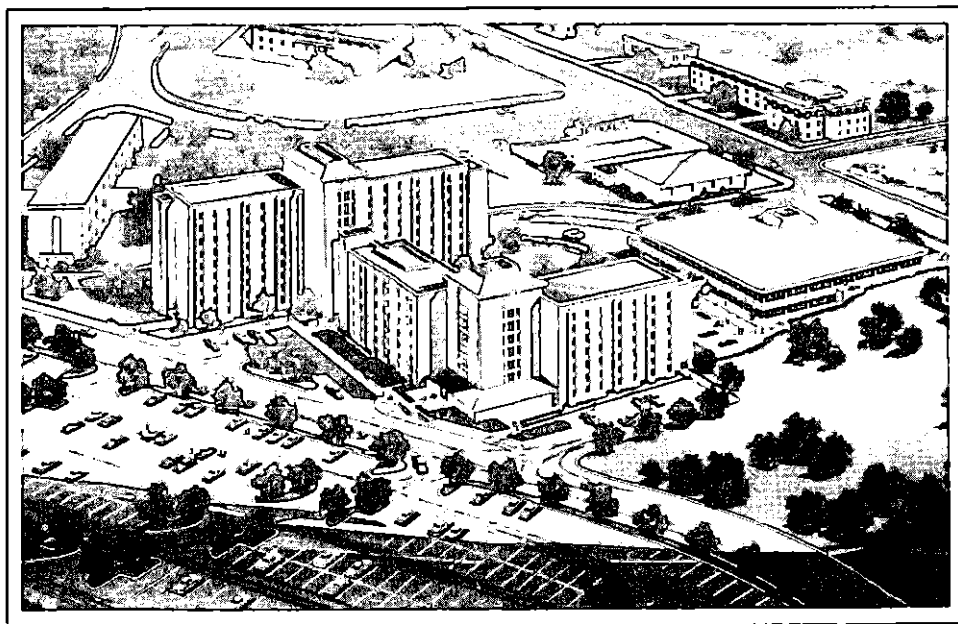


*The University of Texas  
at El Paso*



**BULLETIN**

CATALOG ISSUE - 1970-71 SESSIONS

THE UNIVERSITY OF TEXAS AT EL PASO 1970-71

## C O N T E N T S

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<i>Calendar</i>	— [ 2 - 3 ]
<i>Board of Regents</i>	— [ 4 ]
<i>Officers of Administration</i>	— [ 5 - 7 ]
<i>Faculty</i>	— [ 8 - 23 ]
<i>Description of the University and Pictures</i>	— [ 25 - 37 ]
<i>Admission Requirements</i>	— [ 39 - 40 ]
<i>Curriculum and Degree Requirements</i>	— [ 41 - 45 ]
<i>School of Business</i>	— [ 61 - 63 ]
<i>School of Education</i>	— [ 70 - 75 ]
<i>School of Engineering</i>	— [ 46 - 53 ]
<i>School of Liberal Arts</i>	— [ 55 - 59 ]
<i>School of Science</i>	— [ 60 - 64 ]
<i>Teaching and Degree Plans</i>	— [ 67 - 75 ]
<i>Graduate School</i>	— [ 76 - 80 ]
<i>Description of Courses Offered</i>	— [ 83 - 223 ]
<i>Student Expenses and Fees</i>	— [ 237 - 242 ]
<i>Scholarship and Loan Funds</i>	— [ 225 - 228 ]
<i>Student Life Regulations</i>	— [ 243 - 245 ]
<i>Student Activities and Organizations</i>	— [ 229 - 233 ]
<i>Scholastic Regulations</i>	— [ 246 - 251 ]
<i>Statistics</i>	— [ 252 - 253 ]
<i>Index</i>	— [ 254 - 255 ]
<i>Campus Map</i>	— [ 256 ]

COVER DRAWING:

*Architect's Sketch of the NEW DORMITORY COMPLEX*

CATALOG

*The University of Texas at El Paso*

MEMBER

SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS

TEXAS ASSOCIATION OF COLLEGES

TEXAS ASSOCIATION OF GRADUATE SCHOOLS

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BUSINESS

EDUCATION

ENGINEERING

LIBERAL ARTS

SCIENCES

GRADUATE STUDY

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*Published quarterly by* THE UNIVERSITY OF TEXAS AT EL PASO

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*Volume* LVI

OCTOBER - DECEMBER, 1970

*Number* 7004

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Second Class Postage Paid at El Paso, Texas

# CALENDAR FOR FALL SEMESTER — 1970

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	2	3	4	5					1	2	3	1	2	3	4	5	6	7			1	2	3	4	5
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14	6	7	8	9	10	11	12
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21	13	14	15	16	17	18	19
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28	20	21	22	23	24	25	26
27	28	29	30				25	26	27	28	29	30	31	29	30						27	28	29	30	31		

## AUGUST

10—*Monday*. Last day for new students to submit applications for admission to Fall Semester

## SEPTEMBER

- 2-4—*Wednesday through Friday*. Final freshman orientation.
- 8—*Tuesday*. New student convocation — Magoffin Auditorium, 9:00 A.M.
- 8—*Tuesday*. General Faculty Meeting — Magoffin Auditorium, 3:30 P.M.
- 8-11—*Tuesday through Friday*. Registration Activities.
- 14—*Monday*. Classes begin.
- 18—*Friday*. Last day for adding courses.

## NOVEMBER

- 3—*Tuesday*. Mid-semester reports.
- 6—*Friday*. Trans-Pecos Teachers Meeting — Classes dismissed.
- 14—*Saturday*. Homecoming.
- 17—*Tuesday*. Last day courses can be dropped without prior approval of the student's academic dean.
- 26-28—*Thursday through Saturday*. Thanksgiving Holidays.

## DECEMBER

- 9—*Wednesday*. Last day for new students to submit application for admission to Spring Semester.
- 21-January 2—*Monday through Saturday*. Christmas Vacation.

## JANUARY

# 1971

- 4—*Monday*. Classes resume.
- 11-19—*Monday through Tuesday*. Final examinations for first semester.
- 25—*Monday*. New student convocation — Magoffin Auditorium, 9:00 A.M.
- 25-26—*Monday and Tuesday*. New student orientation.
- 25-29—*Monday through Friday*. Registration Activities.

## FEBRUARY

- 1—*Monday*. Classes begin.
- 5—*Friday*. Last day for adding classes.

## MARCH

- 19—*Friday*. Mid-semester reports.

# CALENDAR FOR SPRING SEMESTER — 1971

**APRIL**

- 6—*Tuesday*. Last day courses can be dropped without prior approval of the student's academic dean.
- 7-12—*Wednesday through Monday inclusive*. Spring Vacation.

**MAY**

- 3—*Monday*. Last day for new students to submit applications for admission to Summer Session.
- 17-25—*Monday through Tuesday*. Final examinations for Second Semester.
- 29—*Saturday*. Commencement.



**SUMMER SESSION**

**JUNE**

- 1—*Tuesday*. New student orientation and convocation.  
Magoffin Auditorium 9:00 A.M.
- 2-July 13—**FIRST TERM**.
- 2—*Wednesday*. Registration Activities.
- 3—*Thursday*. Classes begin.

**JULY**

- 12-13—*Monday and Tuesday*. Final examinations for first term.
- 14-August 24—**SECOND TERM**.
- 14—*Wednesday*. Registration Activities.
- 15—*Thursday*. Classes begin.

**AUGUST**

- 23-24—*Monday and Tuesday*. Final examinations for second term.

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		1	2	3	4	5	6		1	2	3	4	5	6					1	2	3
3	4	5	6	7	8	9	7	8	9	10	11	12	13	7	8	9	10	11	12	13	4	5	6	7	8	9	10
10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20	11	12	13	14	15	16	17
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27	18	19	20	21	22	23	24
24	25	26	27	28	29	30	28							28	29	30	31				25	26	27	28	29	30	
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			1	2	3	4	5					1	2	3	1	2	3	4	5	6	7	
2	3	4	5	6	7	8	6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
9	10	11	12	13	14	15	13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
16	17	18	19	20	21	22	20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
23	24	25	26	27	28	29	27	28	29	30				25	26	27	28	29	30	31	29	30	31				
30	31																										

*Board of Regents of The University of Texas System*

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FRANK C. ERWIN, JR., *Chairman*

JACK S. JOSEY, *Vice-Chairman*

BETTY ANNE THEDFORD, *Secretary*

M E M B E R S

*Terms Expire 1971*

W. H. BAUER, Port Lavaca

JACK S. JOSEY, Houston

E. T. XIMENES, M.D., San Antonio

*Terms Expire 1973*

FRANK N. IKARD, Wichita Falls

JOE M. KILGORE, Austin

JOHN PEACE, San Antonio

*Terms Expire 1975*

FRANK C. ERWIN, JR., Austin

DAN C. WILLIAMS, Dallas

JENKINS GARRETT, Fort Worth

*Chancellor of The University of Texas System*

HARRY H. RANSOM, Ph.D.

# THE UNIVERSITY OF TEXAS AT EL PASO

## OFFICERS OF GENERAL ADMINISTRATION

- JOSEPH ROYALL SMILEY, *President*, 1958-60; 1969  
B.A., M.A., LL.D., Southern Methodist University;  
Ph.D., Columbia University; LL.D., University of Denver
- ROBERT MILTON LEECH, *Vice-President for Academic Affairs*, 1949  
B.F.A., M.F.A., Ph.D., The University of Texas at Austin
- MARSHALL LEE PENNINGTON, *Vice-President for Business Affairs*, 1936-49; 1969  
B.B.A., The University of Texas at Austin
- HALBERT GARVICE ST. CLAIR, *Business Manager*, 1960  
B.B.A., The University of Texas at Austin. Certified Public Accountant
- CLARENCE JOE CERVENKA, *Registrar and Director of Admissions*, 1952  
B.S., M.Ed., Texas A. & M. University
- BAXTER POLK, *University Librarian*, 1936  
B.A., Hardin-Simmons University; B.S. in L.S., University of Oklahoma;  
M.S. in L.S., Columbia University
- GEORGE COURTNEY MCCARTY, *Director of Athletics*, 1953  
B.S., M.A., New Mexico State University
- JIMMY REEVES WALKER, *Dean of Students*, 1958  
B.A., M.A., The University of Texas at El Paso;  
Ed.D., Oklahoma 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

- JOHN WOOLFORD MCFARLAND, *Dean*, 1966  
B.A., M.A., Ed.D., The University of Texas at Austin
- WILLIAM GERALD BARBER, *Assistant Dean*, 1967  
B.S., M.S., East Texas State University; Ed.D., University of Houston

### ENGINEERING

- DONALD PAUL KEDZIE, *Acting Dean*, 1967  
B.S., University of Houston; M.S., Ph.D., University of Wisconsin

### GRADUATE

- KENNETH EPHRIAM BEASLEY, *Dean*, 1967  
B.A., M.A., Ph.D., University of Kansas

### 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

- LEWIS FREDERIC HATCH, *Dean*, 1967  
B.S., Washington State University; M.S., Ph.D., Purdue University
- HAROLD EDWIN ALEXANDER, *Assistant Dean*, 1955  
B.S., The University of Texas at El Paso;  
M.A., Ph.D., The University of Texas at Austin

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Date indicates year of original appointment.

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**OTHER ADMINISTRATIVE OFFICERS AND STAFF**

- JAMES BYRON BACON, *Assistant to the President*, 1964  
B.S., M.A., The University of Texas at El Paso
- JACK BAKER, JR., *The Union Director*, 1969  
B.S., Oklahoma State University
- BARBARA DELL BLAIR, *Acquisitions Librarian*, 1958  
B.A., The University of Texas at El Paso; M.L.S., University of Washington
- CARY DONALD BROOKS, *Director of Institutional Studies*, 1968  
B.M.E., Millikin University; M.S.Ed., Ed.D., Indiana University
- WALLACE HAWN BRUCKER, *Head of Library Circulation Department*, 1967  
B.S., United States Military Academy
- RICHARD EVERETT CANFIELD, *Associate Business Manager*, 1966  
B.S., Centenary College of Louisiana
- THOMAS MILLER CHISM, *Director of Student Activities*, 1966  
B.A., Carson Newman College;  
B.D., Southwestern Baptist Theological Seminary; M.A., Phillips University
- EVERETT GEORGE DILLMAN, *Director of Bureau of Business and Economic Research*, 1968  
B.B.A., M.B.A., University of New Mexico;  
Ph.D., The University of Texas at Austin
- JESSE EDWARD DUGGAN, *Chief of Library Technical Services*, 1964  
B.A., M.L.S., The University of Texas at Austin
- 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
- YVONNE ETNYRE GREER, *Reference Librarian*, 1964  
B.F.A., M.L.S., The University of Texas at Austin
- EUGENE WENDELL GREEN, *Director of Personnel*, 1965  
B.S., University of Maryland; M.Litt. University of Pittsburgh
- LAWRENCE S. HAMILTON, *Assistant Dean of Students*, 1967  
B.A., New Mexico Highlands University; M.A., The University of Texas at El Paso; Ed.D., New Mexico State University
- CARL HERTZOG, *Director of Texas Western Press*, 1948  
Litt.D., Baylor University
- MARVIN RALPH HOLLENSHEAD, *Director of Physical Plant*, 1960  
B.A., Trinity University; M.A., The University of Texas at Austin
- BRYAN STEELE JONES, *Assistant to the President*, 1956  
B.A., University of Arkansas; M.A., The University of Texas at El Paso
- JOSEPH S. LAMBERT, *Director of Schellenger Research Laboratories*, 1966  
B.S.E.E., University of Pittsburgh;  
M.S.E.E., M.S. Physics; Ph.D., University of Michigan
- RALPH ANTHONY LIGUORI, *Assistant Dean of Students*, 1963  
B.S., University of New Mexico; M.A., University of Illinois
- JAMES TIMOTHY LINDOP, *Assistant Director of Admissions*, 1963  
B.A., The University of Texas at El Paso
- 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



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OFFICERS OF ADMINISTRATION

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- JUNE MARQUEZ, *Assistant to the Business Manager*, 1949
- LEON CLAIRE METZ, *University Archivist*, 1967
- HOWARD DUNCAN NEIGHBOR, *Director of the Social Science Research Center*, 1968  
B.S., M.S., Kansas State College; Ph.D., University of Kansas
- JANE WEYMAN PECK, *Supervisor of Health Service*, 1959  
R.N., University of Cincinnati School of Nursing and Health
- 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
- JOY MORGAN RILEY, *Executive Assistant to the President*, 1964
- ROBERT LOUIS SCHUMAKER, *Director of Computation Center*, 1946  
B.S., The University of Texas at El Paso; M.S., University of Arizona
- FRANK SCOTT, *Periodicals Librarian*, 1956  
B.B.A., The University of Texas at El Paso
- RICHARD SEBOK, *Director of Student Counseling Service*, 1968  
B.A., Millikin University; M.Ed., University of Illinois
- RAYMOND SHOWERY, *Surgical Consultant*, 1968  
B.A., The University of Texas at El Paso;  
M.D., The University of Texas Medical Branch at Galveston
- 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
- JOHNNY MACK STEWART, *Assistant Registrar*, 1969  
B.A., Eastern New Mexico University
- HENRY TENORIO, *Director of Intramurals*, 1969  
B.S., St. Benedict College; M.Ed., The University of Texas at El Paso
- GEORGE CAMBRIDGE TOMPKINS, *Director of Extension Service*, 1958  
B.S., M.S., University of Illinois
- DALE WALKER, *Director of News and Information*, 1966  
B.A., The University of Texas at El Paso
- EDWARD EARL WEIR, *Assistant to the University Librarian*, 1963

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RESIDENCE HALLS

- MR. and MRS. NELSON IRY, *Directors*, Burges Hall
- MRS. THELMA KARN, *Director*, Huspeth Hall
- MRS. AVIS MARIE HILL, *Director*, Benedict Hall
- MR. JAMES A. BLEVINS, *Director* Miners Hall
- MRS. MARY STUART, *Director*, Worrell Hall
- MRS. CECILE WALLER, *Director*, Bell Hall
- MRS. BEATRICE REBMAN, *Assistant Director*, Bell Hall

## 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. PATRICIA ADKINS, *Associate Professor of Drama and Speech*, 1965  
B.A., The University of Texas at El Paso; M.A., Texas Woman's University;  
Ph.D., University of Colorado
- 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
- 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
- ALBERT ARTHUR AMADOR, *Assistant Professor of Chemistry*, 1966  
B.A., University of New Mexico; Ph.D., New Mexico Highlands University
- EVAN HAYWOOD ANTONE, *Instructor in English*, 1967  
B.A., M.A., The University of Texas at El Paso;  
M.A., The University of California at Los Angeles
- MRS. JOANNA ARMSTRONG, *Associate Professor of Curriculum and Instruction*, 1968  
M.A., University of Utah; Ph.D., University of Houston
- JOHN CLEVELAND ARNOLD, *Assistant Professor of Art*, 1965  
B.A., University of Minnesota; M.F.A., Arizona State University
- GLORIA CABALLERO ASTAZARAN, *Assistant Professor of Modern Languages*, 1967  
B.A., M.A., Ph.D., University of Arizona
- 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
- FREDERICK HOMER BAILEY, *Assistant Professor of Mathematics*, 1963  
B.S., New Mexico State University; M.A., University of Colorado
- 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
- HOWARD WOOSTER BALDWIN, *Instructor in Modern Languages*, 1965  
B.S., Rutgers University; M.A., The University of Texas at El Paso
- WILLIAM GERALD BARBER, *Associate Professor of Curriculum and Instruction*, 1967  
B.S., M.S., East Texas State University; Ed.D., University of Houston
- MRS. MARIE ESMAN BARKER, *Instructor in Curriculum and Instruction*, 1968  
B.A., M.A., The University of Texas at El Paso
- THOMAS GROCARD BARNES, *Professor of Physics*, 1938  
B.A., ScD. (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
- CHARLES RICHARD BATH, *Assistant Professor of Political Science*, 1966  
B.A., University of Nevada; M.A., Tulane University
- ALLEN OSCAR BAYLOR, *Professor of Business*, 1965  
B.A., Licence en Droit et Economie Politique, American College, Teheran;  
Doctorat es 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 BENTZ, *Associate Professor of Mathematics*, 1952  
B.S., West Chester State College; M.Ed., Pennsylvania State University;  
Ph.D., George Peabody College
- ANTON HELMER BERKMAN, *Professor Emeritus of Biological Sciences*, 1927  
B.A., M.A., The University of Texas at Austin; Ph.D., University of Chicago
- 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
- SACHINDRANARAYAN BHADURI, *Associate Professor of Mechanical Engineering*, 1963  
B.M.E., Jadavpur 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
- MRS. SALLY MITCHELL BISHOP, *Instructor in 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
- EDWARD LEE BLANSITT, JR., *Associate Professor of English*, 1967  
Ph.D., The University of Texas at Austin
- 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
- TOMMY J. BOLEY, *Instructor in English*, 1967  
B.B.A., M.A., North Texas State University
- LANIS LOY BOSWORTH, *Associate Professor of Psychology*, 1950  
B.B.A., M.A., 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, *Associate 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
- 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
- RALPH CLEMENS BRIGGS, *Associate Professor of Music*, 1950  
B.M., M.M., Cincinnati Conservatory of Music
- JOHN MORGAN BROADDUS, JR., *Instructor in History*, 1954  
B.A., M.A., The University of Texas at El Paso
- MRS. BONNIE SUE BROOKS, *Assistant Professor of Educational Psychology and Guidance*, 1968  
B.M.E., Millikin University; M.S.Ed., Ed.D., Indiana University
- GARY DONALD BROOKS, *Assistant Professor of Educational Administration*, 1968  
B.M.E., Millikin University; M.S. Ed., Ed.D., Indiana University
- DENNIS LEE BROWN, *Assistant Professor of Curriculum and Instruction*, 1969  
B.A., University of Kansas; M.A., Indiana University

*The University of Texas at El Paso*

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- 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  
B.A., Sul Ross State University; Certified Public Accountant
- JOSEPH RANDALL BURCHARD, *Associate Professor of Accounting*, 1967  
B.A., Maryville College; Ph.D., University of Chicago
- WILLIAM ANO BURGETT, *Instructor in Mathematics*, 1958  
B.S., U. S. Naval Academy; M.S., Purdue University
- ALEXANDER BERNARD BURKE, JR., *Instructor in History*, 1969  
B.A., Boston College; M.A., Indiana University
- ROBERT NORTHCUTT BUBLINGAME, *Professor of English*, 1954  
B.A., M.A., University of New Mexico; Ph.D., Brown University
- LOU ELLA BURMEISTER, *Professor of Curriculum and Instruction*, 1968  
B.A., M.A., Ph.D., University of Wisconsin
- RICHARD WEBSTER BURNS, *Professor of Curriculum and Instruction*, 1952  
B.A., University of Northern Iowa; M.S., Ph.D., State University of Iowa
- PENNY MARGE BYRNE, *Instructor in Drama and Speech*, 1969  
B.A., M.A., The University of Texas at El Paso
- WILLIAM RALPH CABANESS, JR., *Associate Professor of Chemistry*, 1965  
B.A., M.A., Ph.D., The University of Texas at Austin
- HUGH FREDERICK CARDON, *Assistant Professor of Music*, 1963  
B.M., M.A., The University of Texas at El Paso
- THOMAS PELHAM CARTER, *Professor of Curriculum and Instruction and Sociology*, 1967  
B.A., The University of California at Riverside;  
Ph.D., The University of Texas at Austin
- AMELIA MENDEZ CASTILLO, *Instructor in Sociology*, 1969  
B.A., The University of Texas at El Paso;  
M.S.W., Our Lady of the Lake, Worden School of Social Science
- CLARENCE JOE CERVENKA, *Associate Professor of Engineering Graphics*, 1952  
B.S., M.Ed., Texas A. & M. University
- MRS. MARJORIE CERVENKA, *Instructor in English*, 1966  
B.A., M.A., The University of Texas at El Paso
- ROBERT NORDHAUS CHAPLIN, *Assistant Professor of Economics*, 1969  
B.S., University of New Mexico
- PETER STANLEY CHRAPLIWY, *Associate Professor of Biology*, 1960  
A.B., M.A., University of Kansas; Ph.D., University of Illinois
- CHESTER CARSEL CHRISTIAN, JR., *Associate professor of Modern Languages*, 1963  
B.A., M.A., The University of Texas at Austin; M.A., The University of Texas at El Paso; Ph.D., The University of Texas at Austin
- EDWARD CORNELL CLARK, *Assistant Professor of History*, 1969  
B.S., Massachusetts Institute of Technology; M.A., Ph.D., Princeton University
- MARION CLINE, JR., *Professor of Curriculum and Instruction*, 1962  
B.S., University of New Mexico; M.A., New Mexico Highlands University;  
Ed.D., University of Southern California
- EDMUND BENEDICT COLEMAN, *Professor of Psychology*, 1965  
B.S., University of South Carolina; M.A., Ph.D., Johns Hopkins University
- RALPH MONROE COLEMAN, *Professor of Engineering Graphics*, 1946  
B.S., M.S., North Texas State University
- MRS. MARY LILLIAN COLLINGWOOD, *Assistant Professor of English*, 1947  
B.A., The University of Texas at El Paso; M.A., University of Michigan
- BENNY WESLEY COLLINS, *Associate Professor of Health and Physical Education*, 1950  
B.A., The University of Texas at El Paso; M.S., University of Utah

- J. ROBERT COLTHARP, *Associate Professor of Civil Engineering*, 1961  
B.S., M.S., The University of Texas at Austin; Registered Professional Engineer
- MRS. LURLINE HUGHES COLTHARP, *Associate Professor of English*, 1954  
B.A., M.A., Ph.D., The University of Texas at Austin
- ELLEN WINIFRED COOGLER, *Assistant Professor of Art*, 1944  
B.S., Sul Ross State University; M.A., Teachers College Columbia University
- THOMAS IRA COOK, *H. Y. Benedict Professor of Political Science*, 1966  
B.S., London School of Economics; Ph.D., Columbia University
- CLARENCE HENRY COOPER, *Assistant Professor of Physics*, 1959  
B.S., The University of Texas at El Paso; M.S., Vanderbilt University
- MARY EDITH CORN, *Instructor in English*, 1967  
A.B., Southwest Missouri State College; A.M., University of Missouri at Columbia
- MRS. ELEANOR GREET COTTON, *Instructor in English*, 1960  
B.A., M.A., The University of Texas at El Paso
- MRS. KATHLEEN CRAIGO, *Assistant Professor of Health and Physical Education*, 1945  
B.A., M.A., North Texas State University
- CECIL CLEMENT CRAWFORD, *Professor Emeritus of Philosophy*, 1953  
B.A., M.A., Ph.D., Washington University
- JOHN KELLOGG CREIGHTON, *Associate Professor of History*, 1966  
B.A., M.A., Ph.D., University of Colorado
- DAVID HAROLD CROWLEY, *Instructor in Music*, 1968  
B.M., M.M., The Manhattan School of Music
- RALPH BORDEN CULP, *Professor of Drama and Speech*, 1965  
B.A., M.A., Southern Methodist University; Ph.D., Cornell University
- EUGENE LEE DANIEL, *Assistant Professor of Military Science*, 1969  
B.B.A., The University of Texas at El Paso, Captain, U. S. Army
- EVERETT EDWARD DAVIS, *Associate Professor of Educational Psychology and Guidance*, 1965  
B.A., University of Colorado; M.A., Colorado State Teachers College; Ph.D., Arizona State University
- JOAN HELEN DAVIS, *Assistant Professor of Modern Languages*, 1969  
B.A., University College of London; Ph.D., The University of Texas at Austin
- MICHAEL IAN DAVIS, *Associate Professor of Chemistry*, 1968  
B.S., The University of London; Ph.D., University of Oslo
- VELMA LOU DAVIS, *Assistant Professor of Curriculum and Instruction*, 1963  
B.S., New Mexico State University; M. Ed., University of the Philippines
- MRS. LOLA B. DAWKINS, *Professor of Business*, 1965  
B.B.A., The University of Texas at El Paso;  
M.B.A., Ph.D., The University of Texas at Austin
- MRS. GERTRUDE DAWSON, *Instructor in Business*, 1968  
B.A., M.A., The University of Texas at El Paso
- JAMES FRANCIS DAY, *Professor of Educational Psychology and Guidance*, 1955  
B.S., M.S., Utah State University; Ed.D., Stanford University
- JAMES MILTON DAY, *Associate Professor of English*, 1967  
B.A., M.A., The University of Texas at Austin; Ph.D., Baylor University
- EUGENE ALAN DEAN, *Associate Professor of Physics*, 1958  
B.S., The University of Texas at El Paso; M.S., New Mexico State University; Ph.D., Texas A. & M. University
- MRS. ANA MARIA V. DE NAVAR, *Instructor in Modern Languages*, 1965  
B.S., M.S., Universidad Nacional Autónoma de México;  
M.A., The University of Texas at El Paso
- ALLEN EDWARD DEPAGTER, *Associate Professor of Art*, 1967  
B.F.A., M.F.A., Texas Christian University;  
Ph.D., The University of Texas at Austin

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- GASTON ROSAIRE DES HARNAIS, *Instructor in English*, 1969  
B.A., Sacred Heart Seminary College; M.A., University of Detroit
- JAMES VINCENT DEVINE, *Assistant Professor of Psychology*, 1967  
B.S., M.S., University of New Mexico; Ph.D., Kansas State University
- EVERETT GEORGE DILLMAN, *Associate Professor of Business*, 1968  
B.B.A., M.B.A., University of New Mexico;  
Ph.D., The University of Texas at Austin
- ROBERT MCPHAIL DILLON, *Assistant Professor of Military Science*, 1968  
B.S., Texas A. & M. University, Captain, U. S. Army
- WILLIAM JAMES DODGE, *Assistant Professor of Mathematics*, 1969  
B.S., M.S., University of Wisconsin
- JACK ALLEN DOWDY, *Associate Professor of Mechanical Engineering*, 1964  
A.A., Wharton Jr. College; B.S.M.E., Southern Methodist University;  
M.S.M.E., Oklahoma State University; Ph.D., The University of Texas at Austin
- MRS. MARY ELEANOR DUKE, *Associate Professor of Biology*, 1947  
B.A., The University of Texas at El Paso;  
M.A., Ph.D., The University of Texas at Austin
- PHILIP DURIEZ, *Associate Professor of Economics*, 1962  
B.A., New Mexico Western College; M.A., Baylor University;  
Ph.D., Louisiana State University
- KENNETH SCOTT EDWARDS, *Professor of Mechanical Engineering*, 1965  
B.M.E., Cornell University; M.A.E., Yale University; Ph.D., Cornell University
- FRANCIS ALAN EHMANN, *Assistant Professor of English*, 1950  
B.A., The University of Texas at El Paso; M.A., Harvard University
- HENRY PHILIP EHRLINGER, *Associate Professor of Metallurgical Engineering*, 1959  
B.S., E.M., University of Wisconsin; Registered Professional Engineer
- OLAV ELLING EIDBO, *Professor of Music*, 1950  
B.A., Concordia College; M.A., The University of Texas at El Paso;  
Ph.D., University of North Dakota
- CURTIS EINAR EKLUND, *Associate Professor of Biology*, 1966  
B.A., M.A., Ph.D., The University of Texas at Austin
- ELDON EDWARD EKWALD, *Associate Professor of Curriculum and Instruction*, 1969  
B.S., M.Ed., University of Nebraska; Ed.D., University of Arizona
- CHARLES GAYLORD ELERICK, *Instructor in English*, 1968  
B.A., University of New Mexico; M.A., The University of Texas at El Paso
- MRS. JOANNE TONTZ ELLZEY, *Assistant Professor of Biology*, 1969  
B.A., Randolph-Macon Woman's College; M.A., University of North Carolina;  
Ph.D., The University of Texas at Austin
- MARION LAWRENCE ELLZEY, JR., *Assistant Professor of Mathematics*, 1968  
B.A., Rice University; Ph.D., The University of Texas at Austin
- ROBERT MORLEY ESCH, *Instructor in English*, 1965  
B.A., Southern Methodist University; M.A., The University of Wisconsin
- MRS. PATRICIA MOORE ESSLINGER, *Assistant Professor of English*, 1969  
B.A., M.A., Rice University; Ph.D., Tulane University
- MRS. BILLIE WALKER ETHERIDGE, *Instructor in English*, 1968  
B.S., University of Houston; M.A., The University of Texas at El Paso
- CHARLES LARIMORE ETHERIDGE, SR., *Assistant Professor of Drama and Speech*, 1963  
B.S., M.A., Sul Ross State University
- BRUCE MAX EVANS, *Assistant Professor of Curriculum and Instruction*, 1968  
B.S., M.Ed., Abilene Christian College; Ed.D., Texas Tech University
- RALPH WALDO EWTON, JR., *Associate Professor of Modern Languages*, 1966  
B.A., M.A., Ph.D., Rice University
- FLOYD EMMETT FARQUEAR, *Professor Emeritus of Education*, 1942  
B.S., Miami University; M.A., University of Chicago;  
Ed.D., The University of Texas at Austin

FACULTY

- DONALD NATHANAEEL FARRER, *Adjunct Professor of Psychology*, 1969  
B.A., M.S., San Jose State College; Ph.D., Washington State University
- PAUL EDWARD FENLON, *Professor of Economics and Finance*, 1967  
B.S., College of the Holy Cross; A.B., University of Illinois;  
M.A., Ph.D., University of Florida
- JOE WARREN FITZPATRICK, *Assistant Professor of Mathematics*, 1966  
B.S., Baylor University; M.A., The University of Texas at Austin
- MRS. JANIE RUTH FLYNT, *Assistant Professor of Accounting*, 1966  
B.B.A., The University of Texas at El Paso; M.B.A., Texas Tech University; C.P.A.
- ALONZO NEIL FOSTER, *Professor of Educational Administration*, 1951  
B.S., Southwest Texas State University; M.A., University of Missouri at Columbia;  
Ed.D., Colorado State College
- REX ELWYN FOX, *Assistant Professor of Mathematics*, 1961  
B.S., Texas A. & M. University; M.Ed., Southwest Texas State University;  
M.A., Louisiana State University
- DONALD ROBERT FRASER, *Assistant Professor of Economics and Finance*, 1969  
B.A., University of Arizona; M.S., University of Rhode Island;  
Ph.D., University of Arizona
- DONALD KEITH FREELAND, *Assistant Professor of Business*, 1949  
B.S., Austin College; M.B.A., North Texas State University
- CHARLES EDWARD FREEMAN, JR., *Assistant Professor of Biology*, 1968  
B.S., Abilene Christian College; M.S., Ph.D., New Mexico State University
- CHARLES MORTON FRUITHANDLER, *Assistant Professor of Accounting*, 1968  
B.A., University of Pennsylvania; J.D., Brooklyn Law School
- WAYNE EDISON FULLER, *Professor of History*, 1955  
B.A., University of Colorado; M.A., University of Denver;  
Ph.D., University of California at Berkeley
- CLARKE HENDERSON GARNSEY, *Professor of Art*, 1966  
B.S., M.S., Ph.D., Western Reserve University
- EDWARD YOUSSEF GEORGE, *Professor of Business*, 1969  
B.A., American University at Cairo; B.S., M.A., Cairo University;  
Ph.D., New School for Social Research
- REX ERVIN GERALD, *Assistant Professor of Sociology*, 1958  
B.A., University of Arizona; M.A., University of Pennsylvania
- WALTER LOUIS GEYER, *Instructor in Music*, 1967  
B.M., The University of Texas at Austin; M.M., University of Michigan
- GLENN ALLEN GIBSON, *Associate Professor of Electrical Engineering*, 1966  
B.S.E.E., University of Kansas; M.S.E.E., M.A., Ph.D., Arizona State University
- LAURENCE AREY GIBSON, *Assistant Professor of Music*, 1969  
B.M., M.M., Eastman School of Music
- ARTHUR SHOLLEY GIFFORD, *Assistant Professor of Business*, 1967  
B.S., M.B.A., University of Arkansas
- CHARLES HERMAN GLADMAN, *Associate Professor of Mathematics*, 1948  
B.S., M.A., Ohio State University
- MRS. LYNETTE GLARDON, *Assistant Professor of Health and Physical Education*, 1951  
B.A., M.A., The University of Texas at El Paso
- ROSE GOBEL, *Instructor in Curriculum and Instruction*, 1968  
B.A., St. Francis College; M.A., De Paul University
- JUDITH PAGE GOGGIN, *Associate Professor of Psychology*, 1969  
B.A., Bryn Mawr; Ph.D., University of California at Berkeley
- BERNARD ALLEN GOLDBERG, *Instructor in English*, 1967  
B.S., The University of Texas at Austin; M.A., The University of Texas at El Paso
- PAUL WERSHUB GOODMAN, *Associate Professor of Sociology*, 1957  
B.A., M.S., Syracuse University; Ph.D., University of Colorado

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- E. WILLIAM GOULD, JR., *Assistant Professor of Drama and Speech*, 1964  
B.A., University of Connecticut; M.F.A., Ohio University
- JOSEPH BENJAMIN GRAVES, *Associate Professor of Political Science*, 1964  
B.A., J.D., Vanderbilt University; M.P.A., Harvard University
- THOMAS AARON GREEN, JR., *Instructor in English*, 1969  
B.A., M.A., The University of Texas at Austin
- PAUL ELMER GROSSER, *Assistant Professor of Political Science*, 1966  
B.S., Cannon College; M.S. Ph.D., Pennsylvania State University
- JOHN HERBERT HADDOX, *Professor of Philosophy*, 1957  
B.A., M.A., Ph.D., University of Notre Dame
- CARL ELDRIDGE HALL, *Associate Professor of Mathematics*, 1969  
B.S., West Texas State University; M.S., Ph.D., New Mexico State University
- DAVID LYNN HALL, *Assistant Professor of Philosophy*, 1969  
B.A., The University of Texas at El Paso;  
B.D., Chicago Theological Seminary; Ph.D., Yale University
- JAMES EDWIN HAMBY, JR., *Instructor in Sociology*, 1968  
B.A., M.A., University of Florida
- LAWRENCE S. HAMILTON, *Assistant Professor of Educational Psychology and Guidance*, 1967  
B.A., New Mexico Highlands University; M.A., The University of Texas at El Paso;  
Ed.D., New Mexico State University
- JESSE APLEY HANCOCK, *Professor of Chemistry*, 1941  
B.S., M.S., Gonzaga University; Ph.D., University of Colorado
- JULE ANN HANSEN, *Instructor in Mathematics*, 1961  
B.S., University of Wisconsin
- DONALD HOWARD HARDIN, *Associate Professor of Health and Physical Education*, 1962  
B.A., M.A., University of Northern Iowa; Ph.D., State University of Iowa
- HAROLD FRIEND HARDING, *H. Y. Benedict Professor of Speech*, 1966  
A.B., L.H.D., Hamilton College; M.A., Ph.D., Cornell University
- ARTHUR HORNE HARRIS, *Associate Professor of Biology*, 1965  
B.A., M.A., Ph.D., University of New Mexico
- WILLIAM HAROLD HARRIS, *Associate Professor of Health and Physical Education*, 1963  
B.S., M.E., University of Missouri at Columbia; M.A., Columbia University;  
Ed.D., University of Kentucky
- WILTZ HARRISON, *Professor of Art*, 1948  
B.A., The University of Texas at El Paso; M.A., University of Denver
- WADE JAMES HARTRICK, *Professor of Business*, 1944  
B.A., Texas Tech University; M.B.A., Ph.D., The University of Texas at Austin
- PAUL CLIFFORD HASSLER, JR., *Professor of Civil Engineering*, 1948  
B.S., Grove City College; M.S., University of New Mexico.  
Registered Professional Engineer
- LEWIS FREDERIC HATCH, *Professor of Chemistry*, 1967  
B.S., Washington State University; M.S., Ph.D., Purdue University
- LINDA ELIZABETH HAUGHTON, *Assistant Professor of Modern Languages*, 1962  
B.A., The University of Texas at El Paso; M.A., University of Arizona
- WILLIAM GARTH HENDERSON, *Professor of Civil Engineering*, 1965  
B.S.C.E., M.S.C.E., University of Oklahoma; Ph.D., Oklahoma State University
- MRS. MARY FRANCES BAKER HERNANDEZ, *Assistant Professor of English*, 1967  
B.S., M.S., Purdue University; M.A., Ph.D., University of New Mexico
- NORMA GONZALEZ HERNANDEZ, *Assistant Professor of Curriculum and Instruction*, 1969  
B.A., The University of Texas at El Paso;  
M.A., Ph.D., The University of Texas at Austin
- MRS. JULIA HERRERA, *Instructor in Modern Languages*, 1966  
B.A., The University of Texas at El Paso



