desired for the course.

Credit by Examination

1. A student who is currently enrolled or who has enrolled and earned credit in a preceding semester or summer session may earn credit toward graduation at this institution by any of the following examinations:

Engineering and Business Students — Beginning freshmen may not register for

tions, subject to approval of the appropriate academic department and academic dean: a local Proficiency Examination prepared by the appropriate academic department, Advanced Placement Tests given by the College Entrance Examination Board, Achievement Tests or College Placement Tests developed by the College Entrance Examination Board and administered under conditions approved by the Board.

2. When credit by examination is entered on a student's permanent record, the following information shall be given: the equivalent course name and number, the kind of examination, the letter grade and the hours of credit.

3. Hours of credit and grade points earned by examination shall not be taken into consideration in calculating the student's grade-point average or academic standing for the semester or summer session in which he earned the credit and the grade.

4. In calculating the cumulative grade-point average for any purpose, including honors at graduation, hours of credit and grade points earned by examination as described in the above paragraphs 1, 2, and 3 shall be used in the same manner as any other hours of credit and grade points earned at The University of Texas at El Paso.

Proficiency and Advanced Standing Examinations

These are examinations for credit and are subject to the following conditions:

1. Proficiency examinations may be required for placement purposes by various departments. The student should consult specific departmental requirements.

2. Permission to take an advanced standing examination must be obtained from both the student's major department and the department administering the examination. The student must make arrangements with the administering department to take the examination.

3. Will be searching in character, strictly graded, and four hours in length.

4. The passing grade is "B."

5. No student is eligible who has registered for or has been given a grade other than W in the course or (2) who has earned credit in a course of higher level in the same academic subject.

6. Credit thus earned is applicable toward a degree from this University only.

7. In some instances, credit is granted on the basis of Achievement Tests and Advanced Placement Tests given by the College Entrance Examination Board, and on the basis of College Level Equivalency Examinations developed by the Educational Testing Service. Further information may be obtained from the appropriate academic department.

Scholarship

Grades and Grade Points

The grades used are: A (excellent), B (good), C (average), D (inferior but passing), F (failure), W (withdrawal from the course with a passing grade), P (in Progress) and I (incomplete). S and U respectively are used in reporting pass and fail work by students taking courses on this basis.

After consultation with his academic dean, the student, with the dean's permission, may withdraw from all courses and be assigned a grade of W in those courses.

A grade of A will be rated as four points per semester hour, a grade of B as three points per semester hour, a grade of C as two points per semester hour, and D as one point per semester hour.

The grade point average is determined by multiplying the number of semester hours of A grades by four, the hours of B by three, the hours of C by two, and the hours of D by one. The total of these values is then divided by the sum of the semester hours of A, B, C, D, F.

In computing academic standing at the end of a semester or summer session, hours of I, N, P, S and U are not counted as hours attempted; however, a student can be placed on probation or suspended with grades of I, N, or P outstanding. See also "Incomplete Work."

Courses Taken Pass/Fail

An undergraduate student in good standing may take a maximum of four elective courses as Pass/Fail with the following conditions:

1. Such courses may not be used for graduate credit.

2. Not more than two such courses may be taken in a given semester, nor more than one in a summer term of six weeks.

3. The student must indicate that he is taking the course on a Pass/Fail basis at the time of registration and may not change after the end of the regular period during which add-course petitions are approved.

4. To obtain credit in the course the student must meet the minimum standards and do all assigned work required of other students in the class for a passing grade.

5. Credits obtained as Pass/Fail may be used for elective credit only, even though the student should change his major or degree plan.

Courses taken on a Pass/Fail basis are disregarded in determining a student's grade point average. However, credits earned on a Pass/Fail basis may be applied as elective credits to fulfill the total credit requirements for a degree at this University. There is no assurance that such credits will be counted as transfer credits by another institution.

Higher Work after Failure

If a student makes an F in a course, he may not take up a more advanced course in the same subject until the course is taken again and satisfactorily completed.

Incomplete Work

At the end of the semester a grade of *Incomplete* may be given in exceptional circumstances and with the permission of the instructor and the proper Dean. When the grade of *Incomplete* is given at the end of the first semester, the work missed must be completed before grades are reported at the end of the second semester. If the *Incomplete* is given at the end of the second semester or at the end of either term of the Summer Session, it must be removed before grades are recorded for the fall semester following.