- CARL HERTZOG, *Special Lecturer*, 1948  
Litt. D., Baylor University
- ROBERT SMITH HIATT, *Associate Professor of Sociology*, 1968  
A.B., Washington University; M.S.W., University of Denver;  
D.S.W., Columbia University
- VIRGIL HICKS, *Professor of Radio and Television*, 1945  
B.A., The University of Texas at El Paso; M.A., University of Southern California
- JOHN MOORE HILLS, *Professor of Geology*, 1967  
B.S., Lafayette College; Ph.D., University of Chicago
- HAROLD L. HILLYER, *Associate Professor of Music*, 1962  
B.M.E., University of Wichita; M.M., University of Southern California
- PHILIP HIMELSTEIN, *Professor of Psychology*, 1965  
B.A., M.A., New York University; Ph.D., The University of Texas at Austin
- JERRY MARTIN HOFFER, *Associate Professor of Geology*, 1965  
B.A., M.A., State University of Iowa; Ph.D., Washington State University
- ERNEST HOWARD HOLT, *Adjunct Professor of Electrical Engineering*, 1969  
B.S., Ph.D., University of London. Registered Professional Engineer
- JOHN JOSEPH HOOKER, *Associate Professor of Economics and Finance*, 1968  
B.A., M.A., Cambridge University;  
B.Sc., M.Sc., B.Com., Ph.D., University of London
- JOHN ANTHONY HOVEL, JR., *Assistant Professor of Political Science*, 1958  
B.A., M.A., University of Wisconsin
- JERRY DON HUNTER, *Associate Professor of Biology*, 1966  
M.A., Hardin-Simmons University; M.S., Ph.D., Texas A. & M. University
- LAWRENCE HUNTLEY, *Assistant Professor of Mathematics*, 1964  
B.A., M.A., Kansas State Teachers College
- MRS. ILSE HEDWIG IRWIN, *Instructor in Modern Languages*, 1965  
B.A., Kansas University; M.A., University of Colorado
- PHILIP EDWARD ISETT, *Instructor in History*, 1967  
B.A., M.A., The University of Texas at Austin
- JEROME M. ISRAEL, *Assistant Professor of History*, 1968  
B.A., New York University; M.A., University of Michigan;  
Ph.D., Rutgers University
- CARL THOMAS JACKSON, *Associate Professor of History*, 1962  
A.B., University of New Mexico; Ph.D., University of California at Los Angeles
- HOWARD MONFORD JACKSON, *Instructor in Geology*, 1963  
B.S., The University of Texas at El Paso
- DILMUS DELANO JAMES, *Assistant Professor of Economics*, 1958  
B.A., M.A., The University of Texas at Austin
- JOSEPH HOPKINS JAMES, *Associate Professor of English*, 1938  
B.A., M.A., University of Alabama
- LOREN GENE JANZEN, *Instructor in Art*, 1967  
B.F.A., M.F.A., Wichita State University
- MRS. EUGENIA SPROUL JOHNSON, *Instructor in Modern Languages*, 1968  
B.A., Trinity University; M.A., Instituto Tecnológico de Monterrey
- MRS. CLARICE MATTHEWS JONES, *Assistant Professor of Drama and Speech*, 1946  
B.S., West Texas State University; M.A., Texas Woman's University
- STEPHEN JUSTICE, *Instructor in English*, 1962  
B.A., M.A., North Texas State University
- YASUhide KAWASHIMA, *Assistant Professor of History*, 1966  
LL.B., LL.M., Keio University, Japan;  
B.A., M.A., Ph.D., University of California at Santa Barbara
- DONALD PAUL KEDZIE, *Professor of Metallurgical Engineering*, 1967  
B.S., University of Houston; M.S., Ph.D., University of Wisconsin

The University of Texas at El Paso

- BRIAN JOHN KELLY, *Assistant Professor of Health and Physical Education*, 1968  
Dip. P.E., University of New Zealand at Denedin;  
M.Ed., Western Washington State College; Ph.D., University of Oregon
- MRS. NOELINE LILLIAS KELLY, *Visiting Assistant Professor of Health and Physical Education*, 1969  
B.Ed., University of British Columbia; M.S., University of Oregon
- CAROLYN KENNESON, *Instructor in Music*, 1964  
B.M., North Texas State University; M.M., The University of Texas at Austin
- MRS. PAULINE KISKA, *Instructor in English*, 1966  
A.B., Bradley University; M.A., The University of Texas at El Paso
- KARL WALTER KLEMENT, *Professor of Geology*, 1969  
Ph.D., Tübingen
- EDWIN JOHN KNAPP, *Professor Emeritus of Physics*, 1931  
Ph.B., Ph.D., University of Wisconsin
- OLIVER HOLMES KNIGHT, JR., *Professor of History*, 1967  
B.A., M.A., University of Oklahoma; Ph.D., University of Wisconsin
- JULIUS OTTO KOPPLIN, *Professor of Electrical Engineering*, 1968  
B.S.E.E., University of Wisconsin; M.S.E.E., Ph.D., Purdue University
- CARL FREDERICK KRAENZEL, *H. Y. Benedict Professor of Sociology*, 1968  
B.A., University of North Dakota; M.A., University of Minnesota;  
Ph.D., University of Wisconsin
- DANICE MAE KRESS, *Instructor in Music*, 1967  
B.M., The University of Texas at El Paso
- ORVILLE CLEON KRUSCHWITZ, *Assistant Professor of Mathematics*, 1956  
A.B., Ohio Wesleyan University; M.A., George Peabody College for Teachers
- Z. ANTHONY KRUSZEWSKI, *Assistant Professor of Political Science*, 1968  
Baccalauréat, Lycée, Cawthorne, England; Ph.D., University of Chicago
- EUGENE KUZIRIAN, *Assistant Professor of History*, 1967  
A.B., University of California at Berkeley; M.A., Fresno State College;  
Ph.D., Rutgers University
- WILLIAM ROBERT LACEY, *Assistant Professor of English*, 1966  
B.S., M.A., Mississippi State University; Ph.D., Louisiana State University
- JOSEPH S. LAMBERT, *Professor of Electrical Engineering*, 1966  
B.S.E.E., University of Pittsburgh; M.S.E.E., M.S., Physics;  
Ph.D., University of Michigan
- JACK PORTER LANDRUM, *Assistant Professor of Educational Psychology and Guidance*, 1966  
B.S., Stanford University; M.S., Ed.D., The University of Texas at Austin
- RICHARD LINO LANDY, *Instructor in Modern Languages*, 1969  
B.A., M.A., The University of Texas at El Paso
- RICHARD LEO LANIGAN, JR., *Assistant Professor of Drama and Speech*, 1969  
B.A., M.A., University of New Mexico; Ph.D., Southern Illinois University
- MRS. GWENDOLYN HAGLER LAWRENCE, *Instructor in Curriculum and Instruction*, 1967  
B.S., M.A., The University of Texas at El Paso
- JUAN OTTO LAWSON, *Assistant Professor of Physics*, 1967  
B.S., Virginia State College; M.S., Ph.D., Howard University
- MRS. MARJORIE PAYTON LAWSON, *Instructor in English*, 1966  
B.A., M.A., Howard University
- JOSEPH LEE LEACH, *Professor of English*, 1947  
B.A., Southern Methodist University; Ph.D., Yale University
- WILLIAM JOSEPH LEAHEY, *Professor of Mathematics*, 1968  
S.B., S.M., Ph.D., Massachusetts Institute of Technology
- ROBERT MILTON LEECH, *Professor of Drama and Speech*, 1949  
B.F.A., M.F.A., Ph.D., The University of Texas at Austin

- DAVID VONDENBURG LEMONE, *Associate Professor of Geology*, 1964  
B.S., New Mexico Institute of Mining and Technology;  
M.S., University of Arizona; Ph.D., Michigan State University
- EDWARD ALMAND LEONARD, *Associate Professor of Political Science*, 1965  
B.A., Oglethorpe University; M.A., Ph.D., Emory University
- LEONARD SIDNEY LEVITT, *Professor of Chemistry*, 1965  
B.S., Pennsylvania State University; B.A., University of Pennsylvania;  
M.A., Haverford College; Ph.D., Temple University
- JOHN MELVIN LEVOSKY, *Associate Professor of Mechanical Engineering*, 1967  
B.S., Lamar State College; M.S., Ph.D., Oklahoma State University
- RALPH A. LIGUORI, *Assistant Professor of Mathematics*, 1963  
B.S., University of New Mexico; M.A., University of Illinois
- WINSTON DALE LLOYD, *Associate Professor of Chemistry*, 1962  
B.S., Florida State University; Ph.D., University of Washington
- MRS. MONA H. LOPER, *Assistant Professor of Health and Physical Education*, 1957  
B.S., Texas Christian University
- KENNITH WAYNE LOPP, *Assistant Professor of Mathematics*, 1968  
B.S., M.S., New Mexico State University
- EARL MARK P. LOVEJOY, *Associate Professor of Geology*, 1965  
B.S., Rutgers University; M.S., Colorado School of Mines;  
Ph.D., University of Arizona
- MRS. FRANCES EDMANDS LOWRANCE, *Assistant Professor of Curriculum and Instruction*, 1963  
A.B., Indiana University; M.Ed., Texas Tech University
- WILLIAM GLASGOW LUCKER, *Assistant Professor of Psychology*, 1967  
B.A., The University of Texas at El Paso
- LARRY MACDONALD, *Assistant Professor of Accounting*, 1969  
B.B.A., The University of Texas at El Paso; M.A., Brigham Young University;  
Ph.D., University of Utah
- DENNIS FRANCIS MACEK, *Instructor in English*, 1966  
B.A., Marquette University; M.A., University of Arizona
- MRS. ELIZABETH CHYMES MANNING, *Assistant Professor of Biology*, 1960  
B.S., M.A., The University of Texas at Austin
- RALPH MARTINEZ, *Instructor in Electrical Engineering*, 1969  
B.S.E.E., M.S.E.E., The University of Texas at El Paso
- BERNARD MARTIN-WILLIAMS, *Assistant Professor of Mathematics*, 1967  
B.A., M.A., Cambridge University
- ROBERT JOSEPH MASSEY, *Professor of Art*, 1953  
B.A., Oklahoma State University; M.F.A., Syracuse University;  
Ph.D., The University of Texas at Austin
- GERALD GARDNER MAXWELL, *Assistant Professor of Mechanical Engineering*, 1966  
B.S., M.S., The University of Texas at El Paso
- WILLIAM NOEL MCANULTY, *Professor of Geology*, 1964  
B.S., M.S., University of Oklahoma; Ph.D., The University of Texas at Austin
- GEORGE COURTNEY MCCARTY, *Associate Professor of Health and Physical Education*, 1953  
B.S., M.A., New Mexico State University
- CARLOS MACDONALD, *Assistant Professor of Engineering*, 1958  
B.S., The University of Texas at El Paso; M.S., New Mexico State University
- ROBERT CLARENCE McDONALD, JR., *Instructor in Mathematics*, 1963  
B.S., United States Military Academy; M.S., University of Southern California
- JOHN WOOLFORD MCFARLAND, *Professor of Educational Administration*, 1966  
B.A., M.A., Ed.D., The University of Texas at Austin
- ROBERT GERALD MCINTYRE, *Professor of Mathematics*, 1965  
B.S., U. S. Naval Academy; Ph.D., University of Oklahoma

*The University of Texas at El Paso*

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- OSCAR HARRY MCMAHAN, *Professor of Physics*, 1943  
B.S., Oklahoma State University; M.S., University of Arizona
- JOHN HAMILTON MCNEELY, *Professor of History*, 1946  
B.A., American University; M.A., George Washington University;  
Ph.D., The University of Texas at Austin
- PATRICK HAYES MCNAMARA, *Assistant Professor of Sociology*, 1968  
B.A., M.A., St. Louis University; M.A., Loyola University of Chicago;  
Ph.D., University of California at Los Angeles
- JACK HOUSTON MEADOWS, *Professor of Educational Administration*, 1954  
B.S., M.A., Sam Houston State University; Ed.D., Texas Tech University
- ARTIE LOU METCALF, *Associate Professor of Biology*, 1962  
B.S., Kansas State University; M.A., Ph.D., University of Kansas
- MRS. JEAN HEININGER MICULKA, *Assistant Professor of Drama and Speech*, 1961  
B.A., The University of Texas at El Paso; M.A., Northwestern University
- VLADIK ADOLPH MICULKA, *Assistant Professor of Mathematics*, 1955  
B.S., Southwest Texas State University; M.S., Texas Tech University
- JOHN JUDY MIDDAGH, *Professor of Journalism*, 1948  
B.J., University of Missouri at Columbia; M.A., The University of Texas at El Paso
- GEORGE EDISON MILLER, *Assistant Professor of Curriculum and Instruction*, 1967  
B.A., B.S., M.Ed., The University of Texas at El Paso
- GERALD REUBUSH MILLER, *Associate Professor of Psychology*, 1965  
B.A., Ph.D., Johns Hopkins University
- ROSS MOORE, *Instructor in Health and Physical Education*, 1940  
B.A., The University of Texas at El Paso
- JAMES KENNETH MORTENSEN, *Assistant Professor of English*, 1966  
B.A., M.A., University of Minnesota; Ph.D., University of New Mexico
- MRS. FLORENCE WAYMOUTH MUNN, *Instructor in Curriculum and Instruction*, 1964  
B.A., M.A., The University of Texas at Austin
- JACKSON LEE MUNSEY, *Assistant Professor of Military Science*, 1969  
B.S., United States Military Academy; Major, U. S. Army
- HOWARD DUNCAN NEIGHBOR, *Associate Professor of Political Science*, 1968  
B.S., M.S., Kansas State University; Ph.D., University of Kansas
- WELDON CLINTON NEILL, *Assistant Professor of Economics and Finance*, 1966  
B.A., M.A., The University of Texas at Austin
- CHARLES WILLIAM NEVILLE, *Assistant Professor of Mathematics*, 1969  
B.S., Yale University; M.S., University of Illinois
- CLYDE RUSSELL NICHOLS, *Professor of Electrical Engineering*, 1961  
B.S.E.E., M.S.E.E., Texas A. & M. University  
Registered Professional Engineer
- JAMES EUGENE NYMANN, *Associate Professor of Mathematics*, 1967  
B.A., University of Northern Iowa; M.S., Ph.D., University of Arizona
- HONG-SIOE OEY, *Assistant Professor of Civil Engineering*, 1967  
B.C.E., Bandung Institute of Technology, Indonesia;  
M.C.E., Ph.D., University of Oklahoma
- JACOB ORNSTEIN, *Professor of Modern Languages*, 1968  
B.S., M.A., Ohio State University; Ph.D., University of Wisconsin
- ALFREDO ORTEGA, *Instructor in Modern Languages*, 1967  
B.A., M.A., The University of Texas at El Paso
- CYRIL PARKANYI, *Visiting Associate Professor of Chemistry*, 1969  
M.S., R.N.Dr., Charles University, Prague;  
Ph.D., Czechoslovak Academy of Sciences, Prague
- RAYMOND EDGAR PAST, *Professor of English*, 1952  
A.B., University of Pennsylvania; M.A., Ph.D., The University of Texas at Austin
- JOHN GILLIS PATE, JR., *Associate Professor of Accounting*, 1969  
B.S., M.S., Florida State University; Ph.D., Columbia University

- ARRYL STANTON PAUL, JR., *Assistant Professor of Music*, 1966  
B.M., Drury College; M.M., Wichita University
- LUIS PEREZ, *Instructor in Journalism*, 1966  
B.A., The University of Texas at El Paso
- ROBERT LOUIS PETERSON, *Associate Professor of Political Science*, 1967  
B.A., M.A., State University of Iowa; Ph.D., Pennsylvania State University
- JESSE FREDERICK PICKRELL, *Professor of Business*, 1968  
B.B.A., M.B.A., North Texas State University;  
Ph.D., University of Pennsylvania; C.P.C.U.; C.L.U.
- JOSEPH HENRY PIERLUISSI, *Assistant Professor of Electrical Engineering*, 1969  
B.S.E.E., University of Puerto Rico; M.S.E.E., Cornell University;  
Ph.D., Texas A. & M. University
- EUGENE OLIVER PORTER, *Professor Emeritus of History*, 1940  
B.A., Ohio Wesleyan College; M.A., Ph.D., Ohio State University
- JOHN POTEET, *Assistant Professor of Health and Physical Education*, 1967  
B.S., M.S., Baylor University
- KEITH BURNS PRATER, *Assistant Professor of Chemistry*, 1969  
B.A., University of Kansas; Ph.D., The University of Texas at Austin
- NADINE HALE PRESTWOOD, *Instructor in Educational Psychology and Guidance*, 1966  
B.A., M.A., M.Ed., The University of Texas at El Paso
- JESUS ROBERTO PROVENCIO, *Assistant Professor of Physics and Mathematics*, 1966  
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
- CHARLES ALEXANDER PUCKETT, *Professor Emeritus of Education*, 1927  
B.A., The University of Texas at Austin; M.A., Harvard University
- MRS. JOAN PHELAN QUARM, *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
- JOSEPH MALCHUS RAY, *H. Y. Benedict Professor of Political Science,  
President Emeritus*, 1960  
B.A., M.A., Ph.D., The University of Texas at Austin
- JAMES BLANCHETTE REEVES, *Professor of Biology*, 1955  
B.S., M.S., Louisiana State University; Ph.D., The University of Texas at Austin
- MRS. LOUISE FLETCHER RESLEY, *Assistant Professor of Mathematics*, 1940  
B.A., The University of Texas at El Paso; M.A., The University of Texas at Austin
- MRS. FRANCES HOLMSLEY RICE, *Instructor in Curriculum and Instruction*, 1969  
B.A., M.Ed., The University of Texas at El Paso
- JOHN MARVIN RICHARDS, *Professor of Economics*, 1962  
B.A., University of Kansas; M.S., Kansas State Teachers College, Emporia;  
Ph.D., Louisiana State University
- ROBERT EDWARD RICHESON, JR., *Associate Professor of English*, 1962  
B.A., M.A., University of Virginia; Ph.D., Boston University
- JOSEPH CHARLES RINTELEN, JR., *Professor of Metallurgical Engineering*, 1949  
B.S., Brooklyn Polytechnic Institute; M.S., Cornell University;  
Ph.D., Duke University
- WILLIAM HENRY RIVERA, *Associate Professor of Chemistry*, 1962  
B.S., Ph.D., University of Louisville
- JUDITH RIVERA-RODRIGUEZ, *Assistant Professor of Modern Languages*, 1968  
B.A., University of Puerto Rico; M.A., The University of Texas at El Paso;  
M.A., Arizona State University
- FRANK EARL RIZZO, *Associate Professor of Metallurgical Engineering*, 1968  
B.Ch.E., University of Detroit; M.S., Ph.D., University of Cincinnati

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- GORDON WESLEY ROBERTSTAD, *Professor of Biology*, 1968  
B.S., M.S., University of Wisconsin; Ph.D., Colorado State University
- FERMIN RODRIGUEZ, *Assistant Professor of Modern Languages*, 1965  
B.A., Colorado State College; M.A., The University of Texas at El Paso
- JULIAN BAKER ROEBUCK, *Professor of Sociology*, 1965  
B.A., Atlantic Christian College; M.A., Duke University;  
Ph.D., University of Maryland
- BRUNO JOHN ROLAK, *Assistant Professor of History*, 1966  
B.S., M.A., Ph.D., Indiana University
- PATRICK ROMANELL, *H. Y. Benedict Professor of Philosophy*, 1965  
B.A., Brooklyn College; M.A., Ph.D., Columbia University
- ALBERT CHARLES RONKE, *Assistant Professor of Drama and Speech*, 1966  
B.A., M.A., Bowling Green State University
- WALTER RAY ROSER, *Associate Professor of Metallurgical Engineering*, 1966  
B.S., The University of Texas at El Paso;  
M.S., University of California at Berkeley; Ph.D., University of Arizona
- WILLIAM M. ROSS, *Instructor in Electrical Engineering*, 1966  
B.S.E.E., The University of Texas at El Paso
- DAVID BERNARD ROZENDAL, *Associate Professor of Civil Engineering*, 1960  
B.S., South Dakota School of Mines and Technology; M.S., University of Minnesota
- EDGAR THOMAS RUFF, *Professor of Modern Languages*, 1945  
B.A., M.A., Northwestern University; Ph.D., The University of Texas at Austin
- WILLIAM MAURICE RUSSELL, *Associate Professor of Modern Languages*, 1964  
A.B., Birmingham-Southern College; M.A., Ph.D., University of North Carolina
- WILFRID FEW RYLANDER, *Assistant Professor of Accounting*, 1968  
B.B.A., M.B.A., Ph.D., The University of Texas at Austin
- EDWARD JOHN SANDERS, *Assistant Professor of Accounting*, 1963  
B.C.S., Drake University; M.S., Texas A. and I. University; C.P.A.
- JOHN PAUL SCARBROUGH, *Associate Professor of Curriculum and Instruction*, 1964  
B.A., New Mexico Highlands University; Ed.D., University of New Mexico
- ROBERT HOWARD SCHMIDT, JR., *Assistant Professor of Geology*, 1969  
B.S., M.S., Oregon State University; Ph.D., University of California at Los Angeles
- ROBERT LOUIS SCHUMAKER, *Associate Professor of Physics*, 1946  
B.S., The University of Texas at El Paso; M.S., University of Arizona
- MRS. EMMA GUERRA SCRUGGS, *Assistant Professor of Modern Languages*, 1962  
Dra. en Filosofía y Letras, Dra. en Pedagogía, Universidad de Havana
- JOSEPH WALLACE SCRUGGS, *Assistant Professor of Chemistry*, 1946  
B.S., Texas A. & M. University;  
M.A., The University of Texas at Austin
- MRS. HANNAH BEATRICE SELIG, *Assistant Professor of Curriculum and Instruction*, 1967  
B.S., New Jersey Trenton State College;  
M.A., Teachers College Columbia University
- JOHN HERBERT SHANBLUM, *Instructor in Business*, 1969  
B.B.A., The University of Texas at El Paso;  
M.B.A., The University of Texas at Austin
- SPENCER SWEET SHANNON, JR., *Associate Professor of Geology*, 1968  
A.B., Amherst College; M.Sc., Yale University; Ph.D., University of Idaho
- JOHN MCCARTY SHARP, *Professor of Modern Languages*, 1949  
B.A., Westminster College; M.A., Ph.D., University of Chicago
- KENNETH BRUCE SHOVER, *Associate Professor of History*, 1962  
B.A., M.A., University of Missouri at Kansas City;  
Ph.D., University of California at Berkeley
- J. EDGAR SIMMONS, *Assistant Professor of English*, 1966  
B.S., M.A., Columbia University

FACULTY

- MRS. ELIZABETH ANN ROUSE SIPES, *Instructor in Business*, 1968  
 B.B.A., M.Ed., The University of Texas at El Paso
- HAROLD SCHULTZ SLUSHER, *Assistant Professor of Physics*, 1957  
 B.A., University of Tennessee; M.S., University of Oklahoma
- RAY SMALL, *Professor of English*, 1961  
 B.A., West Texas State University; M.A., Ph.D., The University of Texas at Austin
- CHARLES ALVORD SMITH, JR., *Instructor in Modern Languages*, 1966  
 B.A., M.A., University of New Mexico
- MRS. GRACE KNOX SMITH, *Assistant Professor of English*, 1953  
 B.A., M.A., The University of Texas at El Paso
- HERBERT A. SMITH, JR., *Professor of Military Science*, 1969  
 B.S., Rhode Island State College; Colonel, U. S. Army
- JACK SMITH, *Associate Professor of Electrical Engineering*, 1964  
 B.S., M.S., Ph.D., University of Arizona
- CHARLES LELAND SONNICHSEN, *H. Y. Benedict Professor of English*, 1931  
 B.A., University of Minnesota; M.A., Ph.D., Harvard University
- WILLIAM CAJETON SPRINGER, *Assistant Professor of Philosophy*, 1968  
 B.A., Loyola University of Los Angeles;  
 M.A., Gregorianum, Rome, Italy; Ph.D., Rice University
- CHARLES FREDERICK SPRINGSTEAD, *Instructor in English*, 1965  
 B.A., Stanford University
- TONY JASON STAFFORD, *Associate Professor of English*, 1964  
 B.A., Wake Forest University; M.A., The University of Texas at El Paso;  
 Ph.D., Louisiana State University
- CHARLES ROY STANLEY, *Assistant Professor of Music*, 1966  
 B.S., Anderson College; M.S., Southern Baptist Seminary
- CHARLES EDWARD STENICKA III, *Visiting Associate Professor of Business*, 1969  
 J.D., Creighton University
- MRS. ICLE JEAN STEVENS, *Instructor in Curriculum and Instruction*, 1966  
 B.A., University of Nebraska; M.A., University of Denver
- ELLWYN REED STODDARD, *Professor of Sociology*, 1965  
 B.A., Utah State University; M.A., Brigham Young University;  
 Ph.D., Michigan State University
- WILLIAM SAMUEL STRAIN, *Professor of Geology*, 1937  
 B.S., West Texas State University; M.S., University of Oklahoma;  
 Ph.D., The University of Texas at Austin
- MELVIN POTTER STRAUS, *Professor of Political Science*, 1961  
 B.S., M.A., Ph.D., University of Illinois
- FREDERICK BODO STRAUSS, *Associate Professor of Mathematics*, 1968  
 B.A., M.A., Ph.D., The University of California at Los Angeles
- REX WALLACE STRICKLAND, *Professor Emeritus of History*, 1936  
 B.A., Austin College; M.A., Southern Methodist University;  
 Ph.D., The University of Texas at Austin
- MRS. DOROTHY JEAN STROUD, *Instructor in English*, 1965  
 B.A., University of Chicago; M.A., University of Missouri at Kansas City
- BRIAN VESTER SWINGLE, *Assistant Professor of Music*, 1967  
 B.M., Oklahoma Baptist University; M.M., State University of Iowa
- ROBERT LEWIS TAPPAN, *Associate Professor of Modern Languages*, 1954  
 B.A., M.A., The University of Texas at El Paso; Ph.D., Tulane University
- ANTHONY JOSEPH TARQUIN, *Assistant Professor of Civil Engineering*, 1969  
 B.S.I.E., M.S.E., Ph.D., University of West Virginia
- WALTER FULLER TAYLOR, JR., *Associate Professor of English*, 1968  
 B.A., University of Mississippi; Ph.D., Emory University
- HELEN MARGARET TEMPLE, *Assistant Professor of English*, 1967  
 B.S., St. Francis College; M.A., University of Notre Dame;  
 Ph.D., Fordham University

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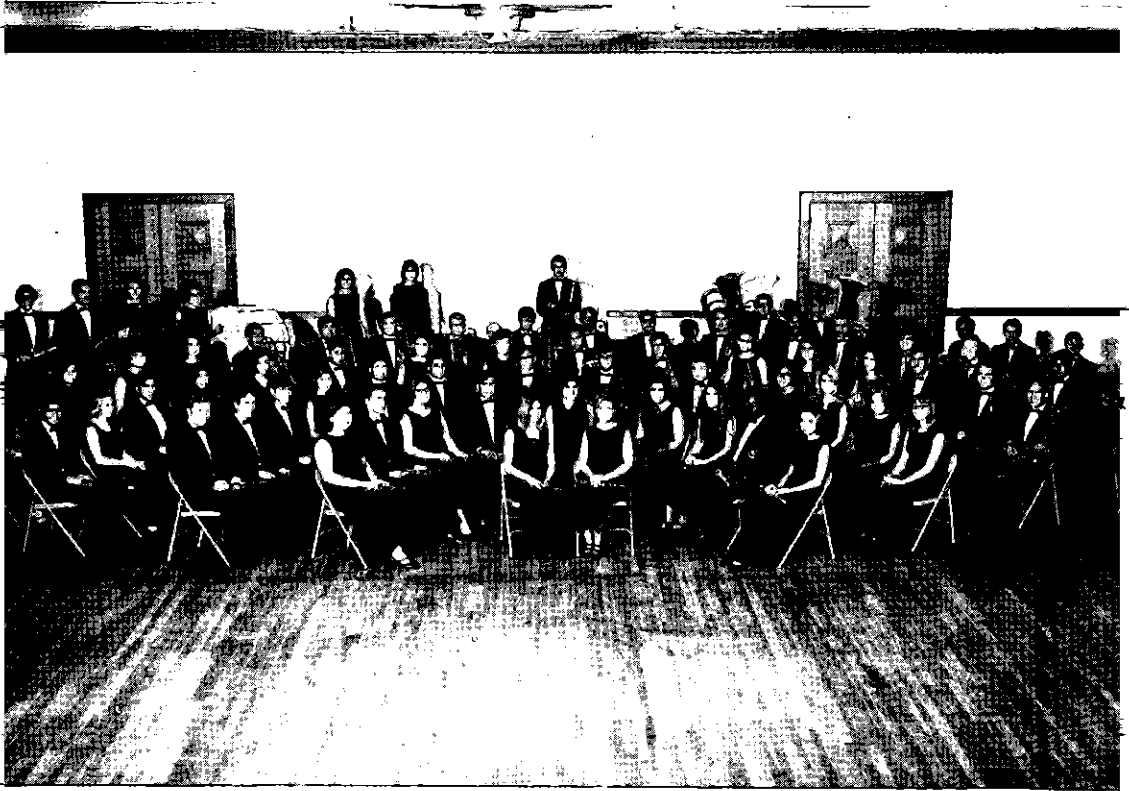
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- LYNN WILLIAM THAYER, *Assistant Professor of Music*, 1959  
B.M., University of Michigan; M. Ed. University of Pittsburgh
- EUGENE McRAE THOMAS, *Professor Emeritus of Metallurgical Engineering*, 1930  
B.S., E.M., The University of Texas at El Paso; M.S., Massachusetts Institute of Technology; Registered Professional Engineer
- ENGBERT A. THORMODSGAARD, *Professor of Music*, 1949  
B.A., Concordia College; M.A., Ed.D., Teachers College, Columbia University
- DIANNE MARIE TIMBERS, *Assistant Professor of Sociology*, 1969  
B.A., M.A., University of Arizona
- WILBERT HELDE TIMMONS, *Professor of History*, 1949  
B.A., Park College; M.A., University of Chicago;  
Ph.D., The University of Texas at Austin
- GEORGE CAMBRIDGE TOMPKINS, *Assistant Professor of Business*, 1958  
B.S., M.S., University of Illinois
- JAMES HENRY TUCKER, *Assistant Professor of Drama and Speech*, 1957  
B.S., University of Alabama; M.F.A., The University of Texas at Austin
- MRS. ELEANORE HERNDON TULLEY, *Assistant Professor of Biology*, 1958  
B.S., New Mexico State University; M.S., University of Northern Iowa
- RUTH ELAINE VISE, *Instructor in English*, 1968  
B.A., M.A., Western New Mexico University
- MRS. MARIE WADDELL, *Assistant Professor of English*, 1954  
B.A., Howard Payne College; M.A., Scarritt College
- HILMAR ERNEST WAGNER, *Assistant Professor of Curriculum and Instruction*, 1966  
B.S., Texas Tech University; M.S., Sul Ross State University;  
Ed.D., North Texas State University
- NEAL RICHARD WAGNER, *Assistant Professor of Mathematics*, 1969  
A.B., University of Kansas; M.A., University of Illinois
- MRS. BOBBIE CARLENE WALKER, *Instructor in English*, 1969  
A.B., Northwestern State College; M.A., University of New Mexico
- CARL WALKER, *Associate Professor of Educational Psychology and Guidance*, 1965  
B.A., M.A., University of Missouri at Columbia; Ed.D., University of New Mexico
- JIMMY REEVES WALKER, *Associate Professor of Health and Physical Education*, 1958  
B.A., M.A., The University of Texas at El Paso; Ed.D., Oklahoma State University
- 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
- JUDITH MARIAN WALLIS, *Instructor in Drama and Speech*, 1969  
B.F.A., Bethany College; M.S., Kansas State College of Pittsburgh
- DOROTHY MARIE WARD, *Instructor in Curriculum and Instruction*, 1969  
B.S., The University of Texas at Austin; M.L.S., Texas Woman's University
- ROBERT GRAVEM WEBB, *Professor of Biology*, 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., *Associate Professor of Mechanical Engineering*, 1959  
B.S., M.S., Texas A. & M. University. Registered Professional Engineer
- JON MANCHIP WHITE, *Associate Professor of English*, 1967  
B.A., Saint Catherine's College (England);  
M.A., University of Cambridge (England)

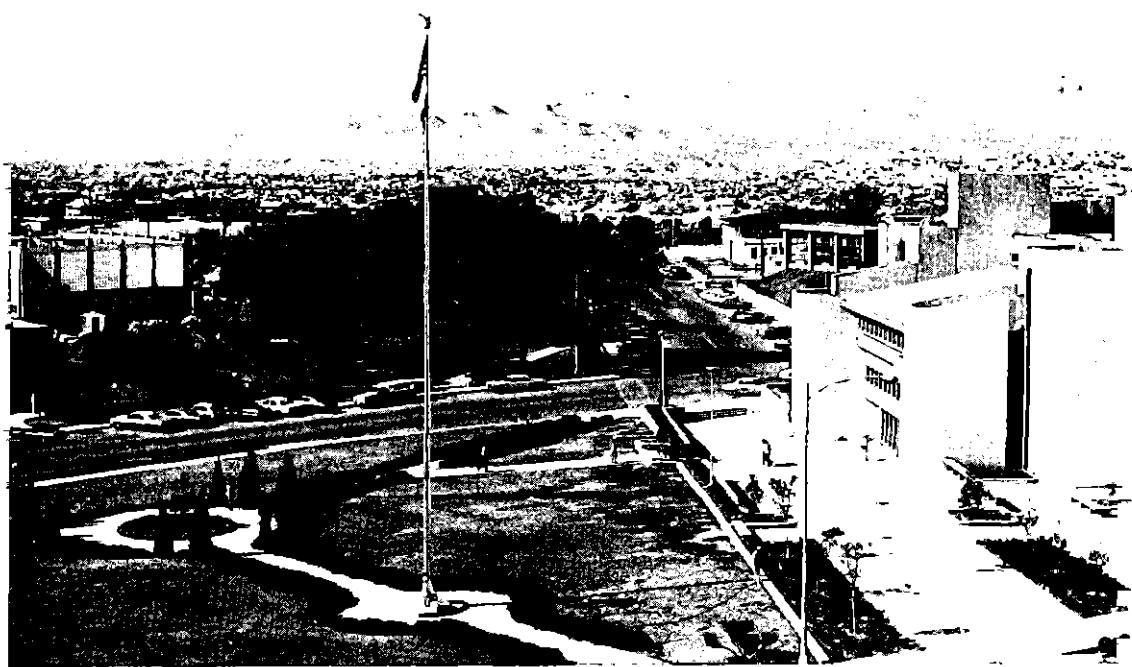


FACULTY

- RANDOLPH HOWARD WHITWORTH, *Associate Professor of Psychology*, 1960  
B.S., Ph.D., The University of Texas at Austin
- DOWELL HEZE WILLIAMS, *Assistant Professor of Curriculum and Instruction*, 1969  
B.B.A., The University of Texas at Austin;  
M.A., Ed.S., New Mexico State University
- JOHN SIMEON WILLIAMS, *Associate Professor of Biology*, 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, *Assistant Professor of Drama and Speech*, 1966  
B.A., Willamette University; Ph.D., Cornell University
- CALVIN E. WOODS, *Professor of Civil Engineering*, 1964  
B.S.C.E., University of Houston; M.S.C.E., University of Colorado;  
Ph.D., The University of Texas at Austin; Registered Professional Engineer
- RICHARD DANE WORTHINGTON, *Assistant Professor of Biology*, 1969  
B.A., The University of Texas at Austin; M.S., Ph.D., University of Maryland
- 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







## 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 and rocky foothills of a southern spur of the Rockies 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.