Repetition of Course

A student may repeat classes at U.T.E.P. This can be done in three ways:

1. Repeat at UTEP classes taken at UTEP.
2. Repeat at UTEP classes taken at other institutions.
3. Repeat at other institutions classes taken at the same institution and then have the credit transferred to UTEP.

When a student repeats a class, the grade used to figure the student's grade point average is the grade earned that last time the repeated class was taken. The student should notify the REGISTRAR'S

OFFICE, 209 Admin. Bldg., that the class has been repeated. This should be done during the next semester after the class is repeated.

Honor List

At the close of each semester the Registrar's Office will issue an honor list which will include the names of all full-time students who have a grade point average of at least 3.2 without any grades of I or F. (If an I is removed within two weeks after the end of the semester the last grade earned will be considered.)

In publishing the honor list the Schools of Business, Education, Engineering, Liberal Arts, and Sciences will be listed separately.

Students whose grades are all A will be given special mention.

Semester Reports

Semester grade reports will be available to students at the end of each semester.

Required Minimum Academic Performance

Students' Responsibility

Each student is held responsible for knowing his academic status and for knowing whether he is eligible to re-enroll in the University. If it is determined that an ineligible student has enrolled, he will be dropped immediately.

Minimum Requirements

The minimum academic performance which can be accepted is that which is consistent with progress toward a degree, i.e., achieving a cumulative grade point average (GPA) of 2.0 over the number of credit hours required. In the event that a student does not make significant progress toward achieving the minimum GPA he shall be placed on scholastic probation for not more than two semesters. Failure to exhibit an acceptable level of progress toward restoring the GPA while on scholastic probation shall result in enforced academic suspension.

A student accumulating the following

grade point deficiencies shall be placed on scholastic probation:

	<i>Maximum Deficiencies</i>
Less than 25 attempted credit hours	15 grade points
25 to 59 attempted credit hours	10 grade points
60 to 80 attempted credit hours	5 grade points
90 or more attempted credit hours	0 grade points

Attempted credit hours include hours attempted at other colleges and universities.

Scholastic Probation

A student informed by notation on a semester grade report that he has been placed on scholastic probation may not register for more than 16 hours except by written permission of his academic Dean.

Removal of Scholastic Probation

A student will be removed from scholastic probation upon restoring the grade points to the required level, excepting that no student may remain on scholastic probation for more than two successive semesters for a total of more than 24 credit hours if he is a part-time student. Failure to meet these conditions will result in enforced academic suspension.

Enforced Academic Withdrawal*

A student shall be dropped:

1. When he fails to meet a 2.0 grade-point average in his next period of attendance after having been on scholastic probation or suspension. However, a student who fails to remove scholastic probation will not be dropped if he has a cumulative grade-point average of 2.5 and has earned 30 semester credit hours at this institution.
2. When he does not pass any of his work in a semester or summer session.
3. A student enrolled for only one course will not be dropped when his grade is below the minimum requirement. However, the student must have his Academic Dean's approval to enroll in a subsequent semester or summer term.

A student ineligible for registration because of academic failure may submit a

*Does not pertain to Provisional Students.

petition to his Dean for re-instatement. The petition must be in the form of a letter and must be accompanied by a transcript of the students' academic record. Each such application will be considered on its merits. A student so re-instated will be on such terms of Scholastic Probation as the Dean may require.

Readmission of Students Dropped for Scholastic Reasons

A student ineligible for registration because of enforced academic suspension may, in view of exceptional circumstances contributing to his less than minimum performance, submit a petition to his Dean for re-instatement. The petition must be in the form of a letter and must be accompanied by a transcript of the student's academic record. Each such application will be considered on its merits. A student so re-instated will be on such terms of Scholastic Probation as the Dean may require.

Under normal circumstances a student who is ineligible for registration because of enforced academic suspension is eligible for readmission on scholastic probation after the following time intervals have elapsed:

1. Dropped for the 1st and 2nd time: (a) Failure at end of the fall semester — the succeeding spring semester. (b) Failure at the end of the spring semester — the succeeding summer session and the fall semester. (c) Failure at the end of the summer session — the succeeding fall semester.
2. Dropped for the third time: Extended Suspension. A student on Extended Suspension is ineligible to re-enter the University for a period of four calendar years. After this period the student is eligible to enter the University on scholastic probation. If the scholastic probation is removed, the student will then have the option of (a) meeting remaining requirements for graduation work or (b) meeting the requirements for graduation from courses attempted only after re-entry from Extended Suspension. If option (a) is chosen, the grade-point average will be computed according to rules in force at the time of his return. In either case, the entire academic record is to be maintained as a permanent part of the student's file. If option (b) is chosen, a notation will be made that only the latter portion was involved in computing requirements for graduation.

DEGREES CONFERRED

	CONFERRED IN 1971			CONFERRED IN 1972			TOTAL		
	Men	Women	Both	Men	Women	Both	CONFERRED 1916 - 1972		
ENGINEERING:									
Engineer of Mines	----	----	---	---	----	---	49		
Bachelor of Science in Mining Engineering	----	----	---	---	----	---	397		
Bachelor of Science in Engineering:									
Civil	----	----	---	---	----	---	120		
Electrical	----	----	---	---	----	---	147		
Bachelor of Science in Civil Engineering	28	1	29	32	0	32	247		
Bachelor of Science in Electrical Engineering	50	0	50	46	0	46	432		
Bachelor of Science in Mechanical Engineering	34	0	34	42	1	43	185		
Bachelor of Science in Metallurgical Engineering	12	1	13	18	0	18	195	1772	
<hr/>									
ARTS and SCIENCE:									
Bachelor of Arts	273	167	440	254	170	424	6871		
Bachelor of Science in the Sciences	102	33	135	139	37	176	1717		
Bachelor of Business Administration	229	34	263	271	29	300	2494		
Bachelor of Music	4	7	11	10	13	23	292		
Bachelor of Science in Education	126	319	445	96	259	355	3852	15226	
<hr/>									
GRADUATES:									
Master of Arts	31	33	64	33	30	63	1199		
Master of Education	69	47	116	66	67	133	939		
Master of Science	74	6	80	84	8	92	349	2487	
<hr/>									
TOTAL DEGREE CONFERRED								19,485	

Statistical Summaries

STUDENTS — LONG SESSION 1971-72

SCHOOL OF LIBERAL ARTS	<i>Men</i>	<i>Women</i>	<i>Total</i>
Freshmen	1632	1134	2766
Sophomores	508	403	911
Juniors	333	217	550
Seniors	353	206	559
SCHOOL TOTALS	2826	1960	4786
<hr/>			
SCHOOL OF SCIENCE			
Freshmen	507	182	689
Sophomores	192	76	268
Juniors	193	56	249
Seniors	193	52	245
SCHOOL TOTALS	1085	366	1451
<hr/>			
SCHOOL OF BUSINESS ADMINISTRATION			
Freshmen	717	175	892
Sophomores	374	83	457
Juniors	316	50	366
Seniors	382	40	322
SCHOOL TOTALS	1689	348	2037
<hr/>			
SCHOOL OF EDUCATION			
Freshmen	250	417	667
Sophomores	159	305	464
Juniors	154	271	425
Seniors	162	292	454
SCHOOL TOTALS	725	1285	2010
<hr/>			
SCHOOL OF ENGINEERING			
Freshmen	449	11	460
Sophomores	222	6	228
Juniors	158	0	158
Seniors	189	2	191
SCHOOL TOTALS	1018	19	1037
<hr/>			
POSTGRADUATE	1083	575	1658
<hr/>			
SCHOOL OF NURSING			
Freshmen	31	189	220
Sophomores	9	45	54
Juniors	4	18	22
Seniors	3	6	9
SCHOOL TOTALS	47	258	305
<hr/>			
<i>Total Individual Students</i>	8473	4808	13281
<hr/>			
SUMMER SESSIONS 1972			
Students registered in first term	3433	2459	5892
Students registered in second term	2779	1777	4556
SUMMER TOTALS	6212	4236	10448
<i>Total Individuals in Summer</i>	3966	2931	6897