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. Faculty and students, working mostly through the Schellenger Research Laboratories, handle important research contracts involving many millions of dollars.

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 Art 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 285,000 volumes are housed in stacks. It regularly receives over 2,100 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. The original laboratory has expanded into eight



research and development centers on the campus: The Electronic Research Center, Data Analysis Center, Environmental Test Center, Acoustic Research Center, Optical and Mechanical Test Center, Special Projects Center, Data Recording Center, and Thin Films Center.

More than 125 faculty and staff members and students work part or full time in the Laboratories. Employment with SRL provides students with both financial support and valuable technical training, in many cases continuing on through the Master's degree program.

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 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 COUNSELING SERVICE**, directed by Mr. J. D. Bowles, offers a complete program in aptitude testing and vocational counseling. It is available to students who wish to understand their personal problems and plan for their life work. Special tests such as the Graduate Record Examination are administered by the Counseling Service.

**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**, with Dr. S. D. Myres as editor and Carl Hertzog as designer and typographer, 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.

FOREIGN STUDENTS should contact the Registrar for information about their special problems. The Foreign Student Advisor will be available for counseling on all phases of University life after the student's arrival on the campus.

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.

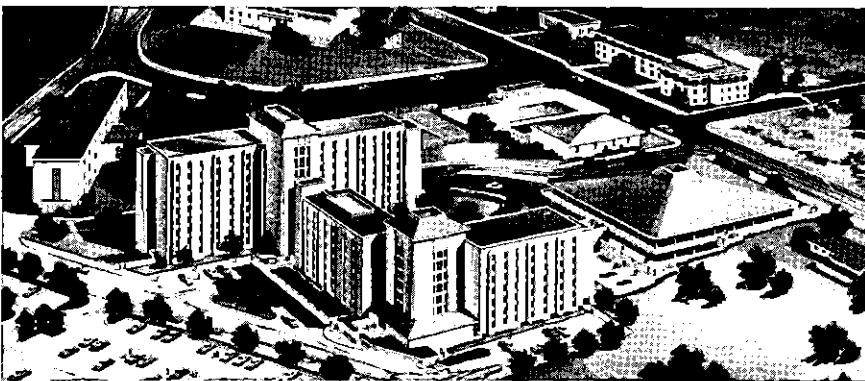
Housing for out-of-town students is provided by six modern and conveniently located dormitories with a capacity of 450 students. Hawthorne House, a private residence hall for men and women, is adjacent to the campus and under University supervision. Meals are served in the dining hall between the two 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.

**C. D. BELDING PERMANENT MEMORIAL FUND** – Founded by Mrs. C. D. Belding in memory of her late husband, this fund's income provides scholarships for students majoring in Physical Education.

**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.

**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 Science to The University of Texas at El Paso each year.

**ROBERT L. GOFF LECTURE FUND** – Established by a bequest of the late Robert L. Goff, a prominent El Paso businessman, the lecture fund is used to bring distinguished lecturers and consultants to the institution.

**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.

**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.

**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.

**ELIZABETH CRAM POLK MEMORIAL ENDOWMENT** – Established in memory of the wife of 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, are establishing a professorship in his honor. The professorship will require 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.

**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.

**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.

**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.

**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.

**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. Mr. Willis was chosen the University's Outstanding Ex-Student the year before his death. 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.



## 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 with sixteen acceptable units from an accredited high school and with minimum test scores as outlined in the section on admission requirements. If you are a mature adult it may be possible to qualify for admission under the Individual Approval program, even though you do not have a high school diploma. You may also enter as a transfer 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 Registrar, The University of Texas at El Paso, for an application form and ask your high-school principal to mail the Registrar a complete transcript of your high-school work. If you are a transfer student, be sure a complete transcript is sent from the college you attended last.

Beginning students must submit scores for the College Entrance Examination Board Scholastic Aptitude Test. You can learn from your high-school principal when the examinations will be given. A physical examination is required of all full-time students. The Registrar will provide blanks for you to take to your doctor.

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 students whose homes are not in El Paso are required to 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.

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.

Admission to the University is controlled by the Faculty and administered by the Registrar and Director of Admissions. Information about registration procedures will be posted in the Administration Building several days before registration, and published in the local newspapers.

**Registration Dates:** Students are admitted three times during the year: August, December, and May. (See "Calendar" at front of this catalog for dates.) Applications and transcripts should be submitted early 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 Admissions Office.

**Hazing Pledge:** By Act of the Texas Legislature, each applicant is required to sign a pledge that he will not "encourage nor participate in hazing or rushes."

**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 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.

**Warning:** Due to class load limits, closed classes, and other factors, late registrants may expect some delay and difficulty in getting satisfactory programs. After classes have begun, the student will be asked to enroll for a reduced program, depending on the lateness of his registration.

**PROCEDURE FOR FOREIGN STUDENTS**

In addition to the requirements for admission on the following page, all foreign student applicants are required to take the TOEFL (Test of English as a Foreign Language) examination which is given throughout the world. For foreign students whose native language is not English, this test in English proficiency is in lieu of the Scholastic Aptitude Test and should be taken in time to allow the results to be sent to the Director of Admissions by June 15 prior to the following September registration. For information concerning the time and place where the examination will be given, the applicant should write to:

TEST OF ENGLISH AS A FOREIGN LANGUAGE  
 Educational Testing Service  
 Princeton, New Jersey, U. S. A. 08540

The University of Texas at El Paso requires all entering foreign students to have adequate hospitalization coverage upon enrolling or to subscribe to the available insurance program during registration.



*There are three ways to qualify:*

1. High School Graduation. 2. Individual Approval. 3. Transfer from Other Colleges.

**1. HIGH SCHOOL GRADUATION**

A graduate from an accredited high school with sixteen acceptable units as outlined in the following patterns, who has shown an aptitude for college studies through the College Entrance Examination Board Scholastic Aptitude Test, will be granted clear admission. The minimum score on the Scholastic Aptitude Test is a combined score of 700 if the student is in the upper half of his graduating class, and a combined score of 800 if the student is in the lower half of his graduating class.

A student who fails to qualify for admission due to test scores may be enrolled as a provisional student. Provisional status entitles the student to ONE summer session or ONE spring semester of trial, at the end of which provisional status must be removed. To be removed from provisional status, the student must either:

- (a) earn not less than nine semester credit hours in a summer session with an average grade of "C" in all courses taken; courses selected to satisfy this requirement must have the approval of the student's academic dean.

No provisional student shall be initially admitted in the second summer term.

or

- (b) earn not less than twelve semester credit hours in a spring semester with an average grade of "C" in all courses taken; courses selected to satisfy this requirement must have the approval of the student's academic dean.

Provisional attendance is restricted to residents of Texas.

**Schools of Business, Education  
Liberal Arts, and Sciences**

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, and Sciences 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**

An applicant, twenty-one years of age or older, who does not have a high school diploma, may, at the discretion of the Registrar 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 Registrar 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 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 an official transcript of his entire college record. This requirement applies to admission to the Summer Session as well as the Long Session.

Trouble and time will be saved by having the Registrar of the College last attended send a transcript directly to the Registrar of The University of Texas at El Paso as soon as possible. Admission cannot be cleared until this transcript is 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. Work done in an unaccredited institution usually may be transferred in accordance with the policy of the state university of the state in which the unaccredited institution is located.

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.

# 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 46-53. 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)

### ***Graduate School***

MASTER OF ARTS

MASTER OF SCIENCE

MASTER OF EDUCATION

## Suggested Outline for the Bachelor of Arts Degree

Basic Subjects generally required of all students in **bold face type**.

*Exceptions and variations are specified in the REQUIREMENTS for MAJORS on pages 55-65, and by the Departments at beginning of Course Descriptions.*

### FRESHMAN YEAR

(16 hours are recommended for each semester)

	Semester Hours
<b>English</b> 3101-02 .....	6
<b>American History</b> 3101-02 or <b>Political Science</b> 3110-11 .....	6
<b>Foreign Language</b> (completion of 4102) .....	4 - 8
<b>Mathematics</b> .....	4 - 6
<b>Laboratory Science</b> (School of Sciences) .....	6 - 8
Elective Courses .....	0 - 9

*NOTE — If your Major is not included above, you may postpone one of the above subjects until your second year, in order to get a start in your Major.*

### SOPHOMORE YEAR

<b>English</b> 3211-12 (or 3213-14 or 3215 and 3216) .....	6
<b>American History</b> 3101-02 or <b>Political Science</b> 3110-11 .....	6
<b>Foreign Language</b> (completion of 3201-02) .....	6
<b>Economics</b> 3203 .....	3
<b>Laboratory Science</b> (School of Sciences) .....	4 - 6
Elective Courses .....	3 - 9

### THIRD AND FOURTH YEARS

<b>Philosophy</b> 3203 .....	3
"Major" subjects — <b>advanced courses</b> .....	12 - 18
<i>(a total of 24 hours required in the Major subject)</i>	
"Minor" subjects — <b>advanced courses</b> .....	6
<i>(a total of 18 hours required in the Minor subject)</i>	
Required Courses not already taken in previous years .....	—
Electives may be taken when all requirements have been met ....	—

*All required freshman numbered courses in the student's curriculum in Arts and Sciences must be completed by the time the student reaches senior classification; otherwise, no credit hours will be granted toward fulfilling degree requirements for the courses even though the courses must be completed.*

#### **General Requirements for Bachelor of Arts Degree:**

- 123 semester hours of credit (minimum total)
- 30 hours must be taken in advanced courses
- 24 hours in Major (12 advanced)
- 18 hours in Minor (6 advanced)

## Suggested Outline for the Bachelor of Science Degree\*

Exceptions and variations specified in requirements for Majors and Minors on p. 60.

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

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

*This plan does not apply to Bachelor of Science in Education, see pages 70-72.*

\*See pages 46-53 for Engineering Degree Plans.

FRESHMAN YEAR	Semester Hours
English 3101-02 .....	6
American History 3101-02 or Political Science 3110-11 .....	6
Mathematics 4110 and 4111 .....	8
Laboratory Science .....	8
Elective Courses .....	3 - 6

(16 hours are recommended for each semester)

SOPHOMORE YEAR	
English 3211-12 (or 3213-14 or 3215 and 3216) .....	6
American History 3101-02 or Political Science 3110-11 .....	6
German 4101-02 .....	8
Economics 3203 .....	3
Laboratory Science .....	6
Elective Courses .....	3
Courses in Major or Minor subjects .....	6

THIRD AND FOURTH YEARS	
Philosophy 3203 .....	3
Laboratory Science (other than Major or Minor) .....	6
"Major" subjects — advanced courses .....	15
<i>(a total of 30 hours required in the Major subject)</i>	
"Minor" subjects — advanced courses .....	6
<i>(a total of 18 hours required in the Minor subject)</i>	
Required Courses not already taken in previous years .....	—
Electives may be taken when all requirements have been met ....	—

*All required freshman numbered courses in the student's curriculum in Arts and Sciences must be completed by the time the student reaches senior classification; otherwise, no credit hours will be granted toward fulfilling degree requirements for the courses even though the courses must be completed.*

### General Requirements for Bachelor of Science Degree:

- 135 semester hours of credit (minimum total)
- 36 hours must be taken in advanced courses
- 30 hours in Major (15 advanced)
- 18 hours in Minor (6 advanced)
- not less than 6 semester hours in a third science

## General Requirements for Undergraduate Degrees

**Degree Plan** — Students in the School of Business, the School of Education, the School of Liberal Arts, and the School of Sciences should secure from their appropriate Dean by the beginning of their third year a plan for the completion of requirements 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 Registrar will distribute diplomas to students who graduate January 31 and August 31. However, any student desiring to participate in the formal commencement at the end of the spring semester may do so by entering the appropriate date on the application for a diploma. 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 Registrar.

**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, November 15; for the spring semester, April 15; and for the summer session, July 10. 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.

**Advanced Placement** — College credit and advanced placement are given for college-level work completed in secondary schools on the basis of CEEB Advanced Placement Examinations.

**Advanced Standing Examinations** — Credit earned by means of Advanced Standing Examinations may not be used to replace any part of the last 30 semester credit hours required for graduation.

**Complete Courses** — In a required course extending through two semesters no credit is given toward a degree until both semesters have been completed.

**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 on all college work attempted is required for the bachelor's degree. In calculating this average, all college work, whether transferred or taken at this University, must be included. A minimum grade-point average of 2.0 on all work attempted at The Uni-

versity 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.

**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 Registrar. 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.

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## *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.



## 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 head and the dean of engineering.

## GRADUATE STUDY IN ENGINEERING

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

### 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 Civil Engineering

### ARRANGEMENT OF COURSES

<b>Freshman Year—1st Semester</b>	<i>Sem. Hrs.</i>	<b>Freshman Year—2nd Semester</b>	<i>Sem. Hrs.</i>
C.E. 3103 Scientific and Engineering Analysis . . . . .	3	C.E. 3115 Engineering Mechanics I . . .	3
Ch. 4103 General Chemistry . . . . .	4	Ch. 4104 General Chemistry . . . . .	4
E. 3101 Freshman English . . . . .	3	E. 3102 Freshman English . . . . .	3
M.E. 3103 Graphical Fundamentals in Engineering Design . . . . .	3	Hi. 3101 History of U.S., to 1865 . . .	3
Ma. 4111 Analytical Geo. and Calculus	4	Ma. 3212 Analytical Geometry and Calculus . . . . .	3
	<u>17</u>		<u>16</u>

<b>Sophomore Year—1st Semester</b>		<b>Sophomore Year—2nd Semester</b>	
C.E. 3202 Engineering Problem Analysis . . . . .	3	C.E. 3213 Engineering Measurements . .	3
C.E. 3238 Engineering Mechanics II . .	3	C.E. 3234 Mechanics of Materials I . .	3
Hi. 3102 History of U.S., since 1865 . .	3	E.E. 4277 Basic Electrical Engineering . . . . .	4
Ma. 3217 Analytical Geometry and Calculus . . . . .	3	Ma. 3326 Differential Equations . . .	3
P.S. 3110 American Government . . . . .	3	P.S. 3111 American Government . . .	3
	<u>15</u>		<u>16</u>

#### Summer (Three Weeks)

C.E. 3214 Field Surveying . . . 3 Sem. Hrs.

<b>Junior Year—1st Semester</b>		<b>Junior Year—2nd Semester</b>	
M.E. 4354 Fluid Mechanics . . . . .	4	C.E. 3326 Engineering Economy . . .	3
Ge. 3321 Geology for Engineers . . . . .	3	C.E. 4343 Structural Analysis I . . . .	4
M.E. 4354 Fluid Mechanics . . . . .	4	M.E. 3375 Thermodynamics I . . . . .	3
Met. 4203 Materials Science . . . . .	4	Approved Electives* . . . . .	6
Approved Electives* . . . . .	2		<u>16</u>
	<u>17</u>		

<b>Senior Year—1st Semester</b>		<b>Senior Year—2nd Semester</b>	
C.E. 3435 Structural Design I . . . . .	3	C.E. 3440 Transportation . . . . .	3
C.E. 4441 Water Treat. and Analysis . .	4	C.E. 4442 Waste Treat. and Analysis . .	4
C.E. 4448 Soil Mechanics . . . . .	4	C.E. 4456 Hydraulics . . . . .	4
Approved Electives* . . . . .	6	C.E. 3461 Structural Design II . . . .	3
	<u>17</u>		<u>14</u>

**Total Semester Credit Hours . . . 131**

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

## Bachelor of Science in Electrical Engineering

### ARRANGEMENT OF COURSES

	Sem.		Sem.
Freshman Year—1st Semester	Hrs.	Freshman Year—2nd Semester	Hrs.
Ch. 4103 General Chemistry . . . . .	4	C.E. 3115 Engineering Mechanics I . . . . .	3
E. 3101 Freshman English . . . . .	3	Ch. 4104 General Chemistry . . . . .	4
Hi. 3101 History of U.S., to 1865 . . . . .	3	E. 3102 Freshman English . . . . .	3
M.E. 3103 Graphical Fundamentals in Engineering Design . . . . .	3	Hi. 3102 History of U.S., since 1865 . . . . .	3
Ma. 4111 Analytical Geometry and Calculus . . . . .	4	Ma. 3212 Analytical Geometry and Calculus . . . . .	3
	17		16
<b>Sophomore Year—1st Semester</b>		<b>Sophomore Year—2nd Semester</b>	
C.E. 3202 Engineering Problem Analysis . . . . .	3	E.E. 4251 Networks I . . . . .	4
C.E. 3238 Engineering Mechanics II . . . . .	3	Ma. 3326 Differential Equations . . . . .	3
Ma. 3217 Analytical Geometry and Calculus . . . . .	3	P.S. 3111 American Government . . . . .	3
P.S. 3110 American Government . . . . .	3	Approved Elective* . . . . .	3
Ph. 4217 Optics, Sound, Heat . . . . .	4	Ph. 3326 Fund. Mod. Atomic Ph. . . . .	3
	16		16
<b>Junior Year—1st Semester</b>		<b>Junior Year—2nd Semester</b>	
E.E. 2310 Elect. Eng. Lab. I . . . . .	2	E.E. 4321 Electromagnetic Field Theory . . . . .	4
E.E. 3339 Electronics I . . . . .	3	E.E. 4340 Electronics II . . . . .	4
E.E. 3352 Networks II . . . . .	3	M.E. 3275 Thermodynamics I . . . . .	3
Approved Electives* . . . . .	3	Approved Elective* . . . . .	6
Met. 3309 Phys of Materials . . . . .	3		17
	17		
<b>Senior Year</b>		<b>Two Semesters</b>	
E.E. 3441 Communication Systems . . . . .	3	E.E. 4447 Electromagnetic Energy Transmission & Radiation . . . . .	4
E.E. 4447 Electromagnetic Energy Transmission & Radiation . . . . .	4	E.E. 3464 Systems & Controls . . . . .	3
E.E. 3464 Systems & Controls . . . . .	3	E.E. 4485 Energy Conversion . . . . .	4
E.E. 4485 Energy Conversion . . . . .	4	C.E. 3326 Engineering Economy . . . . .	3
C.E. 3326 Engineering Economy . . . . .	3	Approved Electives* . . . . .	12
Approved Electives* . . . . .	12		29
	29		
<b>Total Semester Credit Hours . . . . .</b>		<b>128</b>	

\*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**

	Sem. Hrs.		Sem. Hrs.
<b>Freshman Year—1st Semester</b>		<b>Freshman Year—2nd Semester</b>	
Ch. 4103 General Chemistry . . . . .	4	Ch. 4104 General Chemistry . . . . .	4
E. 3101 Freshman English . . . . .	3	E. 3102 Freshman English . . . . .	3
Hi. 3101 History of U.S., to 1865 . . . . .	3	Hi. 3102 History of U.S., since 1865 . . . . .	3
M.E. 3103 Graphical Fundamentals of Engineering Design . . . . .	3	M.E. 3104 Freshman Design . . . . .	3
Ma. 4111 Analytical Geometry and Calculus . . . . .	4	Ma. 3212 Analytical Geometry and Calculus . . . . .	3
	17		16
<b>Sophomore Year—1st Semester</b>		<b>Sophomore Year—2nd Semester</b>	
C.E. 3115 Engineering Mechanics I . . . . .	3	C.E. 3238 Engineering Mechanics II . . . . .	3
E.E. 4277 Basic Electrical Engineering . . . . .	4	E.E. 4278 Electronics for Scientists and Engineers . . . . .	4
Ma. 3217 Analytical Geometry and Calculus . . . . .	3	M.E. 3205 Basic Measurement and Instrumentation . . . . .	3
Met. 4203 Materials Science . . . . .	4	M.E. 3275 Thermodynamics I . . . . .	3
	14	Ma. 3326 Differential Equations . . . . .	3
			16
<b>Junior Year—1st Semester</b>		<b>Junior Year—2nd Semester</b>	
C.E. 3234 Mechanics of Materials I . . . . .	3	C.E. 3326 Engineering Economy . . . . .	3
M.E. 3236 Manufacturing Processes . . . . .	3	M.E. 3201 Engineering Communications . . . . .	3
M.E. 4354 Fluid Mechanics . . . . .	4	M.E. 4351 Heat Transfer . . . . .	4
M.E. 4363 Kinematics and Dynamics of Mechanisms . . . . .	4	M.E. 4365 Dynamic Response . . . . .	4
M.E. 3376 Thermodynamics II . . . . .	3	P.S. 3110 American Government . . . . .	3
	17		17
<b>Senior Year—1st Semester</b>		<b>Senior Year—2nd Semester</b>	
M.E. 3455 Gas Dynamics . . . . .	3	M.E. 4466 Machine Design . . . . .	4
M.E. 3464 Design of Machine Members . . . . .	3	Approved Electives* . . . . .	12
P.S. 3111 American Government . . . . .	3		16
Approved Electives* . . . . .	6		
	15		

**Total Semester Credit Hours . . . . . 128**

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

**Bachelor of Science in Mechanical Engineering**

(INDUSTRIAL ENGINEERING OPTION)

**ARRANGEMENT OF COURSES**

	Sem. Hrs.		Sem. Hrs.
<b>Freshman Year—1st Semester</b>		<b>Freshman Year—2nd Semester</b>	
Ch. 4103 General Chemistry . . . . .	4	Ch. 4104 General Chemistry . . . . .	4
E. 3101 Freshman English . . . . .	3	E. 3102 Freshman English . . . . .	3
Hi. 3101 History of the U.S., to 1865 . . . . .	3	Hi. 3102 History of the U.S., to 1865 . . . . .	3
M.E. 3103 Graphic Fundamentals of Engineering Design . . . . .	3	M.E. 3104 Freshman Design . . . . .	3
Ma. 4111 Analytical Geometry and Calculus . . . . .	4	Ma. 3212 Analytical Geometry and Calculus . . . . .	3
	<u>17</u>		<u>16</u>
<b>Sophomore Year—1st Semester</b>		<b>Sophomore Year—2nd Semester</b>	
Acct. 3309 Survey of Accounting Principles . . . . .	3	C.E. 3238 Engineering Mechanics II . . . . .	3
C.E. 3115 Engineering Mechanics I . . . . .	3	E.E. 4278 Electronics for Scientists and Engineers . . . . .	4
E.E. 4277 Basic Electrical Engineering . . . . .	4	M.E. 3205 Basic Measurement and Instrumentation . . . . .	3
Ma. 3217 Analytical Geometry and Calculus . . . . .	3	M.E. 3275 Thermodynamics . . . . .	3
Met. 4203 Materials Science . . . . .	4	Ma. 3326 Differential Equations . . . . .	3
	<u>17</u>		<u>16</u>
<b>Junior Year—1st Semester</b>		<b>Junior Year—2nd Semester</b>	
C.E. 3234 Mechanics of Materials I . . . . .	3	C.E. 3326 Engineering Economy . . . . .	3
M.E. 3236 Manufacturing Processes . . . . .	3	M.E. 3201 Engineering Communications . . . . .	3
M.E. 4354 Fluid Mechanics . . . . .	4	M.E. 3486 Human Factors in Engineering . . . . .	3
M.E. 4363 Kinematics and Dynamics of Mechanisms . . . . .	4	M.E. 4377 Work Measurement . . . . .	4
Approved Elective* . . . . .	3	P.S. 3110 American Government . . . . .	3
	<u>17</u>		<u>16</u>
<b>Senior Year—1st Semester</b>		<b>Senior Year—2nd Semester</b>	
M.E. 3464 Design of Machine Members . . . . .	3	M.E. 3484 Industrial Layout . . . . .	3
M.E. 3483 Tool Design . . . . .	3	M.E. 3485 Quality Control . . . . .	3
Ma. 3331 Statistics . . . . .	3	P.S. 3111 American Government . . . . .	3
Approved Electives* . . . . .	6	Approved Electives* . . . . .	6
	<u>15</u>		<u>15</u>
<b>Total Semester Credit Hours . . . . . 129</b>			

\*Nine hours of electives must be selected from the Humanities and Social Sciences; six hours of electives must be selected from the following list:

- |                                  |                                       |
|----------------------------------|---------------------------------------|
| C.E. 3446                        | Marketing 3201                        |
| Business Law 3301                | Personnel Management 3301, 3302, 3303 |
| Ma. 3323, 3324, 3335, 3429, 3436 | Production Management 3301, 3303      |

**Bachelor of Science in Metallurgical Engineering**

(CHEMICAL METALLURGY OPTION)

**ARRANGEMENT OF COURSES**

<b>Freshman Year—1st Semester</b>	<i>Sem. Hrs.</i>	<b>Freshman Year—2nd Semester</b>	<i>Sem. Hrs.</i>
Ch. 4103 General Chemistry . . . . .	4	C.E. 3115 Engineering Mechanics I . . . . .	3
E. 3101 Freshman English . . . . .	3	Ch. 4104 General Chemistry . . . . .	4
Hi. 3101 History of U.S. to 1865 . . . . .	3	E. 3102 Freshman English . . . . .	3
M.E. 3103 Graphical Fundamentals in Engineering Design . . . . .	3	Hi. 3102 History of U.S., since 1865 . . . . .	3
Ma. 4111 Analytical Geometry and Calculus . . . . .	4	Ma. 3212 Analytical Geometry and Calculus . . . . .	3
	<u>17</u>		<u>16</u>
<b>Sophomore Year—1st Semester</b>		<b>Sophomore Year—2nd Semester</b>	
C.E. 3238 Engineering Mechanics II . . . . .	3	C.E. 3202 Engineering Problem Analysis . . . . .	3
Ch. 5213 Analytical Chemistry . . . . .	5	E.E. 4278 Electronics for Scientists and Engineers . . . . .	4
Ma. 3217 Analytical Geometry and Calculus . . . . .	3	M.E. 3201 Engineering Communications . . . . .	3
P.S. 3110 American Government . . . . .	3	Ma. 3326 Differential Equations . . . . .	3
	<u>14</u>	Met. 4203 Materials Science . . . . .	4
			<u>17</u>
<b>Junior Year—1st Semester</b>		<b>Junior Year—2nd Semester</b>	
C.E. 3326 Engineering Economy . . . . .	3	Ch. 4361 Physical Chemistry . . . . .	4
Ch. 4360 Physical Chemistry . . . . .	4	Ch. 4225 Organic Chemistry . . . . .	4
Ch. 4224 Organic Chemistry . . . . .	4	Met. 3315 Non-Ferrous Process Metallurgy . . . . .	3
Approved Electives* . . . . .	6	P.S. 3111 American Government . . . . .	3
	<u>17</u>	Approved Elective* . . . . .	3
			<u>17</u>
<b>Senior Year—1st Semester</b>		<b>Senior Year—2nd Semester</b>	
Met. 4409 Chemical Kinetics . . . . .	4	Ma. 3335 Higher Mathematics for Engineers and Physicists . . . . .	3
Met. 4408 Transport Phenomena . . . . .	4	Met. 3410 Chemical Reactor Design . . . . .	3
Met. 3404 Electro-Metallurgy . . . . .	3	Approved Electives* . . . . .	10
Met. 3406 Chemical Engineering Thermodynamics . . . . .	3		<u>16</u>
Approved Electives* . . . . .	3		
	<u>17</u>		

**Total Semester Credit Hours . . . . . 131**

\*Nine hours of electives must be selected from the Humanities and Social Sciences; nine hours from Metallurgical Engineering; balance from Engineering, Mathematics, and the Biological or Physical Sciences.

## Bachelor of Science in Metallurgical Engineering

(PHYSICAL METALLURGY OPTION)

### ARRANGEMENT OF COURSES

	<i>Sem.</i>		<i>Sem.</i>
<b>Freshman Year—1st Semester</b>	<i>Hrs.</i>	<b>Freshman Year—2nd Semester</b>	<i>Hrs.</i>
Ch. 4103 General Chemistry . . . . .	4	C.E. 3115 Engineering Mechanics I . . . . .	3
E. 3101 Freshman English . . . . .	3	Ch. 4104 General Chemistry . . . . .	4
Hi. 3101 History of U.S., to 1865 . . . . .	3	E. 3102 Freshman English . . . . .	3
M.E. 3103 Graphical Fundamentals in Engineering Design . . . . .	3	Hi. 3102 History of U.S., since 1865 . . . . .	3
Ma. 4111 Analytical Geometry and Calculus . . . . .	4	Ma. 3212 Analytical Geometry and Calculus . . . . .	3
	17		16
<b>Sophomore Year—1st Semester</b>		<b>Sophomore Year—2nd Semester</b>	
C.E. 3238 Engineering Mechanics II . . . . .	3	C.E. 3202 Engineering Problem Analysis . . . . .	3
Ch. 2224 Organic Chemistry . . . . .	2	Ma. 3326 Differential Equations . . . . .	3
Ma. 3217 Analytical Geometry and Calculus . . . . .	3	Met. 4203 Materials Science . . . . .	4
Met. 3201 Principles of Process Metallurgy . . . . .	3	P.S. 3111 American Government . . . . .	3
P.S. 3110 American Government . . . . .	3	Ph. 4216 Electricity and Magnetism . . . . .	4
Approved Elective* . . . . .	3		17
	17		
<b>Junior Year—1st Semester</b>		<b>Junior Year—2nd Semester</b>	
C.E. 3326 Engineering Economy . . . . .	3	Ch. 4361 Physical Chemistry . . . . .	4
Ch. 4360 Physical Chemistry . . . . .	4	E.E. 4278 Electronics for Scientists . . . . .	4
Met. 3309 Physics of Materials . . . . .	3	M.E. 3201 Engineering Communications . . . . .	3
Ph. 4217 Optics, Sound and Heat . . . . .	4	Ph. 3326 Fundamentals of Modern Atomic Physics . . . . .	3
Approved Elective* . . . . .	3	Approved Elective* . . . . .	3
	17		17
<b>Senior Year—1st Semester</b>		<b>Senior Year—2nd Semester</b>	
Met. 3413 Thermodynamics of Metals . . . . .	3	Met. 4412 Physical Metallurgy III . . . . .	4
Met. 4407 Physical Metallurgy I . . . . .	4	Met. 4415 Mechanical Metallurgy . . . . .	4
Met. 4411 Physical Metallurgy II . . . . .	4	Approved Electives* . . . . .	8
Approved Elective* . . . . .	3		16
	14		

**Total Semester Credit Hours . . . . . 131**

\*Nine hours of electives must be selected from the Humanities and Social Sciences; nine hours from Metallurgical Engineering; balance from Engineering, Mathematics, and the Biological or Physical Sciences.

**Bachelor of Science in Metallurgical Engineering**

(PROCESS METALLURGY OPTION)

**ARRANGEMENT OF COURSES**

	Sem. Hrs.		Sem. Hrs.
<b>Freshman Year—1st Semester</b>		<b>Freshman Year—2nd Semester</b>	
Ch. 4103 General Chemistry . . . . .	4	C.E. 3115 Engineering Mechanics I . . .	3
E. 3101 Freshman English . . . . .	3	Ch. 4104 General Chemistry . . . . .	4
Hi. 3101 History of U.S., to 1865 . . .	3	E. 3102 Freshman English . . . . .	3
M.E. 3103 Graphic Fundamentals in Engineering Design . . . . .	3	Hi. 3102 History of U.S., since 1865 . .	3
Ma. 4111 Analytical Geometry and Calculus . . . . .	4	Ma. 3212 Analytical Geometry and Calculus . . . . .	3
	<u>17</u>		<u>16</u>
<b>Sophomore Year—1st Semester</b>		<b>Sophomore Year—2nd Semester</b>	
C.E. 3238 Engineering Mechanics II . .	3	Ge. 2215 Mineralogy . . . . .	2
Ch. 2224 Organic Chemistry . . . . .	2	Ma. 3326 Differential Equations . . .	3
Ma. 3217 Analytical Geometry and Calculus . . . . .	3	Met. 4203 Materials Science . . . . .	4
Met. 3201 Principles of Process Metallurgy . . . . .	3	P.S. 3111 American Government . . .	3
P.S. 3110 American Government . . .	3	Ph. 4216 Electricity and Magnetism . .	4
Approved Elective* . . . . .	3		<u>16</u>
	<u>17</u>		
<b>Junior Year—1st Semester</b>		<b>Junior Year—2nd Semester</b>	
C.E. 3326 Engineering Economy . . .	3	Ch. 4361 Physical Chemistry . . . . .	4
Ch. 4360 Physical Chemistry . . . . .	4	E.E. 4278 Electronics for Scientists and Engineers . . . . .	4
Met. 4302 Mineral Dressing I . . . . .	4	M.E. 3201 Engineering Communications . . . . .	3
Ph. 4217 Optics, Sound and Heat . . .	4	Met. 3315 Non-Ferrous Process Metallurgy . . . . .	3
Approved Elective* . . . . .	3	Ph. 3326 Fundamentals of Modern Atomic Physics . . . . .	3
	<u>18</u>		<u>17</u>
<b>Senior Year—1st Semester</b>		<b>Senior Year—2nd Semester</b>	
Met. 3404 Electro-Metallurgy . . . . .	3	Met. 3402 Ferrous Process Metallurgy . . . . .	3
Met. 3413 Thermodynamics of Metals .	3	Approved Electives* . . . . .	11
Met. 4411 Physical Metallurgy II . . .	4		<u>14</u>
Approved Electives* . . . . .	6		
	<u>16</u>		
<b>Total Semester Credit Hours . . . 131</b>			

\*Nine hours of electives must be selected from the Humanities and Social Sciences; nine hours from Metallurgical Engineering; balance from Engineering, Mathematics, and the Biological or Physical Sciences.

## SCHOOL OF BUSINESS

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## SCHOOL OF EDUCATION

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## SCHOOL OF LIBERAL ARTS

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## SCHOOL OF SCIENCES

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### *Bachelor of Arts*

#### MAJOR SUBJECTS

Art	Geology	Physical Education
Biological Sciences	German	Physics
Business Administration	History	Political Science
Chemistry	Inter-American Studies	Psychology
Drama	Journalism	Radio-Television
Economics	Linguistics	Sociology
English	Mathematics	Spanish
Finance	Philosophy	Speech
French		Speech Pathology

#### MINOR SUBJECTS

Anthropology	English	Mexican American Studies
Art	Finance	Music
Biological Sciences	French	Philosophy
Black Studies	Geology	Physics
Business Administration	German	Psychology
Chemistry	Government	Radio-Television
Drama	History	Sociology
Economics	Journalism	Spanish
Education	Library Services	Speech
	Mathematics	

**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.



## *Bachelor of Arts*

Variations from the general requirements, including additional semester hours as well as specific courses to be included for a particular major subject, are listed under each Department's Course Descriptions (following page 83 of this catalog).

Bachelor of Arts *All Levels Teaching Programs* in Art, Music, Physical Education, and Drama and Speech are outlined on pages 67, 68, and 69.

### *Min. Sem. Hrs.*

- 24 - MAJOR SUBJECT: including 12 advanced hours. (A minimum of 45 required in Art including 12 advanced.)
- 18 - MINOR SUBJECT: including 6 advanced hours.
- 12 - ENGLISH 3101-02, 3211-12 or 3213-14 or 3215-16.
- 14 - FOREIGN LANGUAGE: completion of 4101-02,\* 3201-02.
- 12 - SCIENCES (To be taken in School of Science).
- 6 - MATHEMATICS: (Mathematics 4110 and 4111 for majors in Mathematics, Chemistry, Physics and for a minor in Physics. Mathematics 4110 or 6 semester hours of other Mathematics courses for most other majors.)
- 3 - ECONOMICS 3203.
- 6 - HISTORY 3101-02.
- 6 - POLITICAL SCIENCE 3110-11
- 3 - PHILOSOPHY 3203.
- § - ELECTIVES: to make a minimum of 123 semester hours, including 30 semester hours in advanced courses. Not more than 66 semester hours may be in the major and minor subjects.

One-hour courses may not be counted toward requirements of the major or of the minor.

For residence requirements, see page 44.

\* Requirements may be reduced by placement examinations given in the Department of Modern Languages.

### TEACHER CERTIFICATION

Students who plan to teach in the public schools and who wish to earn a Bachelor of Arts degree should confer with the Dean of the School of Liberal Arts.

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### 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, Mr. L. Phil Blanchard, Mr. John C. Akard, or Mr. Joseph B. Graves.

### PRE - MEDICAL

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 Pre-Medical 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 a written and 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 3308, Government 3332, History 3205-06, Philosophy 3212, Psychology 3101 and 3202, Sociology 3101-02.