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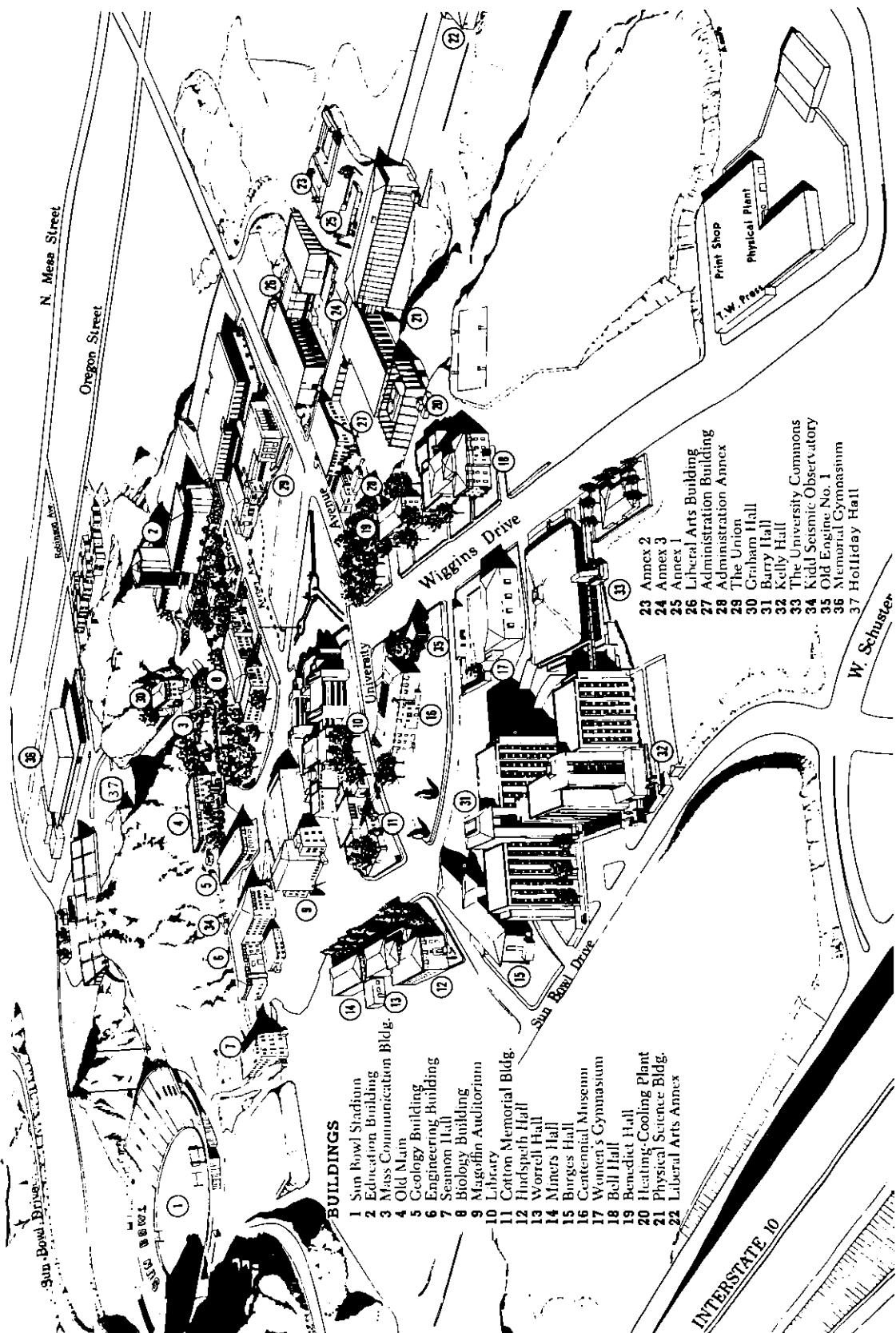
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- 1 Sun Bowl Stadium
- 2 Education Building
- 3 Mass Communication Bldg.
- 4 Old Main
- 5 Geology Building
- 6 Engineering Building
- 7 Seamon Hall
- 8 Biology Building
- 9 Magoffin Auditorium
- 10 Library
- 11 Cotton Memorial Bldg.
- 12 Hindspeth Hall
- 13 Worrell Hall
- 14 Miners Hall
- 15 Borges Hall
- 16 Centennial Museum
- 17 Women's Gymnasium
- 18 Bell Hall
- 19 Benedict Hall
- 20 Heating-Cooling Plant
- 21 Physical Science Bldg.
- 22 Liberal Arts Annex

- 23 Annex 2
- 24 Annex 3
- 25 Annex 1
- 26 Liberal Arts Building
- 27 Administration Building
- 28 Administration Annex
- 29 The Union
- 30 Graham Hall
- 31 Barry Hall
- 32 Kelly Hall
- 33 The University Commons
- 34 Kidd Seismic Observatory
- 35 Old Engine No. 1
- 36 Memorial Gymnasium
- 37 Hotliday Hall

INTERSTATE 10