**ECONOMICS - BUSINESS OPTION**

ACCOUNTING	3101, 3102.
BUSINESS	3305.
ECONOMICS	3365, 3366, 3367
SOCIAL SCIENCES	Three of the following: History 3346, 3347, 3348, 3349; Government 3333; Sociology 3336, 3360.
SPANISH	3357; and one of the following: 3322, 3324, 3360, 3362, 3363, 3364, 3365, 3467.
ADVANCED ELECTIVES	3 hours.

**GOVERNMENT OPTION**

GOVERNMENT	3439; and four of the following: 3333, 3343, 3344, 3347, 3424, 3433.
SPANISH	3357; and one of the following: 3322, 3324, 3360, 3362, 3363, 3364, 3365, 3467.
SOCIAL SCIENCES	Three of the following: History 3346, 3347, 3348, 3349; Economics 3366, 3367; Sociology 3336, 3360.
ADVANCED ELECTIVES	6 hours.

**HISTORY OPTION**

HISTORY	Four of the following: 3346, 3347, 3348, 3349, 3311, 3312.
SPANISH	3357; and one of the following: 3322, 3324, 3360, 3362, 3363, 3364, 3365, 3467.
SOCIAL SCIENCES	Three of the following: Economics 3366, 3367; Government 3333; Sociology 3336, 3360.
ADVANCED ELECTIVES	9 hours.

**SPANISH OPTION**

SPANISH	3357; and three of the following: 3322, 3324, 3360, 3362, 3364, 3365, 3467.
HISTORY	Two of the following: 3346, 3347, 3348, 3349.
SOCIAL SCIENCES	Three of the following: Economics 3366, 3367; Government 3333; Sociology 3336, 3360.
ADVANCED ELECTIVES	9 hours.

BACHELOR OF ARTS  
LINGUISTICS MAJOR

RAY PAST, *Program Director*

The major in linguistics is an inter-disciplinary program which differs from majors in linguistics at other campuses primarily in its insistence on Spanish as one of the languages to be studied, a natural outgrowth of this University's location.

In addition to the general requirements for the B.A. degree, the following specific requirements are prescribed:

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.

ENGLISH 3220 Introduction to Linguistics.

SPEECH 3110 Phonetics.

ENGLISH 3309 The Structure of the English Language.

ENGLISH 3471 Studies in English as Language. (This course may be counted toward this requirement only when the topic is grammatical analysis.)

SPANISH 3309 or 3357 The Structure of Spanish or Advanced Composition and Grammar Review.

ENGLISH 3419 The Foundations of the English Language.

*In addition, the student must choose a minimum of six hours from the following:*

ENGLISH 3308 Teaching English as a Second Language. (May not be counted in addition to Spanish 3400.)

SPANISH 3400 Language Theory and Analysis. (May not be counted in addition to English 3308.)

ENGLISH 3471 Studies in English as Language. (Provided the topic differs from when it was previously taken.)

PSYCHOLOGY 3454 Seminar in Psychology. (When topic is psycholinguistics.)

ENGLISH 3472 Contrastive Linguistics, Spanish, English. (May not be counted in addition to Spanish 3472.)

SPANISH 3472 Contrastive Linguistics, Spanish, English. (May not be counted in addition to English 3472.)

SPANISH 3492 Phonology.

SPANISH 3493 Morphology.

ENGLISH 3395 Linguistics in the Classroom.

SPANISH 3309 or 3357 (Whichever not taken in required courses listed above.)

*The following minor is required:*

1. Competence through 3202 in a second European language.
2. 4101-02 in a non-Indo-European language.

### **PROGRAM IN MEXICAN AMERICAN STUDIES**

The Mexican American Studies program offers an interdisciplinary minor for the Bachelor of Arts degree. This program is designed to provide knowledge of the history, culture and heritage of the Mexican American, and of his role in politics in the Anglo-American society.

In addition to meeting the general requirements for the Bachelor of Arts degree, the student minoring in Mexican American Studies must earn 18 hours in courses selected from those listed below, six hours of which must be advanced and nine hours of which must be in one discipline. At least nine of the required 18 hours must be selected from core courses in the program; these hours may not be taken in the department of the student's major.

All courses listed in the program are open to any student having the academic prerequisites. Credit earned may be counted (1) toward a minor in Mexican American Studies; (2) toward a departmental major or minor, where appropriate; or (3) as elective hours.

#### **CORE COURSES**

- ANTHROPOLOGY 3105 Culture of the Mexican American
- DRAMA 3335 Mexican American Theatre and Drama
- EDUCATION 3333 Education and the Mexican American
- ENGLISH 3310 Literature of the Mexican American
- ENGLISH 3374 Folklore of the Mexican American
- HISTORY 3209 The Mexican American
- PHILOSOPHY 3213 Mexican American Thought
- POLITICAL SCIENCE 3320 Ethnic Politics in the U.S.
- PSYCHOLOGY 3203 Social Psychology of the Mexican American
- SOCIOLOGY 3358 Spanish-Speaking Groups in the Southwest
- SOCIOLOGY 3359 The Mexican American and Social Institutions
- SPEECH 3345 The Rhetoric of Mexican American Affairs

#### **RELATED COURSES**

- ART 3310 History of Latin American Art
- HISTORY 3348 Mexico in the Colonial Period
- HISTORY 3349 Mexico, Since 1821
- HISTORY 3317 History of Texas Since 1821
- HISTORY 3210 Desert Frontier
- HISTORY 3342 The Spanish Borderlands
- PHILOSOPHY 3212 Latin American Philosophy
- POLITICAL SCIENCE 3433 Latin American Political Thought
- POLITICAL SCIENCE 3444 Political Systems of Mexico
- SOCIOLOGY 3327 Minority Groups in the United States
- SOCIOLOGY 3336 Comparative Cultures
- SOCIOLOGY 3352 Sociology of Poverty
- SPANISH 3322 *La cultura hispánica en las Americas*
- SPANISH 3324 The Literary History of Mexico
- SPANISH 3325 The Novel of the Mexican Revolution

**PROGRAM IN BLACK STUDIES**

The Black Studies program offers an interdisciplinary minor for the Bachelor of Arts degree. This 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.

In addition to meeting the general requirements for the Bachelor of Arts degree, the student minoring in Black Studies must earn 18 hours in courses selected from those listed below, six hours of which must be advanced and nine hours of which must be in one discipline. These nine hours may not be taken in the department of the student's major.

All courses listed in the program are open to any student having the academic prerequisites. Credit earned may be counted (1) toward a minor in Black Studies; (2) toward a departmental major or minor, where appropriate; or (3) as elective hours.

- 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 3207 The Afro-American, to 1865
- HISTORY 3208 The Afro-American, Since 1865
- 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 Ethnic Politics in the U.S.
- POLITICAL SCIENCE 3435 Contemporary Political Thought
- SOCIOLOGY 3327 Minority Groups in the U.S.
- SOCIOLOGY 3336 Comparative Cultures
- SOCIOLOGY 3352 Sociology of Poverty

## ***Bachelor of Science*** (SCIENCES)

**MAJORS:** Biological Sciences, Chemistry, Geology, Mathematics, Physics.

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

***Min. Sem. Hrs.***

- 30 — MAJOR: at least 30 semester hours including 15 semester hours of advanced courses.
- 18 — MINOR: at least 18 semester hours including 6 semester hours of advanced courses.
- 6 — SCIENCE: another laboratory science as listed above.
- 6 — POLITICAL SCIENCE 3110-11.
- 6 — HISTORY 3101 and 3102.
- 3 — ECONOMICS 3203.
- 3 — PHILOSOPHY 3203.
- 12 — ENGLISH 3101-02, and 3211-12 or 3213-14 or 3215 and 3216.
- 9 — MATHEMATICS 4110, 4111. (Exception: Mathematics 3101 and 3102 may be substituted in the Biological Sciences major - Geology minor.)
- § — ELECTIVES: to make a minimum total of at least 135 semester hours, including a total of 36 semester hours in advanced courses. Foreign language should be included if the student plans graduate work.

Variations from the general requirements, including additional semester hours as well as specific courses to be included for a particular major subject, are listed under each Department's Course Descriptions (following page 84 of this catalog).

§ *Varies according to student's capabilities.*

## *Bachelor of Business Administration*

STUDENTS INTERESTED IN THE BACHELOR OF ARTS DEGREE — SEE PAGE 86

### GENERAL EDUCATION CORE REQUIREMENTS

*(48 Minimum Semester Hours)*

- 6 — ECONOMICS 3203-3204;
- 12 — ENGLISH 3101-3102 and 3211-3212 or 3213-3214 or 3215 and 3216.
- 6 — POLITICAL SCIENCE 3110-3111.
- 6 — HISTORY 3101-3102.
- 6 — MATHEMATICS; including 3120.
- 6 — NATURAL SCIENCE: Biology, Chemistry, Geology, Physics.
- 3 — PHILOSOPHY, PSYCHOLOGY, or SOCIOLOGY.
- 3 — SPEECH.

### BUSINESS CORE REQUIREMENTS\*

*(36 Minimum Semester Hours)*

- 9 — ACCOUNTING 3101, 3102, 3205.
- 6 — FINANCE 3310 and either Finance 3320 or Economics 3320.
- 3 — MARKETING 3201.
- 3 — OFFICE MANAGEMENT 3203.
- 3 — PERSONNEL MANAGEMENT 3201.
- 3 — STATISTICS 3201.
- 3 — GENERAL BUSINESS 3203.
- 3 — BUSINESS LAW 3301.
- 3 — GENERAL BUSINESS 3402.

### BUSINESS MAJOR OPTIONS

*(39 Minimum Semester Hours)*

In addition to the General Education and Business Core requirements, the student, with the aid of his Business Administration counselor, will select one of the following options.

#### **ACCOUNTING OPTION**

- 6 — ACCOUNTING 3201, 3202.
  - 12 — ACCOUNTING CONCENTRATION ELECTIVES.
  - 12 — NON-BUSINESS ELECTIVES.
  - 9 — FREE ELECTIVES.
- (Accounting option may substitute another Accounting course for Accounting 3205 in the CORE Requirements.)

#### **GENERAL BUSINESS OPTION**

- 18 — BUSINESS CONCENTRATION ELECTIVES.
- 12 — NON-BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

#### **ECONOMICS OPTION**

- 12 — BUSINESS CONCENTRATION ELECTIVES.
- 6 — ECONOMICS 3302, 3303.
- 12 — ECONOMICS ELECTIVES
- 9 — FREE ELECTIVES.

#### **FINANCE OPTION**

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

\*A student must complete all lower division core courses before enrolling in required or elective upper division courses.

*Min. Sem. Hrs.*

**PRE-PUBLIC SERVICE OPTION**

- 12 — BUSINESS CONCENTRATION ELECTIVES.
- 18 — POLITICAL SCIENCE ELECTIVES
- 9 — FREE ELECTIVES.

**MARKETING OPTION**

- 6 — MARKETING 3301 and 3401.
- 6 — MARKETING 3302, 3304, 3305 or 3306.
- 6 — ADVANCED BUSINESS ELECTIVES.
- 12 — NON BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

**PERSONNEL MANAGEMENT AND  
INDUSTRIAL RELATIONS OPTION**

- 12 — PERSONNEL MANAGEMENT 3301, 3302, 3303 or 3304, and 3402.
- 6 — ADVANCED BUSINESS ELECTIVES.
- 12 — NON BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

**OFFICE MANAGEMENT OPTION**

- 21 — OFFICE MANAGEMENT 3102, 3104, 3301, 3302, 3303, 3304, 3305 or 3306.
- 9 — NON BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

**PRODUCTION MANAGEMENT OPTION**

- 12 — PRODUCTION MANAGEMENT 3301, 3302, 3303, 3304 or 3305.
- 6 — ADVANCED BUSINESS ELECTIVES.
- 12 — NON BUSINESS ELECTIVES.
- 9 — FREE ELECTIVES.

*NOTE: A minimum of 123 semester hours of credit is required for the degree of Bachelor of Business Administration to be completed with a 2.0 grade point average on all business administration courses required under the student's chosen approved degree concentration program.*

*A "C" average in freshman English is prerequisite to enrollment in all business administration courses but enrollment may be concurrent.*



**SPECIAL CONCENTRATIONS 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 concentrate his study on selected industries or professions. These are all advising programs and a student interested in one of these concentrations must seek special counsel from the listed advisor.

**ADVERTISING CONCENTRATION** under the General Business or 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.

**METALLURGY CONCENTRATION** under the General Business Option – This program enables the student to earn the B.B.A. degree and to study the basic managerial problems associated with the physical and business environment of the primary metal industries.

*Business Advisor:* Mr. D. K. Freeland.

*Other:* Department of Metallurgical Engineering.

**MANAGEMENT SCIENCE CONCENTRATION** under the 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.

**INSURANCE CONCENTRATION** under the General Business Option – This program enables the student to earn the B.B.A. degree while gaining an understanding of the principles underlying both life and casualty insurance and risk analysis.

*Business Advisor:* Dr. Jesse Pickrell.

**TEACHER CERTIFICATION** under the General Business or 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 Dawkins.

*Other:* The School of Education.

**ENGINEERING – SCIENCE CONCENTRATION** under the General Business Option – This program enables the student to earn the B.B.A. degree while gaining a basic introduction to the principles of engineering or science.

*Business Advisor:* Mr. G. C. Tompkins.

**SECRETARIAL CONCENTRATION** under the 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 Dawkins.

## 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 (117 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.

- 15 — ENGLISH 3101-02, 3211-12, or 3213-3214, or 3215-3216, 3269.
- 8 — MATHEMATICS 4110, 4111.
- 6 — POLITICAL SCIENCE 3110-11.
- 6 — HISTORY 3101-02.
- 8 — PHYSICS 4103-04.
- 15 — BIOLOGY 4110, 4202-03, 3401.
- 12 — MICROBIOLOGY 4202, 4302, 4460.
- 27 — CHEMISTRY 4103-04, 5213, 4224-25, 3430-3431.
- 10 — ZOOLOGY 3302, 3305, 4103.
- 9 — ELECTIVES.
- 117 — 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.

## 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. Course titles and descriptions are listed under Education.

## *Bachelor of Music*

**Major Subjects:** Music Theory and Composition; Music Education: Vocal or Instrumental Teaching; Applied Music: (1) Orchestral Instruments, (2) Organ, Piano, (3) Voice.

**Note for Music Majors:** Auditions in piano and voice are required of all music majors.

**Note for Minors in Music:** A minor in music requires participation in the ensemble of the major instrument (band, choir, orchestra), the number of semester hours depending on background of student.

**Note Concerning Music Theory:** A private interview and a proficiency test are required in Music Theory to determine the level of study.

**Minimum Semester Hours**

**GENERAL REQUIREMENTS FOR ALL MAJORS IN MUSIC**

- 12 — ENGLISH.
- 12 — MUSIC LITERATURE.
- 3 — SPEECH (not required in: 1. Music Theory and Composition and 2. Organ-Piano).
- 6 — HISTORY 3101-02.
- 6 — POLITICAL SCIENCE 3110-11.
- 16 to 20 — MUSIC THEORY 3114, 2111,\* 2112,\* 3213, 3214, 1211, 1212, 2315, 3411, or 3412.  
(Music Theory and Composition Majors: 19 additional hours; Piano and Organ Majors: 5 additional hours; Orchestral Instruments and Voice Majors: 2 additional hours.)
- 7 — MUSIC EDUCATION 1101, 3331 and 3333 or 3435 (*exception:* Music Theory and Composition requires only 1101 and 3331 or 3333. Piano and voice pedagogy required of piano and voice majors respectively).
- 3 — MUSIC 3113 (essentials of acoustics and music theory).
- 8 — FOREIGN LANGUAGE courses 4101-02. (Required of Voice Majors only.)

**APPLIED MUSIC:**

- A. 32 — for Majors in Music Theory and Composition: 18 semester hours, secondary level, of major instrument; 8 semester hours or equivalent, of piano; 6 semester hours of secondary instrument.
- B. 34 — for Applied Majors in Piano and Organ: 32 semester hours of piano or organ, secondary level; 2 semester hours, or minimum standards audition, of piano sight-reading.
- C. 40 — for Applied Majors in Orchestral Instruments: 32 semester hours of the major instrument, secondary level; 4 semester hours of piano, or equivalent; 4 semester hours of Chamber Music, or equivalent.
- D. 34 — for Applied Majors in Voice: 24 semester hours of Voice, secondary level; 8 semester hours, or equivalent, of piano; 2 semester hours of secondary instrument.
  - Participation in the ensemble of the major instrument (band for winds, orchestra for strings, choir for voice, piano and organ majors) each semester in residence. For exceptions, petition the Music Faculty.
  - Qualified bandmen, interested in directing orchestras, must meet minimum participation requirements in Orchestra. For details, consult with department head.
  - Recital participation and/or attendance is required each semester in residence, and considered as laboratory for other music courses.

**ELECTIVES:** Additional elective courses to make a minimum total of 123 semester-credit hours.

\* May be omitted by passing satisfactorily a proficiency examination.

## Teacher Education and Certification

Teacher training is one of the important purposes of The University of Texas at El Paso. Each teacher training 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 a Certification Officer in the School of Education. Each candidate for a permanent *provisional* certificate must complete the National Teacher Examination.

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, Music, and Speech and Drama. 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 71.
2. Secondary Education — there are two programs for this certificate, Programs A and B as outlined on page 72.
3. All-Levels Programs — these programs are described on pages 67, 68, and 69 of this catalog.
4. Mental Retardation — this program is described on page 70 of this catalog.
5. School Librarian.

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 in Elementary School.
5. Educational Supervisor in Secondary School.
6. Counseling and Guidance.

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

Direct questions concerning certificates to Coordinator of Teacher Education.

## *All-Levels Teacher Programs*

ART (Bachelor of Arts), DRAMA AND SPEECH (Bachelor of Arts),  
HEALTH & PHYSICAL EDUCATION (Bachelor of Arts), and MUSIC (Bachelor of Music).

An all-levels teaching field may be selected from the four 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 3101-02\* 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 — EDUCATION 3301, 3302, 3310, 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.

### DRAMA AND SPEECH

#### **ACADEMIC FOUNDATIONS (60 semester hours)**

##### **ARTS & SCIENCES (36 semester hours)**

- 12 — ENGLISH 3101-02\* 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.

\*A grade point average of not less than a 2.0 is required in both English 3101-02 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.

**DRAMA AND SPEECH (continued)**

- Semester Hours** DEGREE REQUIREMENTS AND ELECTIVES (24 semester hours)
- 3 — PHILOSOPHY 3203.
  - 3 — ART OF MUSIC.
  - 18 — ELECTIVES.

**PROFESSIONAL DEVELOPMENT**

- 18 — EDUCATION 3301, 3302, 3310, 3311, 3496, 3498.

**ACADEMIC SPECIALIZATION**

- 52 — 9 hours of Foundations courses in DRAMA and SPEECH.  
19 hours of SPEECH courses (chosen with the approval of a departmental advisor), including SPEECH 1101, 3210, 3333.  
21 hours of DRAMA courses: 3 hours of DRAMA 1111; 3 hours of Acting (DRAMA 3214, 3313); 3 hours of Directing (DRAMA 3325, 3326); 6 hours of Creative Dramatics (DRAMA 3351, 3352); 3 hours of Technical Theatre (DRAMA 3215, 3221, 3332, 3342); 6 hours of History and Criticism (DRAMA 3357, 3358, 3440).

A minimum total of 127 semester hours including 30 advanced hours.

**HEALTH AND PHYSICAL EDUCATION**

**ACADEMIC FOUNDATIONS (62 semester hours)**

**ARTS & SCIENCES (37 semester hours)**

- 12 — ENGLISH 3101-02\* and 3211-12 or 3213-14 or 3215-16.
- 6 — HISTORY 3101, 3102.
- 6 — POLITICAL SCIENCE 3110, 3111.
- 13 — BIOLOGY 4110, 4202; ZOOLOGY 4103; and 3 hours of MATHEMATICS.

**DEGREE REQUIREMENTS AND ELECTIVES (25 semester hours)**

- 9 — HEALTH EDUCATION 3101, and six semesters of physical education skill courses.
- 3 — SPEECH.\*
- 3 — PHILOSOPHY 3203.
- 6 — BIOLOGY 4203, 4301.
- 6 — ELECTIVES

**PROFESSIONAL DEVELOPMENT**

- 12 — EDUCATION 3301, 3310, 3311, and 3302 or 3306 or 3403.
- 6 — PHYSICAL EDUCATION 3496, 3498.

**ACADEMIC SPECIALIZATION**

- 36 — PHYSICAL EDUCATION 3103, 3205, 3206 (Men), 3207 (Men), 3215 (Women), 3316 (Women), 3303, 3304, 3305, 3311, 3312, 3409, 3414; HEALTH EDUCATION 3302.
- 24 — Second Teaching Field, 12 hours of which must be advanced. A minimum total of 129 semester hours including 30 advanced hours.

A minimum total of 127 semester hours including 30 advanced hours.

\*A grade point average of not less than a 2.0 is required in both English 3101-02 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****ACADEMIC FOUNDATIONS (60 semester hours)****Semester  
Hours****ARTS AND SCIENCES (36 semester hours)**

- 12 — ENGLISH 3101-02<sup>a</sup> 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.<sup>a</sup>
- 6 — MUSIC LITERATURE 3121 or 3122 and 3321 or 3322.
- 3 — MUSIC THEORY 3113 or 3114 (acoustics).
- 12 — ELECTIVES.

**PROFESSIONAL DEVELOPMENT**

- 12 — EDUCATION 3301, 3302 or 3306; and 3310, 3311 or 3420.
- 6 — MUSIC EDUCATION 3496, 3498.

**ACADEMIC SPECIALIZATION**

(Choral Plan 51 hours, Instrumental Plan 53 hours)

C	I	
PLAN	PLAN	(C — Choral Plan; I — Instrumental Plan)
13	—	MUSIC THEORY 1211, 1212, 3213, 3214, 2315, and 3411.
—	13	MUSIC THEORY 1211, 1212, 3213, 3214, 2315, and 3412.
12	12	MUSIC EDUCATION 3331, 3333, 3336, and 3433.
—	12	MAJOR INSTRUMENT (including a minimum of 2 advanced semester hours.)
—	6	PIANO.
—	2	VOICE.
—	8	Choice of 8 hours from: Reeds 2171, Brasses 2171, Percussion 2171, Low Strings 2171, High Strings 2171.
12	—	MAJOR INSTRUMENT (Voice, Piano, or Organ), (including a minimum of 2 advanced semester hours.)
8	—	SECONDARY INSTRUMENT (Voice or Piano).
6	—	Additional applied music.
—	—	Participation in the ensemble and participation in music recitals of the major instrument (band, orchestra, or choir) each semester in residence.

A minimum total of 129 (Choral Plan) or 131 (Instrumental Plan) semester hours.

<sup>a</sup> A grade point average of not less than 2.0 is required in both English 3101-02 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.

## 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

<i>Minimum Semester Hours</i>		<b>ACADEMIC FOUNDATIONS:</b>
PROGRAM A	PROGRAM B	
		<b>ARTS AND SCIENCES (36 semester hours)</b>
12	12	ENGLISH 3101-02* 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	FOREIGN LANGUAGE: Completion of 3201-02.
—	6	MATHEMATICS.
		<b>DEGREE REQUIREMENTS AND ELECTIVES</b> (30 semester hours)
6	—	EDUCATION 3101 or 3437, 3201.
3	3	SPEECH 3101,* 3103,*† or 3104*†.
6	—	Six semester hours from 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.

\* A grade point average of not less than 2.0 is required in both English 3101-02 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 training by having a degree plan made for the degree of bachelor of science in education, it will be necessary for him to satisfy certain Education Department screening requirements and secure a written recommendation for admission to teacher training from the Department. Acceptable standards must be maintained throughout the college career of the student as well as at the time of admission to teacher training.



*Bachelor of Science in Education*

ELEMENTARY EDUCATION

<i>Minimum Semester Hours</i>		
<u>PROGRAM A</u>	<u>PROGRAM B</u>	
66	66	<b>ACADEMIC FOUNDATIONS</b> ( see page 70 )
		<b>ACADEMIC SPECIALIZATION</b> , complete Plan I or II.
		PLAN I:
18	18	Teaching Subjects,* complete one teaching subject listed on page 73 under Teaching Subjects, Elementary Education, Plan I.
18	18	Combination Subjects,† complete 18 semester hours from the following: Art Education 3311, Drama 3350, English 3308, Mathematics 3302, Music Education 3334, Geography 3210, Physical Education 3205, Health Education 3302, English 3220, not more than 6 hours of mathematics and/or natural science.
		PLAN II:
24	24	Teaching Subject,* complete one teaching subject listed on pages 73 and 74 under Teaching Subjects, Elementary Education, Plan II.
12	12	Combination Subjects,† complete 12 semester hours from the following: Art Education 3311, Drama 3350, English 3308, Mathematics 3302, Music Education 3334, Geography 3210, Physical Education 3205, Health Education 3302, English 3220, not more than 6 hours of mathematics and/or natural science.
		<b>PROFESSIONAL DEVELOPMENT</b>
18	18	EDUCATION 3301, 3302, 3306, 3403, 3496-97.
		<b>ELEMENTARY CONTENT.</b>
12	12	From: EDUCATION 3303, 3304, 3305, 3404, 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	<b>ACADEMIC FOUNDATIONS</b> (see page 70)
48	48	<b>ACADEMIC SPECIALIZATION</b> , complete Plan I or II.

**PLAN I:**

Secondary Teaching Fields,\* complete two teaching fields listed on pages 74 and 75 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 75 under Composite Teaching Fields, Secondary Education, Plan II. (A grade average of not less than 2.5 is required in the composite teaching field.)

### PROFESSIONAL DEVELOPMENT

18	18	EDUCATION 3310, 3312 or 3408, 3420, 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.

*Minimum Semester Hours*

### MENTAL RETARDATION

- Complete all requirements in Program A or B in Elementary Education (see page 71) except for Electives in Academic Foundations (see page 70).
- 12 — EDUCATION 3409, 3421, 3422, 3429.
- § — ELECTIVES to make a minimum of 132 semester hours.

§ 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 this program.

## 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
SPEECH – Six hours of foundation courses in Speech; Speech 3210, 3333, plus 6 advanced hours in Speech . . . . .	Total: 18 hours
ECONOMICS – Economics 3203, 3204, 3302 or 3303, plus 9 advanced hours . . . . .	Total: 18 hours
GEOLOGY – Geology 3103, 3104, 3205, 3305, 3405, and 3410 . . . . .	Total: 18 hours
GOVERNMENT – Government 3110, 3111, plus 12 hours of which 9 are advanced . . . . .	Total: 18 hours
HEALTH AND PHYSICAL EDUCATION – P.E. 3103, 3203, 3205, 3303, 3414; H.E. 3302 . . . . .	Total: 18 hours
HISTORY – History 3101, 3102, 3201 or 3202, plus 9 advanced hours . . . . .	Total: 18 hours
MATHEMATICS – Mathematics 3101, 3102, 3201, plus 9 advanced hours . . . . .	Total: 18 hours
PSYCHOLOGY – Psychology 3101 and 6 hours from: 3103, 3202, 3204, or 3206, plus 3302, 3308, 3406 . . . . .	Total: 18 hours
PHYSICS – Physics 4115, 4216, 4216, plus 9 advanced hours . . . . .	Total: 18 hours
READING . . . . .	Total: 18 hours
SOCIOLOGY – Sociology 3101, 3102, 3214, 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 4110, 3304; Zoology 4103, 3303; Botany 4103, 3301; plus 6 hours from Zoology 4304, 3430, Botany 3304 . . . . .	Total: 26 hours
CHEMISTRY – Chemistry 4103-04, 5213, 4221, 4322; plus 4 advanced hours . . . . .	Total: 25 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 3101-02, 3211-12, 3309, 3311-12, plus three additional hours of advanced English. (If the student was exempted from English 3101 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 either French 3110 or 3111. Senior French examinations by Modern Languages Department required . . . . .	Total: 26 hours
GEOLOGY – Geology 3103, 3104, 3205, 3210, 3305, 3405, 3410 plus 3 advanced hours from Geology 3325, 3359, 3455, 3460, 3462, or 3466 . . . . .	Total: 24 hours

GERMAN – German 4101-02, 3201-02, 3357, plus nine advanced hours. Senior German examinations by Modern Languages Department required . . . . .	Total: 26 hours
GOVERNMENT – Government 3110, 3111, plus 18 hours of which 12 are advanced . . . . .	Total 24 hours
HEALTH AND PHYSICAL EDUCATION – P.E. 3103, 3205, 3303, 3304, 3312, 3414; H.E. 3101, 3302 . . . . .	Total: 24 hours
HISTORY – History 3101, 3102, 3201, 3202, plus 12 advanced hours . . . . .	Total: 24 hours
MATHEMATICS – Mathematics 3115, 2116, 4111, 4212, plus 12 advanced hours . . . . .	Total: 25 hours
PHYSICS – Physics 4115, 4216, 4217, 1216, plus 12 advanced hours . . . . .	Total: 25 hours
SOCIOLOGY – Sociology 3101, 3102, 3212, 3214, 3327, 3352, 3336, 3358 . . . . .	Total: 24 hours
SPANISH – Spanish 4101-02, 3201-02, 3357, 3400, plus three hours from Spanish Literature; plus three hours from Spanish American Literature. Non-native speakers are advised to complete three hours from Spanish 3110, 3111, 3114. Senior Spanish examination by Modern Languages Department required . . . . .	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 – Botany 4103, 3301; Zoology 3303; Biology 3304; Microbiology 4202; plus (Biology 4202 and 6 hours) or (Zoology 5201 and 3 hours) from: Zoology 4304, 3305, 4306; Microbiology 4302, 3333, 3223; Biology 3314; Botany 3320. Completion of Biology 4110 and Zoology 4103 under Academic Foundations . . . . .	Total: 24 or 25 hours
GENERAL BUSINESS – 15 semester hours from the following: Accounting 3101, 3102, Finance 3310, Marketing 3201, Office Management 3203, Personnel Management 3201, Statistics 3201, Business Law 3301; plus 9 hours of elective business administration courses to make a total of 12 semester hours of advanced credit . . . . .	Total: 24 hours
CHEMISTRY – Chemistry 4103-04; 5213, 4221, 4322; plus 4 advanced hours . . . . .	Total: 25 hours
DRAMA – Drama 3113; 3 hours of Drama 1111; 3 hours of Acting (Drama 3213, 3214); 3 hours of Directing (Drama 3325, 3425), 6 hours of Technical Theatre (Drama 3215, 3221, 3332, 3342); and 6 hours of History and Criticism (Drama 3357, 3358, 3440) . . . . .	Total: 24 hours
ENGLISH – English 3101-02, 3211-12, 3309, 3311-12, 3419. (If the student was exempted from English 3101 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
GEOLOGY – Geology 3103, 3104, 3205, 3210, 3305, 3405, 3410, plus 3 advanced hours from 3325, 3359, 3455, 3460, 3461, 3462, or 3466 . . . . .	Total: 24 hours
FRENCH – French 4101-02, 3201-02, 3357, plus nine advanced hours. Completion of 4101-02 in a second language under Academic Foundations. Senior French examination by Modern Languages Department required . . . . .	Total: 26 hours

EDUCATION MAJORS

GERMAN — German 4101-02, 3201-02, 3357, plus nine advanced hours. Completion of 4101-02 in a second language under Academic Foundations. Senior German examination by Modern Language Department required . . . . .	Total: 26 hours
<b>HEALTH AND PHYSICAL EDUCATION —</b>	
Physical Education 3103, 3206 or 3207 (Men), 3303, 3304, 3311, 3312, 3316 (Women), 3414, H.E. 3401, and six semesters of Skill Courses . . . . .	Total: 30 hours
HISTORY — History 3101, 3102, 3201, 3202, plus 12 advanced hours . . . . .	Total: 24 hours
JOURNALISM — Journalism 4207, 3201, 3202, 3305, 3312, 3350, 3352; Publications 1104, and 1204 . . . . .	Total: 24 hours
MATHEMATICS — Mathematics 3115, 2116, 4111, 4212, plus 12 advanced hours . . . . .	Total: 25 hours
PHYSICS — Physics 4115, 4216, 4217, 1216, 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 3101 or 3498, 3102, 3103, or 3499, 3104, 3203; plus 9 hours from the following: Office Management 3301, 3302, 3303, 3304, Personnel Management 3301, including enough advanced courses to make a total of 12 semester hours of advanced credit . . . . .	Total: 24 hours
SPANISH — Spanish 4101-02, 3201-02, 3357, 3400; plus three hours from Spanish Literature; plus three hours from Spanish American Literature. Completion of 4101-02 in a second language under Academic Foundations. Senior Spanish examination by Modern Languages Department required . . . . .	Total: 26 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

### *Composite Teaching Fields: Secondary Education*

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

<b>SCIENCE</b> — Thirty hours from Zoology 4103, 5201; Botany 3210; Microbiology 4202; Chemistry 4104, 5213; Geology 3103-04, 3205; Physics 4216, 1216, 4217.	
<i>Completion of one of the following:</i>	
(1) Botany 3301; Microbiology 4302; Zoology 3301; plus 9 hours from Zoology 4304, 3304; Microbiology 4460;	
(2) Geology 3305, 3405, 3410, plus 9 advanced hours from: 3455, 3460, 3461, 3466.	
(3) Physics 3325, plus 15 advanced hours.	
(4) Chemistry 4221, 4322, 3330, 3331, plus 4 advanced hours . . . . .	Total: 48 hours
<b>SOCIAL STUDIES</b> — History 3101, 3102, 3201, 3202, plus twelve advanced hours; Government 3111, plus three advanced hours; Sociology 3101, 3102, plus three advanced hours; Economics 3204, plus three advanced hours; Geography 3210 . . . . .	
	Total: 48 hours
<b>SINGLE TEACHING FIELD: ENGLISH</b> — <i>Prerequisite:</i> English 3101, 3102, 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, 3306, Either Drama 3113 or Speech 3333.	



## THE GRADUATE SCHOOL



*(The Graduate School publishes a separate bulletin with complete details)*

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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.

### **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 transcripts. Graduates of other colleges must provide three complete transcripts — one for the office of the Registrar, and two for the office of the Dean. The application for admission to a degree program cannot be acted upon until these transcripts have been received and the applicant has been admitted to the University.

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 area. 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 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.

Students from non-English-speaking foreign countries must make a satisfactory score on the Test of English as a Foreign Language (TOEFL) and the Aptitude and Advanced tests of the Graduate Record Examination BEFORE admission to graduate school will be granted.

**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 of The University of Texas. Issued from the Educational Testing Service at Berkeley, California, and taken at the applicant's own expense, it 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 of Texas 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. Since applications for the tests must be received in Berkeley 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.

### **Transfer of Credits**

Acceptance of graduate credits from another institution, except The University of Texas or one of its branches, may not exceed six semester hours, and is subject to approval by the committee on graduate studies in the student's major areas and the dean.

### **Undergraduate Students Taking Work for Graduate Credit**

An undergraduate student who lacks no more than twelve semester hours of the requirements for a bachelor's degree may, upon petition to the Dean, take courses for graduate credit.

### **Graduate Load for Employed People**

Students who are employed in full-time positions should be limited to three semester hours of work each semester. With the written approval of the Dean, as much as six semester hours of graduate credit for one semester may be approved; however, nine semester hours is the maximum that may be approved for one academic year.

### **Second Degree**

A student who wishes to qualify for a second Master's Degree may not count courses used in completing his first degree. He must take a full program of new courses. A graduate student seeking a second Bachelor's Degree will register as an undergraduate.

### **Special Requirements**

For grade requirements, thesis requirements, special departmental requirements, graduation requirements, and other regulations applying to graduate students, see the Graduate Bulletin.

## **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, 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.
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## **MASTER OF EDUCATION DEGREE**

### **A. General Requirements for All Programs.**

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

### **B. Requirements for the program for the Professional School Administration Certificate.**

1. Completion of the M.Ed. and professional teaching certificate as indicated under "D" or "E" below. 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: Education 3533, plus twenty-one semester hours from Education 3502, 3524, 3525, 3526, 3528, 3529, 3530, 3531, 3532.

### **C. Requirements for the programs of Elementary Supervision, Secondary Supervision, and Counseling.**

#### **ELEMENTARY SUPERVISION:**

1. Education 3502, 3503 or 3523, 3504, 3508, 3513, 3514, 3524, 3528, plus six hours of electives in Education.
2. 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.



**SECONDARY SUPERVISION:**

1. Education 3502, 3503 or 3523, 3504, 3509, 3511, 3517 or 3538, 3524, 3532, plus six hours of electives in Education.
2. Six hours credit from one of the minors listed above under Elementary Supervision.

**COUNSELING:**

1. Education 3435, 3502, 3504, 3518, 3519, 3520, 3522, plus six hours of graduate courses in Education (Education 3420 must be taken if not completed as part of the undergraduate program).
2. Six hours credit from one of the minors listed above under Elementary Supervision.

**D. Requirements for the program in Elementary Teaching for students who wish to qualify for the Professional Certificate.\***

1. 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 is required in the selected elementary subject.
2. Professional Development Area: Six semester hours from Education 3504 and either 3513 or 3514.
3. Resource Area: Six semester hours.
4. Electives: Twelve semester hours approved by the head of the Department of Education, of which at least six must be in Education.

**E. Requirements for the program in Secondary Teaching for students who wish to qualify for the Professional Certificate.\***

1. 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, Geology, Political Science, Health and Physical Education, History, Music, Physics, and Spanish. At least twenty-four semester hours of undergraduate credit is required in the selected secondary teaching field.
2. Professional Development Area: Six semester hours from Education 3504 and either 3511 or 3517 or 3538.
3. Resource Area: Six semester hours.
4. Electives: Twelve semester hours approved by the head of the Department of Education, of which at least six must be in Education.

**F. Requirements for the program in Elementary Teaching for students who do not wish to qualify for the Professional Certificate.\***

1. 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.

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

2. Professional Development Area: Six semester hours from Education 3504, 3513 or 3514. The Graduate Dean may in individual cases approve substitutions.
3. Resource Area: Six semester hours.
4. Electives: Twelve semester hours approved by the Dean of the Graduate Division, of which at least six must be in Education.

**G. Requirements for the program in Secondary Teaching for students who do not wish to qualify for the Professional Certificate.\***

1. 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 is required in the selected secondary teaching field.
2. Professional Development Area: Six semester hours from Education 3504, 3511, or 3517. The Graduate Dean may in individual cases approve substitutions.
3. Resource Area: Six semester hours.
4. Electives: Twelve semester hours approved by the Dean of the Graduate Division, of which at least six must be in Education.

**H. 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.**

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**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.

**(See the Graduate Bulletin for complete details)**

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

## ***Courses Offered . . .***

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Accounting . . . . .	84	French . . . . .	166
Anthropology . . . . .	194	Geography . . . . .	195, 211
Art . . . . .	132	Geology . . . . .	207
Bible . . . . .	135	German . . . . .	168
Biology . . . . .	198	History . . . . .	152
Botany . . . . .	199	Japanese . . . . .	168
Business . . . . .	86	Latin . . . . .	168
Chemistry . . . . .	204	Library Services . . . . .	100
Drama . . . . .	137	Mass Communication:	
Economics and		Broadcasting . . . . .	161
Finance . . . . .	93	Journalism . . . . .	159
Education:		Mathematics . . . . .	213
Curriculum and		Microbiology . . . . .	200
Instruction . . . . .	98	Military Science . . . . .	163
Educational		Music . . . . .	172
Administration . . . . .	103	Music Education . . . . .	174
Educational		Philosophy . . . . .	180
Psychology and		Physics . . . . .	217
Guidance . . . . .	104	Political Science . . . . .	182
Health & Physical		Psychology . . . . .	187
Education . . . . .	107	Russian . . . . .	169
Engineering:		Sociology . . . . .	191
Civil . . . . .	112	Spanish . . . . .	169
Electrical . . . . .	117	Speech . . . . .	139
Mechanical . . . . .	122	Zoology . . . . .	201
Metallurgical . . . . .	126		
English . . . . .	145		

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## ☞ *Explanation of Course Numbering System* ☞

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### 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 eighteen weeks, unless otherwise specified in the course description. For each classroom hour two hours of preparation are expected. 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

Laboratory and other special fees for individual courses are indicated on a per-semester basis in parenthesis following course titles:

#### **GEOLOGY**

**4206 Introductory Weather and Climate (\$2) (3-3)**

#### **CHEMISTRY**

**4103-04 General Chemistry (\$6-\$7) (3-4)**

*(Two Semesters – Two Fees)*



**School of**  
**Business Administration**

JOHN M. RICHARDS, *Dean*

L. PHILLIPS BLANCHARD, *Assistant Dean*



# SCHOOL OF BUSINESS ADMINISTRATION

## ACCOUNTING

G. R. BOVARD, *Head*

*Associate Professors* BOVARD, BURCHARD, PATE; *Assistant Professors* BUCKNER, FLYNT, MACDONALD, RYLANDER, SANDERS; *Part Time Instructors* FRUTHANDLER, KAUFMAN, WARD.

- 3101 Principles of Accounting I (\$2) (3-1)**  
Introductory study of the double entry accounting system. Analysis and recording of business transactions; preparation of financial statements applicable to proprietorship and partnership accounting. Problems and practice set. (Voluntary Lab).
- 3102 Principles of Accounting II (\$2) (3-1)**  
A continuation of accounting principles. Study of the partnership and corporate forms of the business entity with an introduction to taxes (payroll, property, and income), the cost system (job order, process cost, and standard cost), and financial statement analysis. *Prerequisite:* Accounting 3101. (Voluntary Lab).
- 3201 Intermediate Accounting I (3-0)**  
Critical analysis of the balance sheet accounts. Introductory analysis of income statement expense and revenue accounts with emphasis on the matching process. Problems keyed to studies made by professional accounting societies. *Prerequisite:* Accounting 3102.
- 3202 Intermediate Accounting II (3-0)**  
Completion of the critical study of balance sheet accounts. Continuing intensive analysis of financial statements. Emphasis on comparative analysis of tabulated data, special ratios and measurement, funds and cash flow statements, and accounting for price level changes. *Prerequisite:* Accounting 3201.
- 3205 Managerial Accounting (3-0)**  
Fundamental techniques of dynamic cost and profit control. Primary emphasis on responsibility accounting. Problems in managerial planning budgets, variable expenses, cost-volume-profit analysis, and budget reports. *Prerequisite:* Accounting 3102.
- 3301 Cost Analysis I (3-0)**  
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. *Prerequisite:* Accounting 3102.
- 3302 Cost Analysis II (3-0)**  
Fundamental techniques of expense allocation are more fully developed. Emphasis on determining standard costs, budgetary control, variance analysis, and cost and profit analysis for management decision making. *Prerequisite:* Accounting 3301.
- 3303 Management Services — Systems Design (3-0)**  
Analysis of fundamental accounting systems. Emphasis on systems design; relationship of system and organization; objectives, policies, procedures, and plans. Field trips scheduled to selected business offices in problem analysis of operating systems. *Prerequisite:* Accounting 3202.
- 3304 Management Services — Electronic Data Processing (\$5) (3-1)**  
Punch card tabulating; electronic data processing; principles and problems of accounting systems planning, organization, and control in internal procedures, auditing, and analysis. *Prerequisite:* Accounting 3102.
- 3306 Governmental and Institutional Accounting (3-0)**  
Study of the specialized procedures and unique methods of fund accounting for governmental units and private institutions. Problems in actuarial science. *Prerequisite:* Accounting 3102.

- 3307 Federal Tax — Individuals (3-0)**  
Intensive study of the tax structure as stated public policy. Ethical implications of tax policy interpretations. Emphasis on the current income tax code with problem analysis and preparation of income tax returns for individuals. *Prerequisite:* Accounting 3102.
- 3308 Federal Tax — Partnerships and Corporations (3-0)**  
Analysis of the current Federal Income Tax code in relation to partnerships and corporations including problems and preparation of tax returns. Analysis of federal gift, estate, and inheritance tax structure. *Prerequisite:* Accounting 3307.
- 3309 Survey of Accounting Principles, Techniques, and Concepts (3-0)**  
(Open only to Non-B.B.A. students). A non-technical approach to Accounting, emphasis is on use of financial statements, evaluation of Cost Accounting Reports, Budgets and Variances. Survey of Governmental Accounting or Accounting for non-profit organizations.
- 2310-3310 Accounting Internship (2-0) (3-0)**  
Practicum with C.P.A. or Industrial firms. Two hour seminar per week during internship. *Prerequisite:* Accounting 3202 and permission of Director.
- 3401 Advanced Accounting (3-0)**  
Designed to prepare the student for special problems in accounting; consolidations, fiduciaries, consignment sales, liquidations and dissolutions of partnerships, estates and trusts. *Prerequisite:* Accounting 3202.
- 3404 Auditing Principles and Procedures (3-0)**  
Public accounting firm organization and operation; internal control and internal auditing; verification of balance sheet and operating accounts; auditors reports and opinions. *Prerequisite:* Accounting 3202.
- 3496 Managerial Tax Planning (3-0)**  
Federal Income tax as it affects accounting and auditing. Stress is upon those basic provisions of the law that create accounting problems. Although attention is given to the income tax imposed on individuals, major emphasis is placed upon the income tax problems of corporations, partnerships, individual proprietorships and fiduciaries. Problem areas include depreciation, inventories, capital gains and losses, operating losses, and similar topics. *Prerequisite:* Accounting 3307.
- 3497 C.P.A. Problem Review (3-0)**  
Advanced accounting problems on flow of funds, fiduciaries, business combinations, actuarial science, corporation capital, and partnerships. A study of past examinations and current periodicals. *Prerequisite:* Twelve hours of advanced Business Administration including Intermediate Accounting.
- 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:* Twelve hours of advanced Business Administration, including intermediate accounting.

## B U S I N E S S

JESSE F. PICKRELL, *Head*

*Professors* BAYLOR, DAWKINS, GEORGE, HARTRICK, PICKRELL; *Associate Professors* BLANCHARD, DILLMAN, STENICKA; *Assistant Professors* FREELAND, GIFFORD, TOMPKINS; *Instructors* DAWSON, SHANBLUM, SIPES; *Part-time Instructors* AKARD, BRADY, GARRISON, GREEN, HALLIDAY, KERN, NEILL, REYNOLDS, THURMAN.

**B.B.A. Degree** — See page 61 for degree requirements.

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

### GENERAL BUSINESS

**3101 Development of American Industry (3-0)**

A comparative analysis of the major industries in the United States. Selected motion pictures, slides, and audio tapes are used to teach the factors of integration and rationalization of each industry; fundamental development of the problem-solving technique with qualitative data.

**3102 Introduction to Data Processing (\$2) (3-1)**

An introductory course designed to familiarize the student with basic principles related to the association of Electronic Data Processing and its application to business and economics.

**3202 Owning and Operating a Small Business (3-0)**

A study of steps essential in planning, organizing, and operating a single proprietorship or partnership enterprise. Special emphasis on meeting local, state, and federal requirements; locating, financing, insuring, accounting, and merchandising for profit. *Prerequisite:* Sophomore standing or approval of the department Head.

**3203 Introduction to Computers (\$2) (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.

**3204 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.

**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.

**3302 Life Insurance (3-0)**

A detailed study of economic bases of life insurance, types of life insurance and annuity contracts, calculation of premium rates, reserve systems, surplus and its distribution, policy provisions.

**3303 Property Insurance (3-0)**

Detailed study of fire insurance, protection of mortgagee's interest, consequential loss coverage, allied fire lines, and fire insurance rates; ocean and inland marine insurance; and multiple-line contracts.



- 3304 Casualty Insurance (3-0)**  
Detailed study of automobile insurance; business, professional, and personal liability insurance; burglary, robbery, and theft insurance; fidelity and surety bonds; health insurance; multiple-line contracts; and miscellaneous casualty coverages.
- 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.
- 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.
- 3402 Business Policy and Management Laboratory (3-0)**  
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.
- 3403 Life and Health Insurance Seminar (3-0)**  
Advanced insurance topics designed to round out the student's knowledge of life and health insurance. Discussion of business insurance, private pension plans, social retirement systems, group life and health insurance coverages, programming, current problems and developments. *Prerequisite:* Consent of the instructor.

## BUSINESS LAW

- 3301 Business Law I (3-0)**  
Designed to introduce the student to the legal environment in which business decisions are made with an intensive study of contracts.
- 3304 Business Law II (3-0)**  
A continuation of Business Law 3301 with emphasis on the Uniform Commercial Code. *Prerequisite:* Business Law 3301.
- 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

- 3201 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.
- 3301 Advanced Marketing (3-0)**  
Legal, economic, and social aspects of the marketing process. Analysis of the role of marketing management; governmental regulations, pricing policies and practices, the selection of distribution channels, sales promotion, and market analysis. *Prerequisite:* Marketing 3201.

*School of Business Administration*

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**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 3201.

**3303 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:* Marketing 3201. Marketing 3303 and Journalism 3350 may not both be counted for credit.

**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 3201.

**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 3201.

**3306 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 3201.

**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:* Sophomore standing or approval of the department Head.

**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 3301 and six advanced hours in Marketing.

**OFFICE MANAGEMENT AND BUSINESS EDUCATION**

**3101 Typewriting I (\$2) (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 (\$2) (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.

**3103 Shorthand I (\$2) (3-2)**

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

**3104 Shorthand II (\$2) (3-2)**

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

- 3203 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.
- 3301 Transcription (\$2) (3-2)**  
Transcription of mailable business correspondence, vocabulary building, sustained dictation and transcription practice for secretarial efficiency. *Prerequisite:* Office Management 3104.
- 3302 Office Problems and Procedures (\$2) (3-2)**  
Secretarial procedures including: processing of mail, filing and records control, procuring of office supplies, receiving calls and callers, handling travel arrangements, preparing business reports, developing business reports, developing personal and professional qualities of the career secretary. *Prerequisite:* Office Management 3101 or approval of Department Head.
- 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 (\$6) (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.

**PERSONNEL MANAGEMENT AND INDUSTRIAL RELATIONS**

- 3201 Principles of Management (3-0)**  
Study and application of the concepts of management in business organization and operation. The student's attention is focused on the universality of management functions in all phases of business in his search for a practical philosophy of management.
- 3301 Personnel Management and Industrial Relations (3-0)**  
Survey of policy, procedure and practice in major areas of the Personnel-Industrial Relations field, including employment, training, labor relations, wages and incentives, benefits and services, program research and evaluation.
- 3302 Industrial Psychology (3-0)**  
Psychological applications to business organizations. Primary emphasis upon research findings in Personnel Administration areas such as selection, training, group relations, employee evaluation motivation, work environment. Also attention to other areas of Industrial Psychology such as human engineering, advertising and public relations. *Prerequisite:* Personnel Management 3301.
- 3303 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:* Personnel Management 3301.
- 3304 Organization Staffing (3-0)**  
Detailed consideration of programs and methods in procurement, selection, assessment, and development of an organization's manpower resources. Areas include psychological testing, interviewing, and related employment techniques, counseling and employee appraisal training and development plans. *Prerequisite:* Personnel Management 3301 and Statistics 3301.

**3402 Wage and Salary Administration (3-0)**

Method and procedure for establishing rational wage structure both internal and external to the firm, including job description and specifications, qualitative and quantitative evaluation processes, continued administration, and labor attitude toward job evaluation. *Prerequisite:* Personnel Management 3301.

**PRODUCTION MANAGEMENT**

**3301 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.

**3302 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:* Production Management 3301 and Statistics 3301.

**3303 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:* Production Management 3301.

**3304 Operations Research — Managerial (\$2) (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:* Production Management 3301.

**3305 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:* Production Management 3301.

**3306 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:* Personnel Management 3201.

**STATISTICS AND QUANTITATIVE ANALYSIS**

**3201 Fundamentals of Statistics (\$2) (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 (\$2) (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.
- 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

*Prerequisite* for courses listed below: Senior or Graduate standing.

#### MARKETING

- 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

- 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.

#### PERSONNEL MANAGEMENT AND INDUSTRIAL RELATIONS

- 3498 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:* Senior standing and six hours of advanced Personnel Management courses or Graduate standing.

**3499 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:* Senior standing and six hours of advanced Personnel Management courses or Graduate standing.

**PRODUCTION MANAGEMENT**

**3498 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:* Production Management 3301 and three hours of advanced Production Management.

**3499 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:* Production Management 3301 and three hours of advanced Production Management.

**STATISTICS AND QUANTITATIVE ANALYSIS**

**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 &amp; FINANCE

PAUL E. FENLON, *Head*

*Professors* FENLON, RICHARDS; *Associate Professors* BRAND, DURIEZ, HOOKER;  
*Assistant Professors* CHAPLIN, FRASER, JAMES, NEILL, WILLARD.

## ECONOMICS

**B.A. Degree** — Specific requirements for the economics major are: Economics 3203, 3204, 3302, 3303, twelve additional hours of economics, three hours of accounting, and three hours of statistics, as approved by the Department.

## For Undergraduates

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

**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)**

[Formerly 3304]

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 3204.

**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.

**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 Head.

## For Undergraduates and Graduates

**3301 Economic Development of the United States (3-0)**

[Formerly 3210]

Survey of American economic development from colonial time to present; analyses of factors which have shaped that development. *Prerequisite:* Economics 3203.

**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.

**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.

**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. *Prerequisite:* Economics 3203.

- 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. *Prerequisite:* Economics 3203.
- 3340 Economics of Labor (3-0)** [Formerly Labor Problems]  
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. *Prerequisite:* Economics 3203.
- 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. *Prerequisite:* Economics 3203.
- 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. *Prerequisite:* Economics 3204.
- 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. *Prerequisite:* Economics 3204.
- 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. *Prerequisite:* Economics 3203.
- 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. *Prerequisite:* Economics 3203.
- 3370 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 and six hours of Mathematics.
- 3371 Mathematical Economics (3-0)**  
Basic concepts and operations of mathematical logic and their application to economic analysis. *Prerequisite:* Economics 3204 and six hours of Mathematics.
- 3380 History of Economic Thought (3-0)**  
A study of the development of principal economic doctrines and schools of economic thought. *Prerequisite:* Economics 3203.
- 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. *Prerequisite:* Economics 3203.
- 3390 Comparative Economic Systems (3-0)**  
Economic foundations of the capitalistic and other systems: economic attributes of fascism, socialism, communism, and capitalism. *Prerequisite:* Economics 3203.
- 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.

**3472 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, 6 hours of Mathematics and senior standing or consent of instructor.

**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 Head.

**FOR GRADUATE STUDENTS ONLY**

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

**3502 Seminar in Microeconomic Theory**

**3503 Seminar in Macroeconomic Theory**

**3510 Seminar in Economic History**

**3520 Seminar in Monetary and Fiscal Policies and Problems**

**3550 Seminar in Social Control of Business**

**3560 Seminar in International Economics**

**3565 Seminar in Economic Development**

**3566 Seminar in Latin American Economics**

**3570 Seminar in Advanced Quantitative Methods in Economics**

**3580 Seminar in Development of Economic Thought**

**3598-99 Thesis**

**FINANCE**

**For Undergraduates and Graduates**

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

**For Undergraduates and Graduates**

**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. *Prerequisite:* Accounting 3101-3102, or consent of instructor.

**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.

**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.

**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.

**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 Head.



# School of Education

JOHN W. MCFARLAND, *Dean*

W. GERALD BARBER, *Assistant Dean*



# SCHOOL OF EDUCATION

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## CURRICULUM AND INSTRUCTION

OSCAR T. JARVIS, *Head*

J. PAUL SCARBROUGH, *Coordinator of Professional Laboratory Experiences*;  
*Professors* BURMEISTER, BURNS, CARTER, CLINE, JARVIS, PAST;  
*Associate Professors* ARMSTRONG, EKWALL, SCARBROUGH, UXER; \*  
*Assistant Professors* AHO, BENSON, \* D. BROWN, V. DAVIS, HARRELL, \*  
LOWRANCE, G. MILLER, SELIG, WAGNER, D. WILLIAMS;  
*Instructors* BARKER, GOBEL, LAWRENCE, MUNN, RICE, STEVENS, WARD;  
*Part-time Instructors* ARNOLD, MYERS.

### 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:* Education 3301.
- 3304 Science in the Elementary School (3-0)**  
Content, materials, and methods of teaching science in the elementary school. *Prerequisite:* Education 3301.
- 3305 Children's Literature in the Elementary School (3-0)**  
Children's literature and the administration of the recreational reading program in relations to the content subjects in the elementary school. Special reading may be done at the level in which the student is most interested. *Prerequisite:* Education 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:* Education 3301 and 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 Arithmetic in the Elementary School (3-0)**  
Content, materials and methods of teaching arithmetic 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.

\**Visiting*

- 3496 Professional Laboratory Experience in the Elementary School (1.5-7.5)**  
 A minimum of seven and one-half hours per week for one semester of laboratory observation and teaching experience in an elementary school classroom. *Prerequisite:* Permission of Coordinator of Professional Laboratory Experiences during the spring semester preceding the year when the course will be taken.
- 3497 Professional Laboratory Experience in the Elementary School (1.5-7.5)**  
 A minimum of seven and one-half hours per week for one semester of laboratory teaching experience in an elementary school classroom. To be taken concurrently with Education 3496, except in an all-levels program.

## 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:* Education 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.
- 3367 Teaching Secondary-School Mathematics (3-0)**  
 The content and development of algebra and geometry will be critically analyzed via the use of methods of proof using induction and deduction. Selection and use of materials will be discussed. Research on discovery and meaningful verbal learning will be surveyed with emphasis on the implications for teaching.
- 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.
- 3498 Professional Laboratory Experience in the Secondary School (1.5-7.5)**  
 A minimum of seven and one-half hours per week for one semester of laboratory observation and teaching experience in a secondary school classroom. *Prerequisite:* Permission of the Coordinator of Professional Laboratory Experiences of the School of Education. (Application must be filed with the Coordinator of Professional Laboratory Experiences during the spring semester preceding the year when the course will be taken.
- 3499 Professional Laboratory Experience in the Secondary School (1.5-7.5)**  
 A minimum of seven and one-half hours per week for one semester of laboratory teaching experience in a secondary school classroom. To be taken concurrently with Education 3498, except in the all-levels program.

## 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.

*School of Education*

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- 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 schools.
- 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.
- 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.

## *Library Services*

*(Sponsored by the School of Education)*

- 3301 Survey of School Library Services (3-0)**  
Topics include the role and services of the library in the school, simplified cataloging and classification of materials (Dewey Decimal System), procedures in planning the library and supervision of staff. *Prerequisite:* Junior standing.
- 3302 Survey of School Library Services (3-0)**  
Continuation of 3301. *Prerequisite:* Library Services 3301 or concurrent registration in 3301.
- 3303 Books for Elementary School Libraries (3-0)**  
Survey of literature for elementary school students and of their reading interests. Comprehensive examination of bibliographic tools to be used as guides to the selection of books, periodicals, and other materials for elementary school libraries. *Prerequisite:* Junior standing.
- 3304 Books for High School Libraries (3-0)**  
Survey of literature for high school students and of their reading interests. Comprehensive examination of bibliographic tools to be used as guides to the selection of books periodicals, and other materials for high school libraries. *Prerequisite:* Junior standing.
- 3305 Children's Literature in the Elementary School (3-0)**  
Same as Education 3305. *Prerequisite:* Junior standing.
- 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 Observations and Practice (0-7.5)**  
A minimum of ten hours per week for one semester of laboratory observation and school library experience in a school library. *Prerequisite:* Twelve hours credit in Library Services; permission of instructor in advance.

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.
- 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:* Education 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:* Education 3404; may not be taken for credit by those who have taken Education 3580.

FOR GRADUATE STUDENTS ONLY

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

- 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:* Education 3502.
- 3506 Remedial Reading in the Elementary School (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.
- 3507 Educational Sociology (3-0)**  
A survey of the field of educational sociology and its application to problems in modern education.
- 3508 Workshop in 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 Workshop in Instructional Problems (Secondary) — Seminar (3-0)**  
Same as Education 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*

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- 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 in the Elementary Grades (3-0)**  
Actual laboratory experience for application of concepts, media and evaluation, to meet reading disadvantages in the elementary grades. *Prerequisite:* Education 3404, 3506. May be repeated for credit.
- 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:* Graduate standing; Education 3404, 3506, or equivalent courses.
- 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:* Graduate standing; Education 3404 or the equivalent and permission of the instructor.
- 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:* Education 3404 or 3408.
- 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:* Education 3404 or 3500, and 6 credits in reading.
- 3543 Problems in Reading — Seminar (3-0)**  
*Prerequisite:* Education 3542 or 3502 and 6 credits in reading.
- 3551 Seminar in Secondary 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:* Education 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:* Education 3404. (May not be taken for credit by those who have taken 3480.)



EDUCATIONAL ADMINISTRATION

Professors FOSTER, MCFARLAND, MEADOWS;  
Associate Professor BARBER; Assistant Professors G. BROOKS, EVANS.

FOR GRADUATE STUDENTS ONLY

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

- 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

CARL WALKER, *Head*

*Professors* DAY, HIMELSTEIN;

*Associate Professors* E. DAVIS, C. WALKER, J. R. WALKER;

*Assistant Professors* B. BROOKS, HAMILTON, LANDRUM; *Instructor* PRESTWOOD;

*Part-time Instructor* ZANKER.

### 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:* Education 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:* Education 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 Education 3201 and/or 3308 and/or 3403 and/or 3420.)

### For Undergraduates and Graduates

*Prerequisite* for courses listed below: Twelve semester hours of Education

- 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.
- 3403 Introduction to Guidance for Elementary 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.
- 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.
- 3435 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 measurements.

**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:* Education 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 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 hours of Graduate work (3500 level.)
- 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:* Education P. 3400 or 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.

*School of Education*

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**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:* Educational Psychology 3500, 3502, 3435, 3520, 3539, 3519 or 3538.

**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. *Prerequisite:* Twelve hours of 3500 level courses in Counseling.

**3520 Socio-Economic Information in Guidance — Seminar (3-0)**

Educational, occupational, and social information and its use in counseling and guidance. *Prerequisite:* Educational Psychology 3435, 3502, 3504, 3539.

**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 Education of The University of Texas at El Paso. *Prerequisite:* Only by permission of the department head.

**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:* Education 3435 and 3500.

**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. *Prerequisite:* 3435, 3504, 3502, 3519.

**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. *Prerequisite:* 3201 and Graduate Standing.

**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 Education, and permission of the head of the department.

**Requirements for the programs in Counseling:**

Education 3435, 3502, 3504, 3518, 3519, 3520, 3522, 3539, plus six hours of graduate courses in Education (Education 3420 must be taken if not completed as part of the undergraduate program).

## HEALTH &amp; PHYSICAL EDUCATION

BEN W. COLLINS, *Head**Associate Professors* COLLINS, HARDIN, HARRIS, McCARTY;*Assistant Professors* CRAIGO, CLARDON, B. KELLY, N. KELLY,\* LOPER, POTEET;*Instructor* MOORE.

## HEALTH EDUCATION

**For Undergraduates***General prerequisite:* Junior standing for all 3300 or 3400 level courses.**3301 Health Science Information (3-0)**

Open to all students. Required of all physical education majors. 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.

**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 Head of the department.

**3302 Elementary School Health Education (3-0)**

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

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

The scope of Health Education in the Elementary 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 Head 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:* HE 3101. Senior standing.

## PHYSICAL EDUCATION

**For Undergraduates****1101 Service Course for Men (\$2) (0-3)**

May be repeated for credit.

**1102 Service Course for Women (\$2) (0-3)**

May be repeated for credit.

\*Visiting.

*School of Education*

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**Skill Courses for Majors (0-3)**

<i>Women</i>		<i>Men</i>	
1122	1204	1121	1203
1124	1302	1123	1301
1202	1304	1201	1303

- 3103 Introduction to the Public Schools and to Physical Education (3-0)**  
The purposes, objectives, and methods of operation of the public school are described. The student is provided an overview of health, physical education, and recreation.
- 3203 Curriculum Construction (3-0)**  
A study of the principles of curriculum construction, the philosophy of physical education content, progression, and organization of the physical education program for all levels of the educational program. A curriculum to meet a specific situation will be outlined. *Prerequisite:* Six semester hours of Health and Physical Education or permission of the Head of the department.
- 3205 Methods and Materials for Elementary Schools (3-0)**  
Consideration is given to the methods and materials of instruction, the content, progression, organization and philosophy of the physical education program including rhythms for the Elementary and Junior High levels. *Prerequisite:* Three semester hours of Health and Physical Education or permission of the Head of the Department.
- 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. Fall term. *Prerequisite:* Sophomore standing.
- 3207 Techniques of Coaching Track and Field and Baseball (3-0)**  
Spring term. *Prerequisite:* Sophomore standing.
- 3215 Historical and Cultural Aspects of Dance (3-0)**  
A cultural survey of the emergence of dance on the American scene in the 20th century, with consideration of dance as an expressive art in education.

**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 Head of the Department.
- 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:* PE 3304.
- 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 4202, 4203 and twelve semester hours of Physical Education.

- 3316 Techniques, Methods and Materials of Instruction in Rhythms for High School Grades (3-0)**  
A class in rhythmical materials in social, country, folk, tap and modern dance. *Prerequisite:* Twelve semester hours of Physical Education or permission of the Head of the department.
- 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 psychologicola 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 Head 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:* Twelve semester hours of Physical Education, Biology 4203. Senior standing.
- 3410 Undergraduate Seminar (3-0)**  
Directed study in selected areas of Physical Education. This may be substituted for a deficiency in the required advanced Physical Education course in the Physical Education major. *Prerequisite:* Twelve semester hours of Physical Education or permission of the Head of the Department. May be repeated for credit.
- 3413 Growth and Development of the School Child (3-0)**  
The correlation between growth and developmental changes and the chronological ages of the school child with emphasis on gross motor development. A study of the physiological changes that are characteristic of the various age levels of the school child and their relationship to the child's emotional, social, and mental development. *Prerequisite:* Twelve semester hours of Physical Education or permission of the Head of the department.
- 3414 Developmental Programs in Physical Education (3-0)**  
Programs to meet the needs of those individuals who are sub-par in physical fitness and skills. Emphasis on children with physical handicaps. *Prerequisite:* Twelve semester hours of Physical Education. 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; Education 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; Education 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; Education 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 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 T.E.A. Health Education curriculum will be studied at all public school levels.
- 3506 Scientific Basis of Physical Education**  
Designed to approach at an advanced level the kinesiological, mechanical, physiological and psychological aspects of physical education. *Prerequisite:* Physical Education 3312 or equivalent.
- 3507 Program Planning and Administration of Physical Education**  
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:* Physical Education 3311 or Education 3535.
- 3509 Independent Study in Health and Physical Education**  
This course will emphasize individual problems in the field of health and physical education. The course may be repeated one time 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.
- 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:* Physical Education 3303, Education C3312 or equivalent.
- 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.
- 3550 Workshop in Problems in Health and Physical Education**
- 3551 Advanced Workshop in Problems in Health and Physical Education**





# School of Engineering

DONALD P. KEDZIE, *Acting Dean*



# SCHOOL OF ENGINEERING

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## CIVIL ENGINEERING

CALVIN E. WOODS, *Head*

*Professors* HASSLER, HENDERSON, WOODS;  
*Associate Professors* COLTHARP, ROZENDAL, YOUNG;  
*Assistant Professors* OEY, McDONALD, TARQUIN;  
*Lecturers* BARBAREE, DECKER, JETTON, JONES, KIRBY,  
NUSYNOWITZ, RIEMANN, VANDERTULIP.

(See page 47 for Degree Plan)

### For Undergraduates

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

- 3101 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.
- 3103 Scientific and Engineering Analysis (2-2)**  
An introduction to analysis; includes presentation of data, curve plotting, nomographs, mathematical tools, unit systems and dimensional analysis of experimental data.
- 3115 Engineering Mechanics I (3-0)**  
Forces in space, equilibrium of particles and rigid bodies, friction, centroids, centers of gravity, and kinetics and kinematics of particles. *Prerequisite:* Mathematics 4212 concurrently.
- 3170 Honors Seminar (3-0)**  
Selected topics in Engineering or individual research for qualified freshman students. *Prerequisite:* Permission of Instructor.
- 3202 Engineering Problem Analysis (2-3)**  
Studies to include the techniques and tools of problem analysis. *Prerequisite:* Mathematics 4111 and 4212.
- 3204 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.
- 3213 Engineering Measurements (2-3)**  
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.
- 3214 Field Surveying (7-0)**  
Summer work: Practical application of the topics covered in CE 3213. *Prerequisite:* CE 3213.
- 3234 Mechanics of Materials I (3-0)**  
Study of stress, strain, torsion, shear, moment, flexure, combined stress at a point and column action. *Prerequisite:* Civil Engineering 3115.
- 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 rigid bodies. *Prerequisite:* CE 3115.

- 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 or approval of instructor.
- 4343 Structural Analysis I (3-3)**  
A study of framed structures, trusses, girders and bridges. Analysis of statically indeterminate structures including beams and frames. *Prerequisite:* CE 3234.
- 3435 Structural Design I (3-0)**  
Reinforced concrete theory; design of beams, columns, slabs, footings and retaining walls using current design specifications. *Prerequisite:* CE 4343.
- 3440 Transportation Engineering (3-0)**  
Study of planning, economics, finance, location, design and administration of transportation systems. *Prerequisite:* CE 3214 and 4448 or concurrent enrollment.
- 4441 Water Treatment and Analysis (3-3)**  
Principles of water treatment and its application to the design and operation of municipal and industrial water treatment plants. Laboratory analysis of water. *Prerequisite:* Chemistry 4203-04, and ME 4354.
- 4442 Waste Treatment and Analysis (\$2) (3-3)**  
Principles of waste treatment and disposal and its application to the design and operation of waste treatment plants. Laboratory analysis of wastes. *Prerequisite:* CE 4441.
- 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.
- 4448 Soil Mechanics (\$2) (3-3)**  
Physical and mechanical properties of soils; specific gravity, grain size distribution, plasticity, shrinkage, permeability, compressibility, consolidation and shear. *Prerequisite:* Civil Engineering 3234, Mechanical Engineering 3354, 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 448.
- 3456 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.
- 4460 Structural Analysis II (3-3)**  
Analysis of statically indeterminate structures including continuous beams and frames. *Prerequisite:* Civil Engineering 3234 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 4343.
- 4456 Hydraulic Engineering (\$2) (3-3)**  
Principles of hydrology and hydraulics applied to the design of hydraulic projects. *Prerequisite:* Mechanical Engineering 3354.
- 4470 Mechanics of Materials II (\$6) (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.

**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 3354 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.

**3503 Analysis and Design of Water Resources Projects (3-0)**

The analysis and design of a complete hydraulic project or structure. Possible projects are multipurpose river storage projects, spillways, water power developments, pipelines, pumping stations, distribution and collection systems, flood control systems, ocean cutfalls, irrigation systems, water and sewage treatment plants, navigation locks, and harbors. May be repeated for credit. *Prerequisite:* Approval of instructor.

**3504 Construction Engineering (3-0)**

Study of construction estimating, planning, methods and procedure. Application and maintenance of construction equipment and machinery. *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; interpretations of the static and dynamic response of soils and other deformable media. May be repeated for credit. *Prerequisite:* Civil Engineering 4343 or approval of instructor.

**3506 Soil Mechanics II (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 of Soils (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.

**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.

- 3510 Water Resources and Irrigation (3-0)**  
Problems in water resources conservation and utilization. Water supply development and irrigation principles applied to the design of pumping plants, water conveyance and distribution systems. *Prerequisite:* Civil Engineering 4356 or approval of instructor.
- 3511 Municipal Design and Planning (3-0)**  
Orderly development and extension in city growth, civil, legal and engineering aspects; subdivisions, zoning, park systems, water fronts, street systems, airports and transportation terminals and traffic controls; the functional organization of a city and city engineering organization. *Prerequisite:* Approval of instructor.
- 3512 Plastic Design of Steel 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.
- 3513 Prestressed Concrete Design (3-0)**  
The study of prestressing methods and their application to the design of concrete structures. *Prerequisite:* Civil Engineering 3435 or approval of instructor.
- 4514 Mobile-Bed Fluviology (3-3)**  
Mechanics of fluid flow, bed-load transport, and suspended load in rivers. Evolution of river beds and sedimentation. Practical solutions to problems of erosion and training works. *Prerequisite:* Mechanical Engineering 3354 or approval of instructor.
- 4515 Hydraulic and Sanitary Structures (3-3)**  
Design of concrete and steel hydraulic and sanitary structures. *Prerequisite:* Civil Engineering 3234 or approval of instructor.
- 4516 Radiological Health Engineering (3-3)**  
Principles of radiological health. Analysis of radiation hazards; ionizing effects of radiation; unit operations and processes used in handling radioactive wastes; dosimetry, principles of detection devices; decontamination. *Prerequisite:* Approval of instructor.
- 3517 Similitude in Research (3-0)**  
Theory of similitude and its use in planning, conducting and analyzing physical experiments in engineering and biological sciences. *Prerequisite:* Approval of instructor.
- 4518 Advanced Soil Mechanics I (3-3)**  
Seepage through dams and foundation soils. Properties of line seepage. Seepage pressures: Piping and boiling as applied to stability of dams and levees and sheeted excavations. Ground water lowering for construction purposes. Sub-drainage of air fields. *Prerequisite:* CE 4448 or consent of the instructor.
- 4519 Foundation Engineering II (3-3)**  
Dams on rock and sediments. Effects of geological variations on stability and integrity of structures. Stability of slopes in natural ground. Earthquake resistant structures. Tunnels in hard and soft ground. *Prerequisite:* CE 4448 or consent of the instructor.
- 3520 Advanced Soil Mechanics II (3-0)**  
Theoretical Soil Mechanics. Fundamental structure and properties in soils. Formation of soils, clay mineralogy, and soil structure. Theory of consolidation and compaction. *Prerequisite:* CE 4448 or consent of the instructor.
- 3521 Air Resources (3-0)**  
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.

*School of Engineering*

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**3522 Water Resources (3-0)**

Water Quality Improvement. Principles of treatment of domestic and industrial wastewaters; stream and estuarial self-purification. *Prerequisite:* Consent of the instructor.

**3523 Water Resources — Hydrometeorology (3-0)**

Study of precipitation mechanisms; climatic trends and cycles; man's influence on the hydrologic cycle; evaporation and vapor transposition; and engineering applications.

**3525 Bioengineering Processes II (3-0)**

A study of the biochemical processes that occur due to microbial activity in the ecosystems present in all of domestic, agricultural and industrial pollution.

**3526 Environmental Health Engineering I (3-0)**

A study of the diseases causing microorganisms that can occur in polluted areas and the role of pollution in the spread of certain diseases.

**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:* Permission of the instructor.

**3598-99 Thesis Course for the Master's Degree**

## ELECTRICAL ENGINEERING

J. O. KOPPLIN, *Head*

*Professors* KOPPLIN, LAMBERT, NICHOLS; *Adjunct Professor* HOLT; *Associate Professors* AUSTIN, GIBSON, SMITH; *Assistant Professors* MAXWELL\*, McDONALD, PIERLUSSI; *Instructors* COMAS, MARTINEZ.

(See page 48 for Degree Plan)

## For Undergraduates

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

- 2310 Electrical Engineering Laboratory I (\$4) (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 4251.
- 4251 Networks I (\$2) (3-3)**  
Theory and analysis of networks including the basic laws, complex phasor algebra and impedance, sinusoidal single-phase circuits, resonance, and network equations and theorems. *Prerequisite:* Mathematics 3217.
- 4277 Basic Electrical Engineering (\$2) (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 (\$2) (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.
- 4321 Electromagnetic Field Theory (3-2)**  
Fundamentals of static electric and magnetic fields, time-varying fields and Maxwell's equations, motion of charged particles in electromagnetic fields.
- 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 4251 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.
- 4352 Networks II (\$2) (3-3)**  
Continuation of Networks I. Balanced and unbalanced polyphase circuits, coupled circuits and transformers, Fourier analysis, transient response and the complex frequency plane, and the Laplace transformation. *Prerequisite:* Electrical Engineering 4251.

\*On leave of absence.

**For Undergraduates and Graduates**

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

- 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.
- 4447 Electromagnetic Energy Transmission and Radiation (\$2) (3-3)**  
Derivation and applications of the general transmission-line equations, propagation and reflection of plane waves, analysis of wave guide transmission systems, electromagnetic radiation and simple antenna systems. The laboratory experiments utilize the principles set forth in Electrical Engineering 3441 and 4447. *Prerequisite:* Electrical Engineering 4321 and 3340 and 3441 concurrently.
- 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 4352.
- 3465 Modeling and Simulation (\$2) (2-3)**  
Theory and application of analog, computers, application of control theory to hydraulic, electrical, and electromechanical systems, analog and digital computer simulation, student project. *Prerequisite:* EE 3464 or concurrently.
- 3469 Switching Circuits (3-0)**  
Study of logical properties of circuits based on two-valued devices used in digital computers and control and telephone switching; elements of logical algebras including the propositional calculus and Boolean algebra; logical analysis and synthesis of combinational nets; optimization of series-parallel controlled-contact circuits; and sequential relay circuits. *Prerequisite:* Senior standing in engineering or permission of the instructor.
- 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. May be repeated for credit.
- 3472 Digital Computers (3-0)**  
An introduction to digital computers including arithmetic procedures, basic programming patterns, input-output systems, storage systems, arithmetic units, methods of control, and basic timing and control sequences; comparative analysis of representative digital computing machines and their associated engineering, arithmetic, and logical design characteristics. *Prerequisite:* Electrical Engineering 3469 or permission of the instructor.
- 3474 Analog Computers (\$2) (2-3)**  
Operation of analog computers, solution of linear and nonlinear ordinary differential equations using analog computers, various applications of analog computers. Not intended for Electrical Engineering majors. *Prerequisite:* Mathematics 3326 or permission of 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 4447 or equivalent.



- 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.
- 4485 Energy Conversion (4-0)**  
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 4352.
- 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 4485 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 4447 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 4447 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.
- 3508 Sampled-Data and Digital Control Systems (3-0)**  
Theoretical analysis and optimization of sampled-data control systems; application of digital-computing devices in closed loop systems. *Prerequisite:* Electrical Engineering 3507.
- 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.

*School of Engineering*

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- 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.
- 4513 Principles of Pulse Circuits (\$2) (3-3)**  
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 Field Theory (3-0)**  
The inhomogeneous wave equation; relativistic kinematics and the Lorenz transformation; covariance and relativistic mechanics; covariant formulation of electrodynamics; the Lienard-Wiechert potentials; Hamiltonian formulation of Maxwell's equations. *Prerequisite:* Electrical Engineering 4447 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)**  
Probability theory, Lebesgue integration, representation of random variables and processes, time and frequency domain analysis of random processes. *Prerequisite:* Electrical Engineering 3441 or consent of the instructor.
- 3524 Statistical Communication Theory (3-0)**  
Optimum filters, signal detection problems, Gaussian Random processes, statistical estimation, measurement problems, modulation by random processes. *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 4352.

**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.

**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**

## MECHANICAL ENGINEERING

JOHN M. LEVOSKY, *Head*

*Professors* COLEMAN, EDWARDS:

*Associate Professors* BHADURI, CERVENKA, DOWDY, LEVOSKY, WHITACRE

*Assistant Professor* BACON.

(See pages 49 & 50 for Degree Plans)

### For Undergraduates

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

- 3103 Graphical Fundamentals in Engineering Design (\$2) (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) (2-3)**  
Role of the engineer; engineering problems solutions; engineering design methods; elementary digital computer programming; design project. *Prerequisite:* ME 3103 or concurrently.
- 3201 Engineering Communications (3-0)**  
Preparation and presentation of written and oral reports related to engineering. *Prerequisite:* English 3101-02, with a grade of "C" in each course, and enrollment in engineering, or permission.
- 3205 Basic Measurements and Instrumentation (\$2) (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 3326 or concurrently.
- 3236 Manufacturing Processes and Quality Control (\$2) (2-3)**  
Theory and practice of production as a system; power, material, choice of process. Introduction to engineering probability; quality control. *Prerequisite:* Ma 4217 or concurrently.
- 3275 Thermodynamics I (3-0)** [Formerly 3375]  
Principles of thermodynamics of single and multi-phase systems of pure substances. *Prerequisite:* Ma 4212.
- 4351 Heat Transfer (\$2) (3-3)** [Formerly 3351]  
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 (\$2) (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:* Ma 3326 or concurrently.
- 4363 Kinematics and Dynamics of Mechanisms (\$2) (3-3)**  
Analysis of displacement, velocity and acceleration in basic mechanisms for control, transmission and conversion of motion and force. Forces associated with accelerated motion. *Prerequisite:* CE 3238.
- 4365 Dynamic Response (\$2) (3-3)** [Formerly 3465]  
Fundamentals of vibration theory and system response. Simple and multiple degrees of freedom, critical speeds, damping, isolation. *Prerequisite:* Ma 3326.
- 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.

**4377 Work Measurement (\$2) (3-3)**

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.

**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 Design of Machine Members (\$2) (2-3)**

[Formerly 3364]

Application of mechanics, kinematics and materials science to the design and selection of machine members, fastenings, pressure vessels. Lubrication theory; stress concentration and residual stresses. *Prerequisite:* ME 4363.

**4466 Machine Design (\$2) (2-6)**

Continuation of the design sequence. Feasibility studies and preliminary design of mechanical systems, including detailed design of one or more machines in a system. *Prerequisite:* Senior standing in engineering, or permission.

**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.

**3483 Tool Engineering (3-0)**

Design of tools, jigs, and fixtures for quantity production. *Prerequisite:* Senior standing in engineering or permission of instructor.

**3484 Industrial Layout (\$2) (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 (\$2) (2-3)**

The statistical design of systems for prescribed quality levels and prevention of defects. *Prerequisite:* Ma 3331 or EE 3484 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)**

Structural analysis as applied to aircraft. Analysis of thin skin structures; unsymmetrical bending, shear center, shear flow. *Prerequisite:* Civil Engineering 3234.

**FOR GRADUATE STUDENTS ONLY**

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

- 3501 Experimental Stress Analysis (\$2) (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)**  
Box-beam theory; shear flow, shear center, strength and deflections. Unsymmetrical beam loading. Statically indeterminate structures. Beams on elastic foundation. *Prerequisite:* Civil Engineering 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 (\$2) (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.

- 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, *Head*

*Professors* ABERNETHY, KEDZIE, RINTELEN, THOMAS (Emeritus);

*Associate Professors* EHRLINGER, RIZZO, ROSER.

*Instructor* J. H. FORD.

(See pages 51-53 for Degree Plans)

### For Undergraduates

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

- 3101 Introduction to Metallurgy I (\$2) (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) (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.
- 3103 Introduction to Materials (\$3) (2-3)**  
A non-mathematical conceptual introduction to the understanding of modern ceramic, glass, metallic, and polymeric materials. Open to all students.
- 3201 Principles of Process Metallurgy (2-1)**  
A study of the fundamental engineering principles applied to metallurgical processes. Field trips are made to metallurgical industries. *Prerequisite:* Chemistry 4103-04.
- 4203 Materials Science (\$3) (3-3)**  
A solid state study concerned with the physical and mechanical properties of metals, plastics, and ceramics. Three lectures and three laboratory hours per week. *Prerequisite:* Chemistry 4103-04.
- 4302 Mineral Dressing I (\$2) (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:* One semester of physics, or Metallurgy 3102.
- 3301 Metal Economics (3-0)**  
An advanced study of metals and products, cost and production control, and exploration and research programs. *Prerequisite:* 6 semester hours of Metallurgical Engineering courses.
- 3309 Physics of Materials (3-0)**  
A study of solid state physics applied to metals and alloys. *Prerequisite:* Metallurgy 4203 or Math 3212 and Physics 4216 or E.E. 4321 concurrently for E.E. students.
- 3315 Non-Ferrous Process Metallurgy (3-0)**  
The smelting and refining of non-ferrous metals. One third of the course is devoted to calculations pertaining to the above subjects. *Prerequisite:* Chemistry 4103-04, one semester of physics, and Math 4110 or Metallurgy 3201, or permission of instructor.



## For Undergraduates and Graduates

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

- 4403 Mineral Dressing II (\$2) (3-3)**  
Advanced principles of ore dressing, ore testing, flowsheets, and mill design. *Prerequisite:* Metallurgy 4302.
- 3402 Ferrous Process Metallurgy (3-0)**  
A course in the metallurgy and fabrication of iron, steel and related alloys. One-third of the course is devoted to calculations pertaining to the subject. *Prerequisite:* Metallurgy 3201 and 4203.
- 3404 Electro-Metallurgy (\$3) (2-3)**  
The fundamental principles of electro-winning and the electro-plating of non-ferrous metals. *Prerequisite:* Metallurgy 3201, or Chemistry 4103-04 and Physics 4216, or permission of instructor.
- 3471 Engineering Problems — Seminar**  
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.
- 3406 Chemical Engineering Thermodynamics (3-0)**  
A study of the Laws of Thermodynamics, Power Generation, Properties of Fluids, Solution Theory and Chemical Equilibria. *Prerequisite:* Senior standing in Engineering or permission of instructor.
- 3409 Corrosion (3-0)**  
A study of corrosion, passivity, and protection of metals and alloys. *Prerequisite:* Metallurgy 3404 or permission of the Head of the Metallurgical Engineering Department.
- 3410 Chemical Reactor Design (3-0)**  
The Application of Thermodynamics, Transport Phenomena and Chemical Kinetics to the Design of Industrial Chemical Reactors. *Prerequisite:* Senior standing in Engineering or permission of instructor.
- 3413 Thermodynamics of Metals (3-0)**  
The thermodynamics of metals and metallurgical process. *Prerequisite:* Metallurgy 4203 and Chemistry 4360 or 4361.
- 4407 Physical Metallurgy I (\$3) (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 4203.
- 4408 Transport Phenomena (4-0)**  
A study concerning Principles of Mass, Momentum and Energy Transport; Determination of Transfer Coefficients; and Application to Industrial Situations. *Prerequisite:* Senior standing in Engineering or permission of instructor.
- 4409 Chemical Kinetics (4-0)**  
An Introduction to Principles of Chemical Kinetics, Study of Catalysis, and Kinetics in the Chemical Industry. *Prerequisite:* Senior standing in Engineering or permission of instructor.
- 4411 Physical Metallurgy II (\$3) (3-3)**  
A theoretical study of methods of measuring and controlling variables pertaining to metallurgy; microscopy applying transmitted and reflected polarized light to the study of ores, slags, and metals; and spectroscopy. *Prerequisite:* Metallurgy 4203 or 3309.

- 4412 Physical Metallurgy III (\$3) (3-3)**  
Introduction to X-ray diffraction, the study of metallic structure, alloy constitution, deformation processes and solid phase reactions. *Prerequisite:* Metallurgy 4411 or 3309.
- 4413 Non-Destructive Testing (3-3)**  
A study of non-destructive testing of material. The application of radiography, magnaflux, reflectoscope and the use of dye penetrants. *Prerequisite:* Senior standing in Engineering or permission of the instructor.
- 4415 Mechanical Metallurgy (\$3) (3-3)**  
A study of plastic deformation of metals, dislocation theory, mechanical testing, and the fundamentals of metalmaking. *Prerequisite:* Metallurgy 4203.

#### FOR GRADUATE STUDENTS ONLY

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

- 4501 Advanced X-Ray Diffraction (\$6) (3-3)**  
A continuation of Metallurgy 4412. Studies of structure are expanded with the aid of advanced instrumentation. *Prerequisite:* Metallurgy 4412 or its equivalent as approved by the instructor.
- 3502 Theory of Welding and Joining (\$6) (3-0)**  
A study of joining of materials and the resulting metallographic structures. *Prerequisite:* Metallurgy 4407 or its equivalent as approved by the instructor.
- 4502 Fatigue of Engineering Materials (\$6) (3-3)**  
Influence of repeated stress in engineering design, fatigue testing machines and procedures, factors influencing fatigue properties and the theories of fatigue failure. *Prerequisite:* Permission of the instructor.
- 3503 Corrosion (3-0)**  
A study of electrochemistry, polarization theory, mechanism of passivity, inhibitors and surface phenomenon, cathodic protection mechanism and applications, stress corrosion cracking and hydrogen embrittlement and prevention of corrosion. *Prerequisite:* Metallurgy 3409 or its equivalent as approved by the instructor.
- 3504 Theory of Dislocations (3-0)**  
The theory of dislocations applied to the structure and properties of metals. *Prerequisite:* Metallurgy 4415 or its equivalent as approved by the instructor.
- 3505 Advanced Mechanical Metallurgy (3-0)**  
A continuation course of Metallurgy 4415. A solid-state approach of mechanical metallurgy is studied. *Prerequisite:* Metallurgy 4415 or its equivalent as approved by the instructor.
- 3506 Materials Science (3-0)**  
Subjects covering advanced theories of bonding, electronic, atomic, and structural contributions to engineering properties, correlation of data, bonding, selection and fabrication of actual (a) polymeric materials, (b) ceramic materials, (c) metallic materials. *Prerequisite:* Metallurgy 3309 or its equivalent as approved by the instructor.
- 4506 Electron Microscopy (\$6) (3-3)**  
A study of the theory and application of electron microscopy. The preparation of specimens for transmission and replica procedures. *Prerequisite:* Permission of the instructor.
- 4507 Powder Metallurgy (\$6) (3-3)**  
Basic principles of metal powder compacting and sintering are studied relative to solid-state 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.
- 3509 Kinetics of Solid State Reactions I (3-0)**  
 A review of basic kinetic theory. A study of diffusion in solids, nucleation theory, growth theory followed by application of these principles to diffusional phase transformations, non-diffusional or Martensitic transformations and oxidation. *Prerequisite:* Metallurgy 3413 or its equivalent as approved by the instructor.
- 4509 Advanced Metallography (\$6) (3-3)**  
 A metallurgical and metallographic study of recently developed alloys. *Prerequisite:* Metallurgy 4407 or its equivalent as approved by the instructor.
- 3510 Advanced Thermodynamics of Solids (3-0)**  
 Metallurgical thermodynamics applied to chemical metallurgy, constitution diagrams, heterogeneous equilibrium and rates of reaction. *Prerequisite:* Metallurgy 3413 or its equivalent as approved by the instructor.
- 3511 Kinetics of Solid State Reactions II (3-0)**  
 A continuation of Metallurgy 3509.
- 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.
- 4512-13 Engineering Ceramics I & II (\$6) (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.
- 3598-99 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. CARNSEY, *Head*

*Professors* CARNSEY, MASSEY, HARRISON; *Associate Professor* DEPAGTER;  
*Assistant Professors* ARNOLD, COOGLER; *Instructors* BISHOP, JANZEN.

**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 67) — 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.

### 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 *Advanced Drawing I*
- 3308 *Advanced 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.

### 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.

#### 3103 *Design II (2-4)*

Continuation of Art 3101. *Prerequisite:* Art 3101.

#### 3102 *Drawing I (2-4)*

Introduction to various types and uses of drawing in a variety of media and subject matter.

#### 3104 *Drawing II (2-4)*

Continuation of Art 3102. *Prerequisite:* Art 3102.

### 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.

- 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\* (\$4) (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 (\$4) (2-4)**  
Continuation of Art 3201. *Prerequisite:* Art 3201.
- 3208 Advanced Drawing I\* (\$8) (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 Advanced Drawing II (\$8) (2-4)**  
Continuation of Art 3208. *Prerequisite:* Art 3208.
- 3202 Sculpture I\* (\$8) (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 (\$8) (2-4)**  
Continuation of Art 3202. *Prerequisite:* Art 3202.
- 3203 Metals I\* (\$8) (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 (\$8) (2-4)**  
Continuation of Art 3203. *Prerequisite:* Art 3203.
- 3215 Enamels I\* (\$8) (2-4)**  
Basic techniques in enameling from jewelry forms to the enameling of hollow ware. *Prerequisite:* Art 3103, and Art 3104.
- 3315 Enamels II (\$8) (2-4)**  
Continuation of Art 3215. *Prerequisite:* Art 3215.
- 3204 Ceramics I\* (\$8) (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 origins and composition, decorating processes, firing kilns and nontechnical glaze composition. *Prerequisite:* Art 3103, and Art 3104.

\*Prerequisite as indicated or equivalent as determined by Department Head

*School of Liberal Arts*

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- 3304 Ceramics II (\$8) (2-4)**  
A continuation of Art 3204. *Prerequisite:* Art 3204.
- 3305 Printmaking I\* (\$4) (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 (\$4) (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 (\$4) (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. 3301.
- 3312 Methodology and Theory for Secondary School Art Education Specialists (\$4) (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 (\$4) (2-4)**  
A survey of materials, methodology and research related to the teaching of Elementary School Art Education. *Prerequisite:* Art 3311 and Art 3312.
- 3322 Advanced Practicum and Theory of American Public Secondary School Art Education (\$4) (2-4)**  
An intensive survey of the Sociological, Psychological, Philosophical and Historical foundations of American public school Art Education. *Prerequisite:* Art 3312 and Art 3321.
- 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 (\$10 fee for each course)**  
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 (\$10), Painting (\$10), Metals (\$10), Sculpture (\$10), Printmaking (\$10), Advanced Drawing (\$10)]**

\*Prerequisite as indicated or equivalent as determined by Department Head



## B I B L E

*Instructors* ALLEN, BURKE, SMITH, and SWIFT. *Teaching Assistant* RUCKMAN.

Credit toward University degrees is given for certain courses offered under the following regulations established by the Board of Regents to maintain the equivalence of these courses with other courses given in the University:

The plant in which the courses credited are given must (1) be located in El Paso, convenient to the University; (2) contain adequate classroom facilities — rooms, seats, blackboards, charts, maps, tables; (3) provide a library of books, dictionaries, and lexicons costing at least \$500 as an initial expenditure.

The instructors by whom the courses credited are given must (1) be under the control of some permanent religious organization of recognized standing; (2) possess at least the training demanded of instructors in the University; (3) devote their time primarily to teaching; (4) be approved by the President, subject to final action by the Board of Regents.

The courses credited must (1) be in the field of historical or literary, but not exegetical or doctrinal, study of the Bible; (2) be thoroughly organized, with syllabi showing the outlines and required readings; (3) be of University grade and on a subject suitable for University instruction; (4) be given in regular classes with meetings at least equal in number, in length of period, and in amount of preparation required, to those of a University course involving the credit asked; (5) include regular tests or examinations corresponding to those of the University, to be given at the time prescribed by the University for other examinations; (6) be subject to the same regulations and oversight as regular courses in the University.

The students enrolled in the courses for credit (1) may be credited with no more than twelve semester hours in Bible on any bachelor's degree; (2) are subject to the regulations of the catalog on the amount of work which may be carried.

Bible courses for which college credit is given are conducted by the Baptist Student Union, the Wesley Foundation and Church of Christ Bible Chair.

#### For Undergraduate Credit Only

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

**1102 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.

**3103 The Life of Christ (3-0)**

A historical study of the life and teachings of Christ. *Prerequisite:* Bible 3104 or Junior standing.

**3104 Survey of the New Testament (3-0)**

A comprehensive study of the entire New Testament.

**3201 The Life of Paul (3-0)**

A historical study of the life and missionary endeavors of the Apostle Paul. *Prerequisite:* Bible 3104 or Junior 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:* Bible 3101 or 3104 or Junior standing.
- 3210 African Religions (3-0)**  
Attention will be given to the development of religion in Africa from prehistory to the present. *Prerequisite:* Sophomore standing.
- 3301 Comparative Religion (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:* Junior standing or Bible 3101 or 3104 or 3210.
- 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.
- 1202 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:* Bible 3101.
- 2202 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:* Bible 3101 or Junior standing.

DRAMA & SPEECH

RALPH B. CULP, *Head*

*Professors* CULP, HARDING, LEECH, WILLIAMS, WINGATE; *Associate Professor* ADKINS; *Assistant Professors* ETHERIDGE, GOURD, JONES, LANIGAN, MICULKA, RONKE, TUCKER, WOOD; *Instructors* BRAND, BYRNE, RESLER, WALLIS.

FOR UNDERGRADUATES

**B.A. Degree:** Majors in Drama and/or Speech must take the following courses:

- (1) **Speech 3101: Public Speaking;**
- (2) **Drama 3113: Introduction to Theatre**
- (3) **Drama/Speech 3103: Voice and Articulation**  
or **Speech 3110: Phonetics;**
- (4) **Speech 3220: Introduction to Rhetoric and Public Address**

In addition, majors must take eighteen advanced hours (3300, 3400 level) in *one* of the following areas of specialization:

- (1) **Drama**
- (2) **General Speech**
- (3) **Rhetoric and Public Address**

Drama majors must take *four* semesters of Drama 1111: Basic Theatre Practice. Speech majors must take four semester of Speech 1101: Choral Reading.

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

**PLAN I:** Speech 3101, 3110, 3315; English 3220; Psychology 3101, 3201; Education 3306 or Psychology 3409; Pathology 3210, 3312, 3313, 3314, 3409, 3410, 3441, 3442, plus nine additional advanced hours (3300 or 3400) in Speech.

**PLAN II:** Speech 3101, 3110 3315; English 3220; Pathology 3210, 3312, 3314, 3409, 3410, 3441, 3442; Education 3301, 3302, 3409, plus twelve additional advanced hours (3300 or 3400) in Education, including six hours of supervised professional laboratory experience in speech and hearing therapy in the public schools.

**PLAN III:** Speech 3101, 3110, 3315; English 3220; Psychology 3101, 3201; Education 3409 or Psychology 3306; Pathology 3210, 3312, 3313, 3314, 3409, 3441, 3442.

In addition to course requirements, 175 hours of clinical practice supervised by a faculty member with the ASHA Certificate of Clinical Competence, or 200 hours if state certification is sought.

*Majors in Drama, Speech, or Speech Pathology must pass an examination in the major subject. At the discretion of the department head, part of the examination in drama or speech may be a performance before an audience; part of the examination in speech pathology may be in clinical practice.*

FOR UNDERGRADUATES AND GRADUATES

*General Prerequisite:* Junior standing (60 semester hours)  
for all 3300 or 3400 level courses.

DRAMA

**1103 Speech Laboratory (0-4)**

The laboratory for Drama/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.

*School of Liberal Arts*

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**1111 Basic Theatre Practice (0-4)**

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

**3103 Voice and Articulation (3-4)**

A course designed to improve the student's speech, to study phonetic concepts and the phonetic alphabet, and to examine major dialects of English, including stage speech. The laboratory will be Drama/Speech 1103. Not open for credit to students who are enrolled in or have received credit for Speech 3103.

**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.

**3205 Oral Interpretation (3-2)**

Study and practice of the techniques of oral interpretation of literature. The laboratory will be Speech 1101: Choral Reading. Not open to students who are enrolled in or received credit for Speech 3205.

**3213 Acting I (3-4)**

A lecture-laboratory course in which a student may develop his ability to analyze a character and create a role. Offered first semester.

**3214 Acting II (3-4)**

Detailed study of characterization and styles of acting through assignment of individual roles and group rehearsal of scenes. *Prerequisite:* Drama 3213. Offered second semester.

**3215 Summer Theatre Workshop (3-4)**

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.

**3221 Stagecraft (3-4)**

Introduction to and practice in stage methodology. Includes basic instruction in stage design and structure. 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. Not open to freshmen. Not open to students who are taking or have received credit for Speech 3290. Offered first semester.

**3325 Directing I (3-4)**

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. Required of all-levels education majors who intend to teach on the secondary level. Offered during first semester.

**3326 Directing II (3-4)**

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 3325. Offered second semester.

**3332 Scene Design (3-4)**

Detailed study of the technical problems of theatre production. Methods of designing, constructing, and handling scenery, lighting, backstage organization, properties, and sound effects. Offered first semester of alternate years, beginning in 1970-71.

- 3340 A History of Costume (3-4)**  
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. Offered during first semester of alternate years only, beginning in 1971-72.
- 3342 Lighting (3-4)**  
A history of lighting and an analysis of contemporary lighting techniques. Practice in designing and executing the lighting for major productions. Offered first semester of alternate years, beginning in 1971-72.
- 3351 Theatre Arts for the Elementary School Teacher (3-4)**  
Methods of recognizing and developing the creativity of elementary school children through the techniques of drama and theatre. Emphasizes understanding the needs of children, techniques of motivation, and development of impersonation, improvisation, playmaking, and other devices as tools of learning. Participation in theatre for the elementary school child. Not open to students who are enrolled in or have received credit for Speech 3351. Offered first semester.
- 3352 Theatre Arts for the Secondary School Teacher (3-4)**  
Problems and projects in the use of theatre arts to develop the secondary school student and to teach specific subject matter. Participation in theatre for the secondary school student. Not open to students who are enrolled in or have received credit for Speech 3352. Offered second semester.
- 3357 The Early Theatre (3-0)**  
Study of theatre art from earliest times to 1800. Discussion of plays, playwrights, actors, costumes, and scenic arts of each historical period. Offered first semester of alternate years, beginning in 1970-71.
- 3358 The Modern Theatre (3-0)**  
Study of theatre art from 1800 to the present. Offered first semester of alternate years only, beginning in 1971-72.
- 3418 Playwriting (3-0)**  
Principles of writing for stage presentation. Offered first semester of alternate years, beginning in 1970-71.
- 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. Thesis. Examination by a committee of faculty members. May be taken only once for credit. Offered second semester.
- 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.

#### GENERAL SPEECH

- 1101 Choral Reading (0-2)**  
A laboratory for Drama/Speech 3205: Oral interpretation, 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 Drama/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 head, 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 laboratory will be Drama/Speech 1103. Not open to students who are enrolled in or have received credit for Drama 3103.

**3104 Speech for the Bilingual Student (3-4)**

A course designed for the bilingual student who wishes to improve his oral English. 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 laboratory is Speech 1104.

**3110 Phonetics (3-0)**

The study of speech sounds, with emphasis on the physical nature of voice production. IPA transcription is used as a tool, with practice in the ability to describe standard speech, foreign speech, and pathological speech defects.

**3205 Oral Interpretation (3-2)**

Study and practice of the techniques of oral interpretation of literature. The laboratory will be Speech 1101: Choral Reading. Not open to students who are enrolled in or have received credit for Drama 3205.

**3305 Oral Interpretation: Problems and Projects (3-4)**

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

**3315 Language Development (3-0)**

Theory of the development of speech and language from the birth cry to normal acquisition of language. Factors influencing speech, *i.e.*, intelligence, environment, age, sex, hearing. Analysis of current research. Not open to students who are taking or have received credit for Pathology 3315. Offered first semester.

**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 Education (3-0)**

For teachers of speech in secondary schools, emphasizing the development of an effective speech program, methods of criticism, correction of speech difficulties, and direction of speech activities. Required of all-levels education majors who intend to teach on the secondary level. Offered first semester.

**3351 Theatre Arts for the Elementary School Teacher (3-4)**

Methods of recognizing and developing the creativity of elementary school children through the techniques of drama and theatre. Emphasizes understanding the needs of children, techniques of motivation, and development of impersonation, improvisation, playmaking, and other devices as tools of learning. Participation in theatre for the elementary school child. Not open to students who are enrolled in or have received credit for Drama 3351. Offered first semester.

**3352 Theatre Arts for the Secondary School Teacher (3-4)**

Problems and projects in the use of theatre arts to develop the secondary school student and to teach specific subject matter. Participation in theatre for the secondary school student. Not open to students who are enrolled in or have received credit for Drama 3352. Offered second semester.

**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. Thesis. Examination by a committee of faculty members. Offered first semester.

**3431 Seminar in Bilingual Speech**

Independent research and supervision of bilingual speech students in controlled laboratory situations, and special projects guided by a senior faculty member. Practice with training schedules and lesson plans for bilingual speech training. Written and oral reports. Examination by a committee of faculty members. May be taken twice for credit.

**RHETORIC AND PUBLIC ADDRESS**

**3101 Public Speaking (3-0)**

Study and practice of the inventing, arranging, phrasing, and presenting of ideas to audiences.

**3102 Speeches for Special Occasions (3-0)**

A course for students who are not speech majors but who desire work in public speaking beyond Speech 3101. Not open to drama or speech majors. *Prerequisite:* Speech 3101, or permission of the department head.

**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<sup>4</sup> 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. Not open to freshmen. Not open to students who are taking or have received credit for Drama 3290. Offered first semester.

**3306 Discussion (3-0)**

The principles and methods of group deliberation. Participation in and leadership of various forms of group inquiry — the forum, colloquy, symposium, case conference, and others. Offered first 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. Offered second semester of alternate years, beginning in 1970-71.

*School of Liberal Arts*

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- 3414 Contemporary Rhetorical Theory (3-0)**  
Study of the contributions to theories of persuasion produced by recent research in speech and social psychology. Offered second semester of alternate years, beginning in 1971-72.
- 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. Thesis examination by a committee of faculty members. 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 1970-71.
- 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 1970-71.
- 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. Not open to students who are enrolled in or have received credit for Drama 3491. Offered second semester.

**SPEECH PATHOLOGY**

- 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 of the development of speech and language from the birth cry to normal acquisition of language. Factors influencing speech — *i.e.*, intelligence, environment, age, sex, hearing. Analysis of current research. Not open to students who are taking or have received credit for Speech 3315. Offered first semester.



**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.

**3441 Clinical Practicum in Speech Pathology and Audiology I**

Offered first semester.

**3442 Clinical Practicum in Speech Pathology and Audiology II**

Offered second semester.

**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 Mexican American 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 head.

**3345 The Rhetoric of Mexican American 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 head.

**FOR GRADUATE STUDENTS ONLY**

*Prerequisite: Twelve semester hours of advanced courses in drama, speech, or speech pathology, and a bachelor's degree.*

**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**

**3526 Problems in Creative Dramatics and Children's Theatre**

**3529 Seminar in Playwriting**

**SPEECH**

GENERAL SPEECH

**3541 Speech Education I**

**3542 Speech Education II**

RHETORIC AND PUBLIC ADDRESS

**3521 Rhetoric and Politics**

**3530 Rhetoric of the Deliberative Assembly**

**3531 Seminar in the Classical Rhetorical Tradition**

**3532 Seminar in Contemporary Problems in Rhetoric and Public Address**

**3553 Rhetoric of International Relations**

PATHOLOGY

**3560 Seminar in Non-fluency**

**3561 Seminar in Cleft Palate**

**3562 Seminar in Aphasia**

**3563 Seminar in Cerebral Palsy**

**3564 Audiometry**

**3565 Seminar in Articulation Disorders**

## ENGLISH

JOHN O. WEST, *Head**Benedict Professor SONNICHSEN*

*Professors* BRADDY, BURLINGAME, LEACH, PAST, SMALL, WEST;  
*Associate Professors* BLANSITT, COLTHARP, DAY, JAMES, RICHESON, STAFFORD,  
 W. TAYLOR, WHITE; *Assistant Professors* COLLINGWOOD, EHMANN, ESSLINGER,  
 HERNANDEZ, LACEY, MORTENSEN, QUARM, SIMMONS, SMITH, TEMPLE, WADDELL,  
 R. WALKER; *Instructors* ANTONE, BOLEY, BRATCHER, CERVENKA, CORN, COTTON,  
 DESHARNAIS, ELERICK, ESCH, ETHERIDGE, GLADSTEIN, GOLDBERG, GREEN, HEINEMANN,  
 JUSTICE, KISKA, LAWSON, MACEK, MILNARICH, SPRINGSTEAD, STROUD, VISE, C. WALKER,  
 WEBB, WRIGHT; *Teaching Assistants* BREITEGAN, CARR, EDWARDS, ESKEW, GILSON,  
 HOUGHAM, KHA, TAYLOR, TRASK.

For the degree of Bachelor of Arts and the degree of Bachelor of Science in the Sciences a minimum of twelve semester hours in English are required: English 3101-02 and either 3211-12, 3213-14, or 3215-16.

**B.A. Degree** — Specific course requirements for the English major are English 3211, 3212, 3320, 3321; twelve other advanced hours in English including six hours of 3400 level courses but not including more than six hours of Creative Writing courses; History 3354 and 3355. 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 Head for details.

Students planning to take graduate work in English are advised to take 3411, 3413, and 3419.

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

1. The College Entrance Board's Advanced Placement Examination, on which
  - a) A score of 3 or higher will give six hours of credit in English 3101-02 with grades of "A" in each semester;
  - b) A score of 2 will be evaluated locally, and the papers meriting advanced placement credit will be given "B" in English 3101.
2. The College Entrance Board's Achievement Test in Composition, on which a score of 550, together with an SAT Verbal Score of 550, will give three hours of credit in English 3101, scores of 550-599 on the Achievement Test being recorded as "B" and scores of 600 and above being recorded as "A."

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*

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- 3101 Freshman Composition (3-0)**  
Fundamentals of composition: practice in organizing and writing expository prose; improvement of vocabulary and reading skills.
- 6101 Communication (6-0)**  
Fundamentals of oral and written communication: practice in organizing expository prose; study and practice in public address; improvement of vocabulary, speech, and reading skills. Substitutes for English 3101 and Speech 3101.
- 3102 Freshman Composition (3-0)**  
Further practice in composition, in vocabulary improvement, and in reading comprehension; emphasis on writing a research paper and mastering research techniques. *Prerequisite:* English 3101.
- 3211 English Literature (3-0)**  
English literature from the beginning to Samuel Johnson. Required of all English majors. *Prerequisite:* English 3102.
- 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 3102.
- 3214 Appreciation and Analysis of Drama and Poetry (3-0)**  
Attention to contemporary works as well as to the historical development of the genres. *Prerequisite:* English 3102.
- 3215 World Literature in Ancient, Medieval, and Early Renaissance Times (3-0)**  
The works of such writers as Lao Tzu, Homer, Aeschylus, Sophocles, Euripedes, Vergil, St. Augustine, Dante, Boccaccio, Chaucer, Montaigne, Cervantes, and Shakespeare. All foreign literatures are read in modern translations. *Prerequisite:* English 3102.
- 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 3102.
- 3220 Introduction to Linguistics (3-0)**  
Introduction to modern language studies with emphasis on contemporary as opposed to historical linguistics. *Prerequisite:* English 3102.
- 3269 Technical Writing (3-0)**  
Written and oral reports: assembling material, organizing, writing, and revising. *Prerequisite:* English 3102.
- ALL 3300 courses require as prerequisite completion of one of the six hour units of sophomore level courses: English 3211-12, or 3213-14, or 3215-16. General prerequisite: Junior standing for all 3300 or 3400 level courses.**
- 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.
- 3309 The Structure of the English Language (3-0)**  
Investigation of Modern English: a study of modern analyses of the language. *Prerequisite:* Six hours sophomore English. *Recommended prerequisite:* English 3220 or Speech 3110.

- 3310 Literature of the Mexican American (3-0)**  
Study of the Mexican American culture in the United States as reflected in literature. *Prerequisite:* Six hours sophomore English.
- 3311 American Literature (3-0)**  
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.
- 3312 American Literature (3-0)**  
Representative writers from the Civil War to the present, with emphasis on major figures from Whitman to Faulkner. *Prerequisite:* Six hours sophomore English.
- 3313 The American Novel (3-0)**  
The representative American novels and novelists from 1787 to the present. *Prerequisite:* Six hours sophomore English.
- 3314 The American Drama (3-0)**  
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 sophomore English.
- 3315 Literature of the Black American (3-0)**  
Study of the Black American in the United States as reflected in literature. *Prerequisite:* Six hours sophomore English.
- 3316 Medieval English Literature (3-0)**  
Medieval English literature in translation from 1066 to Chaucer: romances, visions, satires, and the morality play. *Prerequisite:* Six hours sophomore English.
- 3319 Renaissance Prose and Poetry (3-0)**  
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.
- 3320 Shakespeare: Earlier Plays (3-0)**  
Detailed study of the major plays composed before 1601, with a rapid reading of others belonging to the same period. Required of all English majors. *Prerequisite:* Six hours of sophomore English.
- 3321 Shakespeare: Later Plays (3-0)**  
Detailed study of some of the great tragedies, followed by a more rapid examination of the other plays written after 1600. Required of all English majors. *Prerequisite:* Six hours sophomore English.
- 3322 Elizabethan and Jacobean Drama (3-0)**  
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 sophomore English.
- 3323 Seventeenth-Century Prose and Poetry (3-0)**  
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.
- 3329 Early Neo-Classicism (3-0)**  
The background of the English classical period in the writers of the Restoration. *Prerequisite:* Six hours sophomore English.
- 3330 The Neo-Classical Age (3-0)**  
Pope through Johnson exclusive of the pre-romantics. *Prerequisite:* Six hours sophomore English.
- 3331 Early Romantic Literature (3-0)**  
A study of the works of Burns, Blake, Wordsworth, Coleridge, Lamb, Hazlitt, and their contemporaries. *Prerequisite:* Six hours sophomore English.

*School of Liberal Arts*

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- 3332 Late Romantic Literature (3-0)**  
A study of the works of Byron, Shelley, Keats, Landor, Hunt, DeQuincey, and their contemporaries. *Prerequisite:* Six hours sophomore English.
- 3338 Early Victorian Literature (3-0)**  
The works of Tennyson, Browning, Macauley, Carlyle, and their contemporaries. *Prerequisite:* Six hours sophomore English.
- 3339 Late Victorian Literature (3-0)**  
The works of Anold, Newman, Ruskin, Pater, Stevenson, Rosetti, Meredith, Morris, Swinburne, Hardy, Hopkins, Housman, and the early Yeats. *Prerequisite:* Six hours sophomore English.
- 3344 Contemporary Poetry (3-0)**  
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. May be repeated for credit when the subject varies.
- 3347 The English Novel (3-0)**  
Prose fiction in England from the Middle Ages to the nineteenth century, particular attention being given to the novels of Richardson, Fielding, Smollett, Walpole, Burney, Jane Austen, and Scott. *Prerequisite:* Six hours sophomore English.
- 3348 The English Novel (3-0)**  
A continuation of English 3347, with study of typical works of Dickens, Thackeray, the Brontes, George Eliot, Hardy, and Meredith. *Prerequisite:* Six hours sophomore English.
- 3352 The English Novel (3-0)**  
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 sophomore English.
- 3353 The Short Story (3-0)**  
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.
- 3355 The Drama in English since 1660 (3-0)**  
Historical Study of dramatic theory and convention in England from the Restoration to the present, through reading of representative plays of each period. *Prerequisite:* Six hours sophomore English.
- 3360 The World of Books — Origins and Design (3-0)**  
Preparation of manuscripts for publication, design of the format, history of printing and binding, distribution and publicity to establish a book. *Prerequisite:* Six hours sophomore English.
- 3361 Creative Writing (3-0)**  
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:* Six hours sophomore English.
- 3362 Nonfiction Writing (3-0)**  
Study and practice in the techniques of contemporary nonfiction. Scope includes analysis of magazine article types and their structure. Attention is given to the use of fictional techniques in nonfiction. *Prerequisite:* Six hours sophomore English.

- 3367 Advanced Creative Writing (3-0)**  
Study and practice in the techniques of contemporary creative writing. Contin-  
uance and intensification of the techniques presented in English 3361. *Prerequi-  
site:* English 3361.
- 3368 Advanced Fiction Writing (3-0)**  
Study and practice in the techniques of contemporary fiction writing, with par-  
ticular attention to dramatic structure as applicable to both the short story and  
longer forms. *Prerequisite:* English 3367.
- 3370 The Writing of Poetry (3-0)**  
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.
- 3371 Life and Literature of the Southwest (3-0)**  
The social background of the Southwest and its reflection in literature. *Prerequi-  
site:* Six hours sophomore English.
- 3372 Folklore (3-0)**  
The types and characteristics of folk literature with particular emphasis on the  
folklore of the Southwest and Mexico. *Prerequisite:* Six hours sophomore English.
- 3373 Life and Literature of the South (3-0)**  
Literature of the Old and New South, especially as it reflects the institutions and  
traditions of the region. *Prerequisite:* Six hours sophomore English.
- 3374 Folklore of the Mexican American (3-0)**  
Study of the Mexican American culture in the United States as reflected in  
folklore. *Prerequisite:* Six hours sophomore English.
- 3375 Folklore of the Black American (3-0)**  
Study of the Black American in the United States as reflected in folklore. *Prere-  
quisite:* Six hours sophomore English.
- 3385 Russian Literature in Translation (3-0)**  
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.
- 3386 Background Readings (3-0)**  
A course of variable content that will provide readings of foreign literatures in  
translation, as background support for significant portions of English and Amer-  
ican literature. May be repeated once for credit when the topic varies. *Prere-  
quisite:* Six hours sophomore English.
- 3395 Linguistics in the Classroom (3-0)**  
A study of the use of linguistic theory in the teaching of English. Meets the re-  
quirements for English 3309 for undergraduate secondary education majors. *Pre-  
requisite:* Six hours sophomore English.
- 3411 Milton (3-0)**  
An introduction to the work and times of John Milton. *Prerequisite:* Six hours of  
advanced courses in English.
- 3413 Chaucer (3-0)**  
A survey of the life and works of Geoffrey Chaucer with emphasis on *The Canter-  
bury Tales*. *Prerequisite:* Six hours of advanced courses in English.
- 3414 Literary Criticism (3-0)**  
The development of literary theory as seen in the major critics from Plato to the  
present. *Prerequisite:* Six hours of advanced courses in English.
- 3419 The Foundations of the English Language (3-0)**  
The development of English from Old through Middle English, with selected  
readings in the original. *Prerequisite:* Six hours of advanced courses in English.  
*Recommended prerequisite:* English 3220 or 3309.

**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.

**3435 Studies in American Thought\* (3-0)**

The origin and significance of the major thought patterns of American Literature. *Prerequisite:* a 3.0 average in nine hours of advanced courses in English. Consult the English Department Head before registering.

**3440 Special Studies\* (3-0)**

Pro-seminar open to English majors, the topic to vary with the professor in charge. See Department Head 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.

**1455-6455 Workshop in the Teaching of English (1 to 6-0)**

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.

**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.

**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.

**3480 Old English Language and Literature (3-0)**

A concentrated study of Old English, with selected readings from Anglo-Saxon literature in the original. *Prerequisite:* Six hours of advanced courses in English.

\* Pro-Seminar.

### FOR GRADUATE STUDENTS ONLY

*Prerequisite:* Fourth-semester college level proficiency in French, German, or Spanish; twelve semester hours of advanced courses in English, and a Bachelor's degree. Foreign students may be required to take special proficiency tests in the English language before being allowed to register. Write Head, Department of English, for details.

*M.A. degree requirements:*

1. Thirty semester hours of graduate courses in English, at least twenty-four hours of which are courses numbered between 3500 and 3600; the remainder may consist of courses numbered between 3400 and 3600, provided these courses were not taken to satisfy requirements for the B.A. degree.
2. Each candidate for the M.A. degree will be required to make a satisfactory score on a written comprehensive examination.
3. Each candidate for the M.A. degree will submit to the committee on graduate studies evidence of his scholarly ability in one of two ways:
  - a) He may submit two suitably bound graduate seminar research papers, the product of courses entitled *Studies*.
  - b) By special permission of the graduate committee he may submit a six hour thesis (including English 3598 and 3599 in lieu of six hours of course work), suitably bound.

A student may include a minor in his program only by approval of the committee on graduate studies.



**GENERAL COURSES**

- 3511 Scholarly Methods and Bibliography (3-0)**  
The basic course for graduate work in English. Designed to equip the graduate student with effective techniques for research and scholarly writing in the field of English.
- 3515 Graduate Reading Course (3-0)**  
Reading of a selected list of English and American masterpieces. No formal classes held, but discussion groups meet regularly.
- 3565 Studies in Folklore\* (3-0)**
- 3598-99 Master of Arts Thesis**  
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)**
- 3525 Studies in American Transcendentalism\* (3-0)**
- 3535 Studies in American Thought\* (3-0)**
- 3540 Studies in Melville and Hawthorne\* (3-0)**
- 3541 Studies in American Fiction\* (3-0)**

**ENGLISH LITERATURE**

- 3549 Readings in Old English Translation (3-0)**
- 3550 Studies in Chaucer\* (3-0)**
- 3551 Readings in Middle English Literature (3-0)**
- 3560 Studies in Shakespeare\* (3-0)**
- 3561 Readings in 17th Century English Literature (3-0)**
- 3562 Studies in 18th Century English Literature\* (3-0)**
- 3563 Studies in 19th Century English Literature\* (3-0)**
- 3564 Studies in the English Novel\* (3-0)**

**LANGUAGE AND LINGUISTICS**

- 3570 Studies in English as Language\* (3-0)**

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

## HISTORY

KENNETH K. BAILEY, *Chairman*

*Professors Emeritus* PORTER, STRICKLAND, WALLER;

*Professors* BAILEY, FULLER, KNIGHT, MCNEELY, TIMMONS;

*Associate Professors* CREIGHTON, JACKSON, SHOVER; *Assistant Professors* CLARK, ISRAEL, KAWASHIMA, KUZIRIAN, ROLAK; *Instructors* BROADDUS, BURKE, ISETT.

### 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: The United States; Hispanic America; Russia and Asia; Europe, except Russia.

**Honors Courses** — Qualified students interested in Honors Courses should consult the chairman of the department. Honors courses which have been offered include: History 3102, 3201, 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: Six hours of History.*

**3201 History of Western Civilization, to 1648 (3-0)**

The ancient and classical civilizations, medieval Europe, Renaissance and Reformation, expansion of Europe, development of national states, and the Thirty Years War.

**3202 History of Western Civilization, since 1648 (3-0)**

Age of absolutism, development of parliamentary government in England, the Enlightenment, the era of the French Revolution and Napoleon, the Industrial Revolution and its impact, nationalism, intellectual currents, imperialism, World War I, the dictatorships, the world in conflict since 1939.

**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.

**3207 The Afro-American, to 1865 (3-0)**

[New]  
A survey of the black man's struggles in American society, emphasizing the African heritage, the sources of racism, a comparative study of slavery as an institution in the Americas, the plight of the Free Negro, the Abolitionist Movement, and the end of legal bondage.

**3208 The Afro-American, since 1865 (3-0)**

[New]  
A continuation of 3207, emphasizing the Reconstruction era, the civil-rights laws, the expansion of Jim Crow, the Niagara Movement, the growth of the Black Bourgeoisie, the Civil-Rights Movement, and the onset of black liberation movements.

- 3209 The Mexican-American (3-0)** [New]  
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.
- 3210 The Desert Frontier (3-0)** [New]  
A study of the Nineteenth-Century American Southwest, the arid frontier, and the area of the international boundary.

#### 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.

- 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 Era of Sectional Conflict, I: 1820-1860 (3-0)**  
Seeds of civil war: Missouri Compromise, nullification, slavery and abolition, Manifest Destiny, nativism, and the disruption of parties.
- 3305 Era of Sectional Conflict, II: 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.
- 3309 American Military History (3-0)**  
Evolution of American military policy, the causes, conduct, and consequences of American wars, analysis of important battles and leaders, peace movements.
- 3310 American Legal History (3-0)** [New]  
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.
- 3311 History of American Foreign Relations, to 1900 (3-0)**  
The growth and refinement of the concepts of United States diplomacy and their economic and geopolitical expansion, the frontier and foreign policy, the legend of isolationism, and the foundations for a twentieth-century industrial diplomacy.

- 3312 History of American Foreign Relations, since 1900 (3-0)**  
A world in change during the American Century; the goals and tactics of the Open Door policy; peace, war and revolution with special emphasis on Wilson and World War I, Truman and containment, and the American response to revolutionary Mexico, Russia, China, and Cuba.
- 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.
- 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.
- 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 West, 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 West, 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. *Prerequisite:* History 3321 or consent of instructor.
- 3325 History of Mass Media in America (3-0)** [New]  
*Development and role of newspapers, books, radio, television, magazines, and movies in the American life, with particular emphasis on the communications revolution of the twentieth century.*
- 3326 America and Europe (3-0)** [New]  
Trans-Atlantic contact from the Vikings to NATO. Observers in each continent view the other. Particular emphasis to the changing conception of America's relationship to Europe as the United States develops from infancy to adult nation.
- 3327 America and Asia (3-0)** [New]  
Trans-Pacific contact from the earliest search for a passage to India to the Vietnam War. America's long dream of the China market and its fickle friendship with Japan. Particular emphasis to public attitudes and the role of symbol and myth in shaping American foreign policy.
- 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 Civilization, to 1250 (3-0)** [New]  
Social, political, and economic survey of the Muslim world from Muhammad to the Turco-Mongol domination, and from Spain to India. Emphasis on the development of institutions.
- 3337 Islamic Civilization, since 1250 (3-0)** [New]  
The Near East and North Africa from the rise of the Ottoman Empire to the challenge of modernization. Political, social, and economic response to internal needs and external influences.
- 3338 Economic History of Modern Europe and the Near East (3-0)** [New]  
The European Industrial Revolution and its local and foreign impact to the present, with attention to emerging capitalist business institutions, induced social change, and political response.
- 3339 The Near East and North Africa, since 1800 (3-0)** [New]  
The conflict of colonialism and nationalism in the Islamic world; Europe and the Eastern Question; the internal problems of modernization in developing nations.
- 3341 The History of Spain and Portugal (3-0)** [New]  
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.
- 3342 The Spanish Borderlands (3-0)** [New]  
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.
- 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, and the Organization of American States.
- 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 native peoples, European discovery, exploration, conquest and colonization of the Caribbean and Spanish North America, colonial institutions and culture, 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.
- 3351 England Under the Tudors (3-0)**  
History of England during the Tudor monarchy, 1485-1603, emphasizing the intellectual, religious, economic, and political factors contributing to the growth of the modern state.
- 3352 England Under the Stuarts (3-0)**  
Constitutional, political, religious, and social developments in England under the early Stuarts, the Interregnum, and the later Stuarts.
- 3354 England, to 1588 (3-0)** [Formerly 3203]  
Major developments in England from its prehistory to the Armada.

*School of Liberal Arts*

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- 3355 England, since 1588 (3-0)** [Formerly 3204]  
A continuation of History 3354 to the present. *Prerequisite:* History 3354, or permission of instructor.
- 3356 English Thinkers and Their Ideas (3-0)** [New]  
An Intellectual History of England from Bede to Russell, seen in the European context. Lectures and discussions.
- 3357 History of Greece (3-0)** [Formerly 3370]  
The development of Greek civilization, the rise and decline of the city-state, from the Bronze Age to the death of Philip of Macedon in 336 B.C.
- 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 The Renaissance and Reformation (3-0)**  
Political, social, economic developments in the 14th century, the Papacy, the Renaissance in Italy and northern Europe, the Protestant movement, the Catholic Reformation, religious conflict, and the settlement of 1648.
- 3364 The Old Regime (3-0)**  
Absolutism in France, Prussia, Austria, Russia, social and economic trends, international relations, scientific and intellectual revolution, enlightened despotism.
- 3365 The French Revolution and Europe (3-0)**  
The causes of the Revolution, the Constitutional Monarchy, the Reign of Terror, the Thermidorian Reaction, the Directory, and the Revolution in its European context.
- 3368 Contemporary Europe (3-0)**  
World War II, the United Nations, the Cold War, the rising tide of nationalism in Asia, the Middle East, and Africa.
- 3369 Military History of Modern Europe (3-0)**  
Survey of the military history of the major European powers from the end of the eighteenth century, methods of raising armies, the causes, conduct, and consequences of major wars, analysis of important battles and leaders, NATO and the current scene.
- 3373 History of Central Europe to 1815 (3-0)** [New]  
Political, economic, social, and cultural history of Germany, the Habsburg Empire, and Poland, from their origins to the Congress of Vienna.
- 3374 History of Central Europe since 1815 (3-0)** [New]  
Political, economic, social, and cultural history of Germany, the Austro-Hungarian Empire, Poland, and Czechoslovakia from the Congress of Vienna to the present.
- 3375 France in the Nineteenth Century (3-0)** [Formerly 3359]  
The development of France into a democratic republic from the rise of Napoleon I to the establishment of the Third Republic.

- 3376 Modern Europe, 1815-1870 (3-0)** [New]  
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)** [New]  
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, 1919-1939 (3-0)** [New]  
The development of totalitarian dictatorships in Italy, Germany, and Russia; the position of the Western democracies, particularly France and England; and the background of World War II.
- 3381 Reading Course for Honors Students (3-0)**  
Reading and discussion of topics in European or American history. Instructor's permission necessary.
- 3382 Research Course for Honors Students (3-0)** [New]  
Preparation of a research paper in European or American history. *Prerequisite:* History 3381 or consent of instructor.
- 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.
- 3406 Studies in Frontier History (3-0)** [New]  
Problems, episodes, and trends in the history of the American frontier; comparative study of frontiers in other areas of the world. Assigned readings, class discussions, and emphasis on undergraduate research. *Prerequisite:* History 3321-22 or consent of instructor.

## 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)**
- 3506 The Civil War Era, 1850-1876 (3-0)**
- 3510 The Era of Reform, 1890-1917 (3-0)**
- 3513 The South since the Civil War (3-0)**
- 3514 Western America (3-0)**
- 3515 Problems in American Diplomatic History (3-0)**
- 3517 American Thought (3-0)**
- 3518 Problems in the History of Texas (3-0)**
- 3519 Spain in the American Southwest (3-0)**
- 3520 Ideologies in Modern European History (3-0)**
- 3521 English Historical Writing (3-0)**
- 3550 Modernization and the Middle East (3-0)**
- 3581 SEMINAR: Historical Method and Historiography\* (3-0)**
- 3582 SEMINAR: Studies in European History† (3-0)**

*School of Liberal Arts*

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- 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**
- 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.



**MASS COMMUNICATION**

VIRGIL C. HICKS, *Head* (Broadcasting)

JOHN J. MIDDAGH, *Head* (Journalism)

*Professors* HICKS, MIDDAGH; *Instructor* PEREZ;

*Consultant in Publicity and Public Relations*, STEELE JONES.

*Teaching Assistants* CHAPMAN, BROWN.

**B.A. Degree** — Specific courses required for the JOURNALISM MAJOR are Journalism 4207, 3201-02, 3305 and 3312, and six additional advanced hours. Specific courses required for the BROADCASTING MAJOR are RA-TV 3102, 3214-15, 3330-31 and six advanced hours.

(Upon approval of the Head of the Department, Business Administration 3364 will be accepted for credit as part of a major or minor in Journalism.)

**JOURNALISM**

**For Undergraduates**

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

**3101 Introduction to Journalism (3-0)**

Orientation course into the background of newspaper work and other journalistic fields. Brief history of American newspapers. Designed to acquaint students with general newspaper practices.

**3102 Introduction to News Writing (3-0)**

A beginning course covering basic principles of news writing and editing, making use of exercises and assignment materials necessary to practice and apply the principles.

**3106 Introductory Course in Public Relations (3-0)**

Orientation course to acquaint the student with the various public relations media and how to use them. Set up on an elementary basis primarily for the non-journalism and radio major, this course presents the role of public relations in modern business, education, government, civic affairs, etc. Instruction and practice in writing news releases for newspapers, radio and television.

**3201 News Gathering and Reporting (2-4)**

Instruction and practice in interviewing and writing; Discussion of news sources, news values, and various types of news stories; study of the organization of the newspaper staffs and the news gathering associations. Required of all students majoring in Journalism. *Prerequisite:* Sophomore standing including English 3101-02.

**3202 News and Copy Reading (2-4)**

Theory of writing newspaper copy and writing headlines. Special instruction by leading newspaper men and women. Required of all students majoring in Journalism. *Prerequisite:* Sophomore standing including English 3101-02.

**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.

**3204 Typography (2-3)**

Emphasis on the mechanics of typography and the understanding of services offered by the typographer. The student learns use and recognition of historical and most widely used type families. The basic function of type, to convey ideas and information, is stressed. (Sophomore level.)

- 4207 Elementary Photography (\$5) (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.
- 3308 Fields of Photography (\$5) (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.
- 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, and 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.
- 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.
- 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 towards graduation. No senior student may take the 1104 course for credit towards graduation.

## BROADCASTING

Upon approval by the Head of the Department. Education 3412 will be accepted for credit as part of a major or minor in Radio-Television.

### 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 Introduction to Radio and Television (3-0)**  
An introductory course to acquaint the beginning student with basic studio and control room equipment and practices. *Prerequisite:* Radio 3101, or consent of the head of the department.
- 3105 Radio-Television News (2-3)**  
News reporting and writing for radio and television. Processing A.P. wire copy. Skills of the radio-television news announcer.
- 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 (3-2)**  
An advanced course in gathering, processing, and reporting news for Radio and Television. *Prerequisite:* Junior standing.
- 3320 Television Production I (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 Television Production II (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 Production in Educational Television (3-0)**  
Television production problems peculiar to educational television. A companion course to Education 3413, providing opportunity for participation in the production and direction of programs planned for classroom viewing.
- 3430 Television-Radio Station Management (2-3)**  
Complete survey of management problems in the television-radio 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 television-radio majors. *Prerequisite:* Six hours of television-radio 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.
- 3413 Educational Television and Radio: Preparation and Presentation of In-School Programs (3-0)**  
A survey course in the uses of radio and television for classroom instruction. *Prerequisite:* Junior standing.

#### **RADIO STATION KVOF and KVOF - FM**

##### **For Undergraduates**

- 1104-05 Radio Station KTEP (0-3)**  
Work on the staff of Radio Station KTEP. *Prerequisite:* Consent of the head of the department.
- 1204-05 Radio Station KTEP (second year) (0-3)**  
Work on Radio Station KTEP with increased responsibility. *Prerequisite:* Radio 1104-05 and consent of the instructor.
- 1304-05 Radio Station KTEP (third year) (0-3)**  
Work on Radio Station KTEP with increased responsibility. *Prerequisite:* Radio 1204-05 and consent of the instructor.
- 1404-05 Radio Station KTEP (fourth year) (0-3)**  
Work on Radio Station KTEP with increased responsibility. *Prerequisite:* Radio 1304-05 and consent of the instructor.

## MILITARY SCIENCE

COLONEL HERBERT A. SMITH, JR., *Commandant*

*Professor* COLONEL SMITH;

*Assistant Professors* MAJOR HARPER, CAPTAIN DILLON;

*Instructors* SERGEANT MAJOR SKINNER, MSG FISHER.

**GENERAL:** Courses offered by this department are designed to produce junior commissioned officers, who by their education, training, and demonstrated leadership qualities, are considered suitable for continued development as officers in the United States Army. 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, poise, 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. 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.* Normally a student may only enroll in Military Science courses that correspond to his academic year in college, and he may be permitted to begin ROTC only if sufficient time remains for him to complete his Military Science studies by the time he is scheduled to obtain his baccalaureate degree. Enrollment is limited to students who can qualify for a degree prior to their 28th birthday. Exemptions may be granted by the Professor of Military Science (PMS) for as much as one year of the Basic Course for students having satisfactorily completed three years of high school ROTC. Veterans with four or more months of active military service may be exempted, by the PMS, from the entire Basic Course and apply for admission to the Advanced Course upon attaining approximate junior standing.

To enroll in ROTC a student must be a full-time student carrying 12 or more semester hours, physically qualified as evidenced by a recent physical examination, and be a male citizen of the United States, or must qualify for U. S. citizenship prior to admission to the Advanced Course. To accommodate transfer students from Junior Colleges, other college or universities not having a Senior ROTC Program, or sophomores at U. T. El Paso, who wish to obtain an Army Officers' commission through ROTC; it is possible to qualify for the two-year Army ROTC Program. Application for the two-year Army ROTC Program must be made in January of the year that the student approaches junior standing. Upon satisfactorily passing a mental screening test, a physical examination and approval of applicant by PMS, the student must attend a six weeks Basic Summer Training Camp, in lieu of the Basic Course, and thereby qualify for admission to the Advanced Course.

*Advanced Course.* Upon satisfactorily completing the Basic Course (MS I and MS II) or the Basic Summer Camp under the two-year ROTC Program (attended between student's sophomore and junior years) or exemption from the Basic Course by the PMS for four or more months active military service, a student may qualify for admission to the Advanced Course provided he is selected by the PMS, based upon a mental screening test, a physical examination, and the student's overall academic performance. If accepted for the Advanced Course the student is required to execute a contract with

### *School of Liberal Arts*

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the government whereby he agrees to enlist in the Army Reserve for a period of six years, complete the Advanced Course, accept a commission if offered, and serve on active duty for two years.

**SCHOLARSHIPS:** Several hundred Army ROTC scholarships are available annually. All scholarships are on a national competitive basis with some emphasis placed upon geographical distribution. Four-Year Army ROTC scholarships are for high school graduates. Interested high school seniors should apply by December of their senior year to: Commanding General, Fourth US Army, ATTN: AKAAG-RR, Fort Sam Houston, Texas, for information packets and application forms. Three-Year Army ROTC scholarships are for freshmen at U.T. El Paso who have at least three years of undergraduate work remaining before their graduation. Two-Year Army ROTC scholarships are exclusively for sophomores at U.T. El Paso who have completed or are about to complete the Basic Course (MS I and MS II). Freshmen interested in the three-year scholarships and sophomores interested in the two-year scholarships should obtain application forms from the office of the PMS., Memorial Gym by January of either their Freshmen or Sophomore year. One-Year scholarships are available for MS III students, who have a minimum of one year of school remaining. Application may be obtained from the office of the PMS prior to May of their Junior Year.

**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. Non-scholarship Advance Course cadets are paid \$50.00 per month for a maximum of twenty months, excluding the six week Advanced Summer Training Camp, where pay is at the rate of \$193.20 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 \$50.00 per month for the full period of their scholarship, except for the six week Advanced Summer Training Camp, where the pay is at the rate of \$193.20 per month. 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 \$115.20 per month.

**FLIGHT TRAINING:** Flight training at a local flying school is available in a limited quota to 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 (three years for those taking ROTC Flight Training). 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, excepting those re-

quiring professional graduate work. Following graduation, the newly commissioned officer is sent to an Orientation Course of about eight weeks duration to qualify him in his Branch, and then completes his tour of active duty through challenging assignments overseas and in the United States. Following one year's active duty, promotion to First Lieutenant can be reasonably expected with a substantial increase in pay. Likewise, upon the completion of two year's active Military Service, another substantial increase in pay will occur. 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; Individual Weapons and Marksmanship; United State Army and National Security; and Leadership Laboratory. Academic credit: One hour per semester.

#### 2201-02 Military Science II (2-1)

Map and Aerial Photograph Reading; Introduction to Operations and Basic Tactics; American Military History; Counterinsurgency; 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; Counterinsurgency; and Leadership Laboratory. *Prerequisite:* Junior standing, basic course or equivalent military training, and selection by Professor of Military Science and President of the University. 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.

\*In addition to the above schedule, Military Science I and advanced course students are required to take one 3 semester hour class per year in an elective or required academic subject approved by the PMS.

## MODERN LANGUAGES

GEORGE W. AYER, *Head*

*Professors* AYER, BEVANS, ORNSTEIN, RUFF, SHARP; *Associate Professors* CHRISTIAN, EWTON, RUSSELL, TAPPAN, WEBB; *Assistant Professors* ASTIAZARAN, BAILEY, BREWER, DAVIS, HAUGHTON, RIVERA-RODRIGUEZ, F. RODRIGUEZ, SCRUGGS;  
*Instructors* BALDWIN, JOHNSON, HERRERA, IRWIN, LANDY, NAVAR, ORTEGA.

### *Registration Instructions:*

- a) Native speakers – register for 4102, subject to placement
- b) No previous courses in the language – register for 4101
- c) Two units in high school – register for 4102
- d) One, three, or four units – confer with Department for placement.

Courses 4101-02 and 3201-02 should be taken without interruption and supplemented with Courses 3108, 3110, 3111, and 3114 as needed for fluency.

**B.A. Degree** — Special requirements for the degree of Bachelor of Arts in a foreign language: foreign language 4101-02, 3201-02 (or placement) and twelve advanced hours. Completion of course 3201-02 in a second foreign language. For Spanish majors, History 3347 or 3348 or 3349; for French majors, History 3365 or 3375 or equivalent. Major examination required. Teaching majors who wish departmental recommendation must meet the same requirements, plus those for the certificate on page 66 of this catalog. First semester, basic courses numbered 4101 are not counted in addition to two units in the same language in high school.

*General prerequisite:* Junior standing in the language concerned for all 3300 or 3400 level courses.

## FRENCH

### **4101-02 Fundamentals of Reading, Writing and Speaking (5-0)**

Oral drill, dictation, grammar, reading of elementary and intermediate texts, laboratory and written exercises.

### **3110 Civilisation française (3-0)**

Illustrated lectures in intermediate French. Extensive use of travelogs, slides and films of everyday life to teach conversational French. Intended as a supplement to required courses for students who do not already speak French. *Prerequisite:* French 4101.

### **3111 La France contemporaine (3-0)**

A conversational course in intermediate French based on a study of the provinces of France. Extensive use of slides, films, and travelogs to teach vocabulary and conversational usage. A supplementary course for students who do not already speak French. *Prerequisite:* French 4101.

### **3201-02 Intermediate Readings in the Modern Period (3-0)**

Readings from standard French authors. Oral and written work in French; grammar review. *Prerequisite:* French 4102.

## For Undergraduates and Graduates

### **3321 The Literary History of France (3-0)**

A survey of French literature and culture. Conducted in French. *Prerequisite:* French 3202.

### **3332 The Classical Period (3-0)**

Representative authors of the seventeenth century, including Corneille, Moliere and Racine. *Prerequisite:* 3202.



- 3333 Masterpieces of French Literature (3-0)**  
Selected masterpieces of French literature, studied in depth. *Prerequisite:* French 3202.
- 3334 Eighteenth Century French Literature (3-0)**  
Rousseau, Diderot, Voltaire, and others. *Prerequisite:* French 3202.
- 3335 Nineteenth Century Novel: Early Period (3-0)**  
Hugo, Stendhal, Balzac, and others. *Prerequisite:* French 3202.
- 3337 Late Nineteenth and Early Twentieth Century Novel (3-0)**  
Flaubert, Zola, Daudet, France, and others. *Prerequisite:* French 3202.
- 3339 The Short Story (3-0)**  
*Prerequisite:* French 3202.
- 3341 Nineteenth Century Drama (3-0)**  
Hugo, Musset, Dumas, Becque, and others. *Prerequisite:* French 3202.
- 3357 Advanced Composition and Grammar Review (3-0)**  
*Prerequisite:* French 3202.
- 3358 Contemporary Literature (3-0)**  
Novel and drama after 1937. *Prerequisite:* French 3202.
- 3377 Lyric Poetry (3-0)**  
*Prerequisite:* French 3202.
- 3431 Sixteenth Century French Literature (3-0)**  
Rabelais, Ronsard, Montaigne, and others. *Prerequisite:* Six hours of advanced French.
- 3450 Old French Literature (3-0)**  
Queste del Graal, Perceval, Chanson de Roland, etc. (Primarily for students planning to enter graduate study). *Prerequisite:* Six hours of advanced French; also open to graduate students of English having a reading knowledge of French.
- 3457 The Historical Phonology of French (3-0)**  
The study of sound and word changes from Latin to Modern French. (Primarily for students planning to teach or to enter graduate study). *Prerequisite:* Six hours of advanced French or of Linguistics.
- 3490 Senior Seminar (3-0)**  
*Prerequisite:* Six hours of advanced French.  
May be repeated for credit when topics vary.
- 3491 Advanced Reading Course: Seminar (3-0)**  
*Prerequisite:* Six hours of advanced French.  
May be repeated for credit when topics vary.

**FOR GRADUATE STUDENTS ONLY**

*Prerequisite:* Twelve hours of advanced courses in French and a Bachelor's degree.

- 3590 Seminar (3-0)**  
May be repeated for credit.
- 3591 Graduate Reading Course: Seminar (3-0)**  
May be repeated for credit.

## GERMAN

### 4101-02 Fundamentals of Reading, Writing and Speaking (5-0)

Oral drill, dictation, grammar, reading of elementary and intermediate texts, laboratory and written exercises.

### 3110 German Civilization (3-0)

An intermediate course in conversational German. Extensive use of slides and films of everyday life to teach spoken German. A supplementary course for students who do not already speak German. *Prerequisite:* German 4101.

### 3201-02 Intermediate Readings in the Modern Period (3-0)

Readings from the nineteenth and twentieth centuries. Oral and written summaries, some grammar review. *Prerequisite:* German 4102.

### 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.

### 3321 The Literary History of Germany (3-0)

An introductory survey of German literature and culture stressing the parallel development of German institutions, thought and art forms. *Prerequisite:* German 3202.

### 3333 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:* German 3202.

### 3339 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:* German 3202.

### 3341 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:* German 3202.

### 3357 Advanced Composition and Grammar Review (3-0)

Examination of the best modern German writing styles. Original composition on topics of current interest: some correspondence and commercial letter. *Prerequisite:* German 3202.

### 3358 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:* German 3202.

### 3490 Senior Seminar (3-0)

May be repeated when topics vary. *Prerequisite:* Six hours of advanced German or consent of instructor.

## JAPANESE

### 4101-02 Fundamentals of Japanese (5-0)

An intensive course designed to enable the more mature student to master the fundamentals of a major non Indo-European language. Oral drill with a native informant. Basic structure, reading of elementary texts, laboratory. *Prerequisite:* Completion of Course 4102, or equivalent, in a foreign language with a grade of at least "B", or permission of the head of the department.

## 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.

**RUSSIAN**

**4101-02 Written and Spoken Russian (5-0)**

An intensive course designed to enable the more mature student to master the fundamentals of written and spoken Russian. *Prerequisite:* Completion of Course 4102, or equivalent, in a foreign language with a grade at least "B," or permission of the head of the department. Two double recitation hours per week.

**3108 Conversational Russian (3-0)**

Intended to broaden the vocabulary of Russian 4101 for oral use. Attention will be given to basic military terminology. *Prerequisite:* With or after Russian 4101.

**3201-02 Intermediate Readings in the Modern Period (3-0)**

Readings from the nineteenth and twentieth centuries, with emphasis upon contemporary literary, journalistic and scientific prose. Oral and written summaries; some grammar review. *Prerequisite:* Russian 4102.

**SPANISH**

**4101-02 Fundamentals of Reading, Writing and Speaking (5-0)**

Oral drill, dictation, grammar, reading of elementary and intermediate texts, laboratory and written exercises.

**3201-02 Intermediate Readings in the Modern Period (3-0)**

Readings from the nineteenth and twentieth centuries. Oral and written summaries, some grammar review. *Prerequisite:* Spanish 4102.

**3108 Conversational Spanish (3-0)**

Intended to broaden the vocabulary of Spanish 4101 for everyday use. A supplementary course for students who do not already speak Spanish. Extensive use of audio-visual aids. *Prerequisite:* With or after Spanish 4101.

**3110 Cultura Hispanica (3-0)**

Illustrated lectures in intermediate Spanish. Extensive use of slides and films of everyday life in Latin America to teach conversational Spanish. A supplementary course for students who do not already speak Spanish. *Prerequisite:* Spanish 4101.

**3111 Espana contemporanea (3-0)**

A conversational course in intermediate Spanish based on a study of the provinces of Spain. Extensive use of slides, films and travelogs to teach vocabulary and conversational usage. A supplementary course for students who do not already speak Spanish. *Prerequisite:* Spanish 4101.

**3114 Mexico contemporaneo (3-0)**

A conversational course in intermediate Spanish based on a study of city and rural life in the various regions of Mexico. Extensive use of slides, films and travelogs to teach vocabulary and conversational usage. A supplementary course for students who do not already speak Spanish. *Prerequisite:* Spanish 4101.

**For Undergraduates and Graduates**

**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. *Prerequisite:* Spanish 3202.

**3321 The Literary History of Spain (3-0)**

A survey of Spanish culture and literature, stressing the parallel development of Spanish institutions, thought and art forms. Conducted in Spanish. *Prerequisite:* Spanish 3202.

**3322 La cultura hispanica en las Americas (3-0)**

An interpretation of the culture of Spanish America through contemporary Spanish American literature. Conducted in Spanish. *Prerequisite:* Spanish 3202.

**3324 The Literary History of Mexico (3-0)**

A survey of Mexican culture and literature, stressing the parallel development of institutions, thought and art forms. Conducted in Spanish. *Prerequisite:* Spanish 3202.

*School of Liberal Arts*

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- 3325 The Novel of the Mexican Revolution (3-0)**  
A study of the principal novels of the Mexican Revolution: López y Fuentes, Azuela, Guzmán, etc. *Prerequisite:* Spanish 3202.
- 3328 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:* Spanish 3202.
- 3333 Masterpieces of Spanish Literature (3-0)**  
Extensive readings from masterpieces of Spanish literature. At least four complete works including the *Poema de Mio Cid*, *Libro de Buen Amor*, *La Celestina*, etc. *Prerequisite:* Spanish 3202.
- 3335 Nineteenth Century Spanish Novel: Early Period (3-0)**  
The Spanish novel of the first half of the nineteenth century: Fernán Caballero, Valera, Alarcón, Pereda, Pérez Galdós, Pardo Bazán, etc. *Prerequisite:* Spanish 3202.
- 3337 Nineteenth Century Spanish Novel: Later Period (3-0)**  
The Spanish novel of the second half of the nineteenth century: Palacio Valdés, Blasco Ibáñez, Pio Baroja, Pérez de Ayala, Valle Inclán, Concha Espina, etc. *Prerequisite:* Spanish 3202.
- 3339 The Cuento and the Short Story (3-0)**  
Shorter fictional forms in Spain and Spanish America from the time of Juan Manuel to the present. *Prerequisite:* Spanish 3202.
- 3341 Modern Spanish Drama (3-0)**  
The Spanish drama from the end of the eighteenth to the end of the nineteenth centuries. *Prerequisite:* Spanish 3202.
- 3356 Twentieth Century Spanish Literature: Early Period (3-0)**  
The "Generation of '98," including Unamuno, Benavente, Ortega y Gasset, Azorin, García Lorca, etc. *Prerequisite:* Spanish 3202. (Not counted in addition to Spanish 3358.)
- 3357 Advanced Composition and Grammar Review (3-0)**  
Examination of the best modern Spanish business, epistolary, journalistic and polemic styles. Original composition on topics of current interest. *Prerequisite:* Spanish 3202.
- 3359 Twentieth Century Spanish Literature: Later Period (3-0)**  
The "Generation of '36," including Cela, Laforet, Gironella, Casona, Zunzunegui, etc. *Prerequisite:* Spanish 3202.
- 3360 The Regional and Historical Novel in South America (3-0)**  
A study of the famous regional and historical novels of South America, exclusive of Brazil. At least one representative author of each country or region. Special attention to major regional language differences. Outside reports. *Prerequisite:* Spanish 3202.
- 3362 The New World in Spanish Literature (Northern Hemisphere) (3-0)**  
A literary study of diaries, accounts and biographies of the Spanish explorers in the New World: Columbus, *Diario de Navegación*; Cortes' *Cartas de Relación*; Cabeza de Vaca's *Naufragios*; Castañeda's *Jornada de Cibola*, etc. Special attention to the American Southwest. *Prerequisite:* Spanish 3202.
- 3363 The Literary History of Argentina (3-0)**  
The principal movements and writers in Argentine literature. At least four representative works will be read in class. Conducted in Spanish. *Prerequisite:* Spanish 3202.
- 3364 Contemporary Poets of Latin America (3-0)**  
The most significant works of the leading poets of Latin America. Emphasis on the modern period. *Prerequisite:* Spanish 3202.

- 3365 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:* Spanish 3202.
- 3366 The New World in Spanish Literature (Southern Hemisphere) (3-0)**  
A literary study of the diaries, accounts and biographies of the Spanish explorers and *conquistadores* in the New World: Cabeza de Vaca's *Comentarios*; El Inca Garcilaso de la Vega's *Comentarios reales*; Ercilla's *La Araucana*, etc. *Prerequisite:* Spanish 3202.
- 3377 History of Spanish Poetry (3-0)**  
A survey of Spanish poetry to the middle of the twentieth century. *Prerequisite:* Spanish 3202.
- 3400 Language Theory and Analysis (3-0)**  
Seminar in language improvement and Spanish literature and culture. Methods for teaching Spanish on all levels. Practical linguistics; written and oral participation in language improvement; problems of literary analysis, appreciation, criticism and explication with sociological and cultural anthropological factors. *Prerequisite:* Six hours of advanced Spanish.
- 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.
- 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.
- 3467 El ensayo hispanico (3-0)**  
A study of the Spanish and Spanish American essay of the nineteenth and twentieth centuries: Larra, Canivet, 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. *Prerequisite:* Six advanced hours of Spanish.

**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

OLAV E. EIDBO, *Head*

*Professors* EIDBO, THORMODSGAARD; *Associate Professors* BRIGGS, HILLYER;  
*Assistant Professors* CARDON, GIBSON, SWINGLE, THAYER, PAUL, STANLEY;  
*Instructors* CROWLEY, GEYER, KENNESON, KRESS;  
*Part-time Instructors* CAIDRY, HEUSER, EICHER.

### THEORY

#### For Undergraduates

- 2111. 2112 Music Fundamentals, Sight Singing and Dictation (2-1)**  
Functional experiences in the basic fundamentals of music with simple melodic, harmonic and rhythmic instruments; one through four-part sight singing and dictation.
- 3113. 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. Open to all students.
- 1211. 1212 Sight Singing and Dictation (1-1)**  
Continuation of Music Theory 2112. Concurrent registration with 3113-14 recommended. *Prerequisite:* Music Theory 2112, or equivalent background.
- 3213. 3214 Harmony (3-2)**  
Continuation of melodic and harmonic dictation and part writing; harmonic analysis and simple forms; seventh chords; altered chords; keyboard practice. *Prerequisite:* Music 3113-14.

#### 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****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.

**1165 Chamber Music and Ensembles\* (1-1)**

Reading of music and the study of selected works characteristics to the performing group. *Prerequisite:* Preceding course or 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.

**For Undergraduates and Graduates****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.

\*May be repeated for credit.

**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**

**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, plainsongs, spirituals, and carols. Twentieth century trends in hymnology. Uses of intonets, 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 (3-1)**  
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 (3-1)**

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.

**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.

\* May be repeated for credit.



- 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:* Junior 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.
- 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 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, and approval of the Music Faculty Teacher Education Committee.

#### 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**

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 Head of the department.

*Only Secondary Level courses numbered 2300 and above may be taken for graduate credit.*

**Ensembles**—Band, Chorale, Orchestra, Chorus, Lab Dance Band, a fully equipped symphony orchestra, a concert and marching band, a laboratory band, small chamber groups and two large choirs 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 and oratorios. Home concerts and concert tours are a part of the program. Consent of instructor is required for admission.

**1143 Band, Choir, Orchestra, Lab Dance Band\* (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. *Prerequisite:* Permission of instructor.

**1102 Goldiggers\* (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 minor or elective. Open to all students. These courses will be designated as Voice 2171, Piano 2171, etc.

**2171, 2172, 2271, 2272, 2371, 2372 (\$4) (2-1)**

*Prerequisite:* Preceding course or placement. (Exception: only \$2.00 for Class Voice.)

**3190 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.

**2373, 2374 Piano Sight Reading Class (\$2) (2-0)**

Emphasis on actual playing experience and sight reading at the piano. *Prerequisite:* Junior standing and permission of instructor.

*\*May be repeated for credit.*

**2493 Pedagogy of Voice (2-0)**

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.

## BALLET

**For Undergraduates****2141, 2142 Ballet (3-0)**

Basic Ballet techniques combining the methods of the Russian, Cecchetti and French Schools. Public performance opportunities with The University Civic Ballet and The University Community Opera.

**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 Head of department.

**3241, 3242 Intermediate Ballet (4½-0)**

Continuation of 2142, with more advanced work in the creative aspects of dance movements. Four and one-half hours per week. *Prerequisite:* Ballet 2142 or permission of Head of department. (Formerly 2241, 2242.)

**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 Head of the Department.

## INDIVIDUAL INSTRUCTION

Junior and senior courses on the secondary level may be used for undergraduate and graduate credit, may be repeated for credit on the undergraduate level. Students are expected to study on campus with members of the University music faculty.

**For Undergraduates and Graduates**

Only *junior* and *senior* courses with "9" as the third digit are acceptable towards a graduate degree.

## SECONDARY LEVEL

**3491, 3492 Selected Problems in Applied Music (\$50) (Indiv.)**

Designed to meet the needs of students in specific areas omitted in previous studies. Required of students who have not taken courses on their major instruments at The University of Texas at El Paso within three years of graduation. *Prerequisite:* Applied Music 2292, senior standing, or equivalent, in music, and experience, and permission of instructor.

## PIANO, ORGAN

Courses designated as Piano 2181-82, Piano 2281-82, Organ 2181-82, etc.

**PRIMARY:** For non-majors 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.

\*May be repeated for credit.

*School of Liberal Arts*

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- 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.

SECONDARY: For majors in Theory, Music Education, and 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.

FOR MAJORS IN APPLIED MUSIC

- 4191, 92, 4291, 92 (\$45)**  
Two thirty-minute lessons and nine practice hours per week. Recital participation. *Prerequisite:* Preceding course or placement.
- 4391, 92, 4491, 92 (\$50)**  
Two thirty-minute lessons and nine practice hours per week. Recital participation. *Prerequisite:* Preceding course or placement.

ORCHESTRAL AND BAND INSTRUMENTS

(Flute, Oboe, Clarinet, Bassoon, Saxophone, Violin, Viola, Violoncello, String Bass, Cornet or Trumpet, French Horn, Trombone or Baritone, Tuba, Percussion, Harp.)

PRIMARY: For non-majors and for students needing preparatory study; Undergraduate credit only.

- 2181, 82, 2281, 82, 2381, 82, 2481, 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.

SECONDARY: For majors in Theory, Music Education, and 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.

## FOR MAJORS IN APPLIED MUSIC

**4191, 92, 4291, 92 (\$45)**

Two thirty-minute lessons and fifteen practice hours per week. *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.

## VOICE

During the first two years of vocal study there is considerable emphasis on voice building, using methods of the old Italian school. Varying amounts of song literature are studied depending upon the progress of the individual. Voice building is continued throughout the junior and senior years, although increasing emphasis is placed upon coaching.

At the end of the senior year the student should be able to sing in three foreign languages, including in his repertoire four operatic arias, four oratorio arias, twenty classics and twenty standard modern songs.

**PRIMARY:** For non-majors and for students needing preparatory study; Undergraduate credit only.

These courses are designed for all students interested in singing and for those who require preparation for the college level course in voice. Students with vocal and hearing difficulties, including "monotones," are urged to take these courses. All students studying primary or secondary voice are expected to participate in one of the two university choirs.

**2181, 82, 2281, 82, 2381, 82, 2481, 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

**SECONDARY:** For majors in Theory, Music Education, and 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.

## PHILOSOPHY

J. H. HADDOX, *Head*

H. Y. Benedict Professor ROMANELL;

Professor HADDOX; Assistant Professors SPRINGER, HALL.

**B.A. Degree** — Specific courses required for the Bachelor of Arts in Philosophy are Philosophy 3203, 3204, 3205, 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.

**3203 Introduction to Philosophy (3-0)**

An introduction to the basic problems of philosophy, with readings from primary sources.

**3204 Ancient and Medieval Philosophy (3-0)**

Philosophic thought from the Greeks to the Scholastics.

**3205 Modern Philosophy (3-0)**

Philosophic thought from Descartes through Kant.

**3206 Ethics (3-0)**

A discussion of moral principles.

**3207 Philosophy of Civilization (3-0)**

A philosophical analysis of the various phases of human culture.

**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 Mexican-American Thought**

A comparative philosophical analysis of value systems developed by thinkers in Mexico and the United States and the influence of both of these on the Mexican-American search for identity and a distinct set of values.

*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.

**3332 Contemporary Philosophy (3-0)**

A study of recent philosophical thought.

**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 History of Philosophy — Seminar (3-0)**  
The life and work of one or more of the great philosophers will be the subject of study. May be repeated when the course content varies. *Prerequisite:* Philosophy 3204 and 3205 or the equivalent as determined by the instructor.
- 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.

## POLITICAL SCIENCE

JOSEPH B. GRAVES, JR., *Head*

*Professors* BEASLEY, COOK, MYRES, RAY, STRAUS;

*Associate Professors* GRAVES, LEONARD, NEIGHBOR, PETERSON;

*Assistant Professors* BATH, GROSSER, HOVEL, KRUSZEWSKI; *Instructor* BETHUNE

**B.A. Degree** — A major in political science consists of 36 semester hours of work. Introductory courses 3110 and 3111 are prerequisites to all other political science courses. Majors are advised to complete the following core courses during their sophomore year:

1. Comparative Political Systems — Political Science 3224
2. International Relations — Political Science 3231
3. Introduction to Public Administration — Political Science 3250

Junior standing is required for the remaining three core courses:

1. The Party System — Political Science 3325
2. Constitutional Law I — Political Science 3328
3. Western Political Heritage — Political Science 3334

In addition to completing the above-mentioned courses, majors are required to take at least twelve (12) additional hours of advanced work at the 3300 and 3400 level, distributed among the following fields within the department:

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.

A minor will consist of at least eighteen (18) hours, six (6) of which must be at the advanced level and with junior standing.

### For Undergraduates

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

Political Science 3110 and Political Science 311 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 State and Local Government (3-0)**

Organization, powers, functions, and business methods of state and local administrative agencies; problems of integration, centralization, budget and fiscal control and plans for reorganization; and intergovernmental cooperation among federal and local agencies. Special reference to Texas.



- 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

*Prerequisite:* Political Science 3110 and 3111 plus Political Science 3224, Political Science 3231 and Political Science 3250 for majors. Political Science 3110 and Political Science 3111 and junior standing for non-majors.

#### AMERICAN POLITICAL PROCESSES

- 3320 Ethnic Politics in the United States (3-0)**  
An analysis of the nature, role, techniques and objectives of ethnic groups in the American political system. The course places special emphasis on the role of the Mexican-American and Afro-American in the contemporary political scene.
- 3322 Urban Government and Administration (3-0)**  
The organization, politics, problems, and administration of urban governments in the United States. May be counted as public administration.
- 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.
- 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**

**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)

**3510 Seminar in American Government**

Research, writing, and discussion.

**3520 Seminar in American Government and the Military**

Research, writing, and discussion.

**3523 Seminar in Communist Politics**

Research, writing, and discussion.

**3524 Seminar in Comparative Political Cultures**

Research, writing, and discussion.

**3525 Seminar in Latin American Studies**

Research, writing, and discussion.

**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**

## PSYCHOLOGY

PHILIP HIMELSTEIN, *Head*

*Professors* COLEMAN, HIMELSTEIN;

*Associate Professors* BARRIENTOS, BOSWORTH, GOGGIN, MILLER, WHITWORTH;

*Assistant Professors* DEVINE, LUCKER, WILLIAMS;

*Adjutant Professors* CHESMORE, FARRER; *Part-time Instructors* BIRD, RUSSELL.

*Degree Requirements:*

The Psychology Department offers two programs leading to the Bachelor of Arts Degree:

1. **Pre-Professional**. B.A. Degree for students who intend to get advanced degrees. Required courses are:
  - a) Psychology 3101, 3103, 3221, 3222, 3310, 3417.
  - b) Sciences: 12 hours in Chemistry; 12 hours in Physics; or Biology 4110, Zoology 4103 and either Biology 4202-4203 or Zoology 5201.
  - c) Mathematics 4110, 4111.
  - d) Language: German, French, or Russian.
  - e) Minor: Select after consultation with advisor. Students without firm plans for specialization should minor in Biological Sciences, Mathematics, Chemistry, or Physics.

*Additional courses especially recommended are:*

- a) Psychology 3202, 3206, 3212, 3309, 3330, 3411.
  - b) Chemistry 3330, 3331, or Physics 4339, or Zoology 5201.
  - c) Mathematics 3324, 3331, 3429.
2. **Liberal Arts**. B.A. Degree for students who do NOT intend to get advanced degrees. Required courses are:  
Psychology 3101, 3103, 3221, or 3222; Chemistry 3103-04, or 4103-04; or Physics 4103-04; or Biology 4110, 4202, or Zoology 4103, or Biology 3111-3112.

**For Undergraduate Credit Only**

*General prerequisite:* Psychology 3101 is prerequisite for all psychology courses.  
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 (\$2) (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.
- 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 Mexican American**  
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) (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) (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.
- 3305 Personnel Psychology (3-0)**  
A survey of principles and methods used for selection and placement in personnel management and industry.
- 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.
- 3308 Principles of Testing and Counseling (3-0)**  
The basic principles underlying testing and counseling.
- 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.
- 3316 Psychoanalytic Psychology (3-0)**  
A study of the theoretical and experimental foundations of psychoanalysis. *Prerequisite:* Psychology 3302 or permission of the instructor.
- 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 Problem Solving (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.
- 3350 Behavior Genetics (3-0)**  
A study of the role of genetics in variations in behavior. *Prerequisite:* Biology 3304 or permission of instructor.

#### For Undergraduates and Graduates

*General prerequisite:* Six advanced hours in psychology.

- 3401 Psychological Testing (\$3) (2-2)**  
Introduction to and training in the administration, scoring, and interpretation of psychological tests.
- 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.
- 3421 Learning Theory (3-0)**  
A consideration of some of the major issues on which learning theories divide; critical review of some of the important relevant experiments. *Prerequisite:* Psychology 3310.
- 3441 Motivation and Emotion (3-0)**  
A critical evaluation of present theories as to the causes of behavior. *Prerequisite:* Psychology 3221, 3310.
- 4442 Comparative Psychology (4-2)**  
A study of behavior at different phylogenetic levels with emphasis on recent contributions from ethologists and psychologists. *Prerequisite:* Psychology 3221.
- 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.
- 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 and 3417.

**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)**  
Intensive study and analysis of systematic conceptions of the learning process. *Prerequisite:* Psychology 3310 or equivalent.
- 3521 Projective Techniques (2-2)**  
Introduces the student to projective theory and acquaints him with the more widely-used projective instruments, their uses and limitations. Two hours lecture and two hours laboratory.
- 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 (\$5) (2-2)**  
*Supervised practice in the administration, scoring, and interpretation of individual tests of intelligence. Permission of instructor required.*
- 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 Practicum (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, *Head*

*Professors* CARTER, KRAENZEL, ROEBUCK, STEGLICH, STODDARD;  
*Associate Professors* GOODMAN, HIATT; *Assistant Professors* GERALD, MCNAMARA,  
TIMBERS; *Instructors* BROWN, CASTILLO, HAMBY, HOUSER, MACDONALD, MORROW.

**B.A. Degree** — Specific requirements for a Sociology major are thirty semester hours of Sociology, eighteen (18) of which must be at the 3300 and 3400 level, including the following required courses: 3101, 3102, 3355, and 3465.

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: 3275, 3375, 3376, and 3475.

### SOCIOLOGY

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

*Unless otherwise noted, Sociology 3101 is a required prerequisite for all other courses in Sociology. Exceptions to this must receive permission from Head of Department.*

#### For Undergraduates

- 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 strongly recommended.
- 3212 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.
- 3214 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.
- 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.
- 3246 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.
- 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.

**For Undergraduates and Graduates**

- 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.
- 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.
- 3325 Social Class and Stratification (3-0)**  
Social class differences in static and dynamic societies; theories of social class and criteria of measurement; selected community studies and social mobility patterns in U. S. and foreign societies.
- 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.
- 3347 Demography (3-0)**  
Statistical analysis of the population of the world, the U. S. and the southwest. Study of fertility, mortality, and migration patterns.
- 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.
- 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.
- 3358 Spanish-Speaking Groups in the Southwest (3-0)**  
Culture, social structure, and change among Spanish-speaking groups in relationship to Anglo-American society.

**3359 The Mexican American and Social Institutions (3-0)**  
Analysis of Mexican American experience in selected institutions such as schools, churches, governmental structures, military and mass media.

**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.

**3375 Social Work: A Social Welfare Profession (3-0)**  
A study of social work as a profession — its professional attributes, principles, goals, values and methods. *Prerequisite:* Sociology 3275.

**3376 Methods of Social Work Intervention (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:* Sociology 3275.

**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 Head.

**3442 Sociology of Deviants (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.

**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.

**3475 Field Experience in Social Work (2-3)**  
A laboratory learning experience in selected social welfare agencies with weekly seminars. Students are assigned to specific agencies for the semester. *Prerequisite:* Sociology 3275 and 3375.

### FOR GRADUATE STUDENTS ONLY

*Prerequisite:* Graduate standing and consent of Head of Department

**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 Nature of Man (3-0)**  
An introduction to the evolution of the 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.
- 3102 **Social Anthropology (3-0)**  
An introduction to the evolution of the human behavioral systems with particular attention to the social and cultural, or ideational, components. The variety of types of societies and ideologies are discussed together with the ecological situations to which they are adapted.
- 3105 **Culture of Mexican Americans (3-0)**  
An examination of the society, ideology, and technology of the Mexican American culture. The cultural and biological contributions of the diverse ethnic groups and racial types that have amalgamated to form the modern Mexican American will receive major attention.
- 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.
- 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.
- 3212 **Indians of North America (3-0)**  
A survey to familiarize the student with the social, cultural, and technological adaptations made by native peoples inhabiting the varied environmental zones from Panama to Canada as they competed with other Indians and early European immigrants for the necessities for maintenance of their ways of life. *Prerequisite:* Anthropology 3101 and 3102.
- 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 and 3102 or permission of instructor.
- 3220 **Introduction to Linguistics (3-0)**  
(Same as English 3220). *Prerequisite:* Anthropology 3101 and 3102 or permission of instructor.

- 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 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 3101 and 3102.
- 3316 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 the Eskimo, Hottentot, New Guinea Enga, Iroquois, Kongo, Zulu, and Trobrianders. *Prerequisite:* Anthropology 3101 and 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. *Prerequisite:* Permission of the instructor.
- 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 head 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.

## GEOGRAPHY

- 3210 Cultural Geography (3-0)**  
A study of other nations and other people, to better appreciate and understand their way of life. Racial and cultural backgrounds, political, social and economic developments and geographic physical factors are considered, initially by world regional patterns, followed by variations within political subdivisions. *Prerequisite:* Six semester hours of Sociology or sophomore standing. Not counted as laboratory science.
- 3312 Geography of Latin America (3-0)**  
A systematic survey of the geographic characteristics of Latin America. The interrelations between social structure, the culture and the geography of these countries will be analyzed. *Prerequisite:* Junior standing.





# School of Science

LEWIS F. HATCH, *Dean*

HAROLD E. ALEXANDER, *Assistant Dean*



## SCHOOL OF SCIENCE

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### BIOLOGICAL SCIENCES

JAMES B. REEVES, *Head*

*Professors* BERKMAN (emeritus), REEVES, WEBB, ROBERTSTAD;  
*Associate Professors* CHRAPLIWY, DUKE, EKLUND, METCALF, WILLIAMS, HARRIS,  
HUNTER; *Assistant Professors* MANNING, TULLEY, FREEMAN, ELLZEY, WORTHINGTON;  
*Lecturer* RECTOR; *Teaching Assistants* ROUCHE, KOSCHMANN, STERN,  
COLEMAN, KINNIBURGH, PATTERSON.

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-nine 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 Botany, Microbiology, or Zoology. Also, a student may minor in any of these fields providing the major and minor are not in the same area.

All Biological Science majors are required to have at least eight semester hours of Chemistry. For the B.A. degree, six hours is acceptable (Chemistry 3101-02).

Biology 3304 and 1415 are required of all Biological Science majors for graduation.

Anthropology may be used as a minor subject for the B.A. degree with a major in Biological Sciences.

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

### BIOLOGY

#### For Undergraduates

#### 3111-12 Elements of Biology (\$4-\$4) (2-2)

Fundamentals of the biology of organisms with special reference to biological populations, communities, conservation and the diversity of life. Man and his biological environment stressed. For Liberal Arts students. May not be used by Biological Science majors or minors to satisfy the requirements for the B.A. or B.S. degree.

#### 4101-02 Anatomy and Physiology (\$4-\$4) [For Nurses Only] (3-2)

Study of a typical animal cell: mitosis and cell division; meiosis; survey of mammalian histology, the human skeleton, muscles of the body, circulatory and nervous systems, physiology.

#### 4110 General Biology (\$4) (3-3)

Principles of cell and energy relationships in biotic systems, self-perpetuation, classification, and relationships of the organism to space, time and environment.

#### 4202 Human Anatomy (\$4) (3-2)

Survey of the anatomy of the human body with emphasis on the skeletal and muscular systems. *Prerequisite:* Zoology 4103. This course may not be counted for credit in addition to Zoology 5201.

#### 4203 Introduction to Human Physiology (\$4) (3-2)

Body functions with emphasis at the organismal level. *Prerequisite:* Zoology 4103.



**For Undergraduates and Graduates**

- 4301 Physiology of exercise (\$4) (3-2)** [For P.E. and Education majors only] The physiology of the nervous, muscular, skeletal and respiratory systems of man in relation to work and exercise. *Prerequisite:* Biology 4203 or Zoology 5201. May not be used by Biological Science majors to satisfy the requirements for the B.A. or B.S. degrees.
- 3304 Genetics (3-0)** Principles of heredity in their application to animals, plants, and mankind. *Prerequisite:* Zoology 4103 or Botany 4103 and Junior standing. Required of all biological science majors.
- 3314 Evolutionary Theory (3-0)** History of evolutionary thought; critical examination of the evidence for evolution with emphasis on genetic, morphological, ecological and zoogeographical concepts as related to the process of evolution. *Prerequisite:* Twelve hours of biological sciences and Junior standing.
- 6465 Field Biology (Summer Field Course) (Fee varies according to where course is based)** Study and collection of animals and plants. *Prerequisite:* Senior standing, 12 hours of advanced Biological Sciences and consent of instructor.
- 4327 Cellular Biology (\$6) (3-3)** A study of the structure and function of cells. *Prerequisite:* Twelve semester hours of biological science and eight hours of chemistry.
- 4401 Microtechnique (\$6) (2-4)** Principles of fixing and staining of cells and tissues. *Prerequisite:* Senior standing and permission of the Head of the department.
- 3428 History of Biology (3-0)** The history of biology from earliest times to the present. *Prerequisite:* 12 hours of biology and senior standing.
- 1415 Selected Topics in the Biological Sciences — Seminar (2-0)** *Prerequisite:* Twelve hours of advanced biological sciences. Required of all biological science majors.
- 2498-6498 Special Problems (\$8)** 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:* Permission of the head of the department and consent of the instructor.

**BOTANY**

**For Undergraduates**

- 4103 General Botany (\$4) (3-3)** General principles of plant science emphasizing the vascular plants. *Prerequisite:* Biology 4110 or equivalent.
- 3210 Comparative Plant Morphology (\$4) (2-3)** The life histories and phylogenetic relationships of vascular and non-vascular plants. *Prerequisite:* Botany 4103 or equivalent.
- 3211 General Plant Taxonomy (\$4) (2-3)** Familiar characteristics and relationships primarily within the flowering plants. Also collection, preservation, and identification of plants. *Prerequisite:* Botany 4103 and 3210.

**For Undergraduates and Graduates**

- 3301 Plant Ecology (\$4) (2-3)**  
The adaptation of plants to environmental growth conditions. Emphasis is on the origin, development, and stabilization of plant communities. *Prerequisite:* Botany 3210.
- 3304 Economic Botany (3-0)**  
Survey of the plants with the greatest economic importance to man. Study of products from the plant cell wall, cell exudates and extractions. *Prerequisite:* Botany 4103 and permission of Head of Department.
- 3320 Plant Anatomy (\$4) (2-3)**  
A comprehensive treatment of the development, function and evolutionary significance of the internal structure of plants. *Prerequisite:* Botany 3210.
- 4313 Plant Physiology (\$6) (3-2)**  
A study of the processes of nutrition, growth and metabolism. *Prerequisite:* Botany 4103 and Chemistry 4103-04.
- 3323 Mycology (\$4) (3-3)**  
The morphology, taxonomy, and physiology of the fungi. Does not include those fungi of medical importance. *Prerequisite:* Botany 4103 and junior standing.
- 3414 Advanced Plant Taxonomy (\$4) (2-3)**  
The systematic identification, classification and phylogenetic study of selected plant families. *Prerequisite:* Botany 3211 and Senior standing.
- 3415 Plant Geography (\$4) (3-0)**  
Geographical distribution of the major plant taxa of the world. Principles and factors governing plant distribution. *Prerequisite:* 10 hours of Botany.

**MICROBIOLOGY**

- 4201 Microbiology (\$4) [For Nurses Only] (3-3)**  
Survey of microbes with emphasis on pathogens, bacteria and protozoans; culture technique; staining technique; histology of the blood and typing of blood groups. *Prerequisite:* Chemistry 3101 and Biology 4101.

**For Undergraduates**

- 4202 General Microbiology (\$6) (3-3)**  
Principles of microbiology; application of pure culture techniques employing non-pathogenic forms; staining techniques, preparation of media; applications of microbiology. *Prerequisite:* Biology 4110, Botany 4103 or Zoology 4103 and Sophomore standing.
- 3226 Microbial parasite-host relationships (3-0)**  
The relationship of the microbial parasite and its host. *Prerequisite:* Microbiology 4202.

**For Undergraduates and Graduates**

- 4302 Pathogenic Microbiology (\$6) (3-3)**  
Survey of pathogenic bacteria with emphasis on their pathogenicity, and application of principles in isolation; introduction to immunology. *Prerequisite:* Microbiology 4202; for juniors and seniors, the equivalent of Microbiology 4202 as determined by the Instructor and the Head of the Department.
- 3333 Microbial Physiology (3-0)**  
Principles of microbial activity; microbial anatomy, growth, nutrition and metabolism. *Prerequisite:* Microbiology 4202 and eight hours of Chemistry. Chemistry 4224-25 concurrently.

- 3334 Industrial Microbiology (\$6) (2-3)**  
Principles of antibiotic production, microbial fermentations, microbiology of water and sewage, production of biological agents. *Prerequisite:* Microbiology 4202 and 3333.
- 3424 Advanced General Microbiology (\$6) (2-3)**  
An intensive study of the genera of bacteria, principles of dilutions, enzymatic assay, and an introduction to instrumental analysis. *Prerequisite:* Microbiology 4202 and 3333 and six additional semester hours of Microbiology.
- 4425 General Virology (\$6) (3-3)**  
A morphological, physiological, and biochemical study of animal, plant, and bacterial viruses. *Prerequisite:* Microbiology 3333 and 4460.
- 4460 Immunology (\$7) (3-4)**  
Principles of the immune reaction, nature of antigens and antibodies, antigen-antibody reactions, allergic phenomena, antiviral immunity. *Prerequisite:* Microbiology 4302, and Chemistry 4224.
- 4461 Medical Mycology (\$6) (3-3)**  
A study of the fungi of medical importance. *Prerequisite:* Microbiology 4302.

**ZOOLOGY**

**For Undergraduates**

- 4103 General Zoology (\$4) (3-3)**  
A survey of the kinds of animals, their classification, phylogenetic relationships, anatomy and ecology. *Prerequisite:* Biology 4110 or the equivalent.
- 5201 Comparative Vertebrate Anatomy (\$7) (3-5)**  
Classification and comparative anatomy of vertebrates, including function, ontogeny and phylogeny of their organs and organ systems. Dissection of a cyclostome, selachian, and a mammal. *Prerequisite:* Zoology 4103 with a grade of at least a "C" and Sophomore standing.
- 3204 Ornithology (\$4) (2-3)**  
A study of the morphology, taxonomy and life histories of birds. *Prerequisite:* Zoology 4103 and sophomore standing.

**For Undergraduates and Graduates**

- 3301 Vertebrate Embryology (\$4) (2-3)**  
Comparative embryology with special emphasis on avian and mammalian development. *Prerequisite:* Zoology 5201 with a grade of at least a "C" and Junior standing.
- 3302 Vertebrate Histology (\$6) (2-3)**  
Structure of vertebrate tissues and organs. *Prerequisite:* Zoology 4103 and junior standing.
- 3303 Animal Ecology (\$4) (2-3)**  
Fundamentals of the relations of animals to the physical and biological environment; adaptation of structure and functions, natural selection, populations and the factors that control them, associations and specialized relations, organization and interrelationships of plant-animal communities. *Prerequisite:* Zoology 4103 and six additional hours of biological science.
- 4304 Vertebrate Physiology (\$7) (3-3)**  
A review of the principles of the functions of vertebrate systems with emphasis on movement and excitation, synaptic transmission and nerve reflex action, cardio-physiology, respiration, renal function, endocrinology, and metabolism. *Prerequisite:* Biology 4110, Zoology 4103, Chemistry 4103-04.
- 3305 Parasitology (\$4) (2-3)**  
A survey of the parasitic Protozoa, Platyhelminthes, Aschelminthes and Arthropoda; their morphology, physiology and life cycles. *Prerequisite:* Zoology 4103 and six additional hours of biological sciences.

*School of Science*

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- 4306 Vertebrate Natural History (\$4) (3-2)**  
The evolution, taxonomy, ecology, and zoogeography of vertebrates with a consideration of their morphology, physiology, and behavior pertinent for adaptation to various habitats. *Prerequisite:* Zoology 5201.
- 3307 Entomology (\$4) (2-3)**  
A study of the morphology, taxonomy and life histories of insects. *Prerequisite:* Eight semester hours of Zoology and junior standing.
- 4464 Invertebrate Zoology (\$4) (3-3)**  
A study of the morphology, taxonomy and life histories of invertebrates. *Prerequisite:* 12 semester hours of biological science and Senior standing.
- 3430 Zoogeography (3-0)**  
A study of the geographical distribution of animals. Past geologic and ecologic factors accounting for present distributional patterns are emphasized. *Prerequisite:* Twelve hours of biological sciences and Senior standing.
- 4463 Protozoology (\$4) (3-3)**  
The morphology, taxonomy and physiology of the non-parasitic protozoa. *Prerequisite:* Twelve semester hours of biology and senior standing. May be counted as four semester hours toward zoology or microbiology option.

### 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. Not more than two hours credit in Biology 1516 (Graduate Seminar) will be counted toward the 30 semester hour requirement. Biology 3501 (Selected Advanced Topics in Zoology) and Biology 3502 (Problems in the Biological Sciences) may be taken for not more than a total of six hours credit toward the 30 semester hour requirement. A six hour minor may be accepted by the department. A thesis describing original work is required and must be defended orally before receiving the degree.

Biology majors must also show the following or their equivalents (as judged by the Graduate Advisory Committee): either (1) one year of credit in freshman level Spanish, French, German, or Russian, or (2) a minimum of three semester hours in either Math 3324 (Computer Programming and Computer Principles) or in Statistics.

*Prerequisite:* Twelve advanced hours of Biological Sciences and a Bachelor's Degree.

- 3501 Selected Advanced Topics in the Biological Sciences (3-0)**  
Topics vary with student background and instructor.
- 3502 Problems in the Biological Sciences (\$8)**  
Research, writing and discussion in the Biological Sciences.
- 3503 Desert Ecology (3-3)**  
An advanced study of the relation of plants and animals to the physical and biological environments.
- 3504 Cytogenetics (3-3)**  
A correlation of plant and animal cytology and genetics.

- 3505 Herpetology (3-3)**  
A study of the morphology, taxonomy and life histories of reptiles & amphibians.
- 3506 Mammalogy (3-3)**  
A study of the morphology, taxonomy and life histories of mammals.
- 3507 Biology of the Pleistocene (3-0)**  
A study of the organisms of the Pleistocene.
- 3508 Endocrinology (\$8) (3-3)**  
A study of the structure and function of the endocrine glands of mammals and invertebrates.
- 3509 Microbial Genetics (3-0)**  
A study of the genetics of microorganisms.
- 3510 Biochemical Genetics (3-0)**  
Mechanisms of heredity at the molecular level.
- 3511 Animal Behavior (3-0)**  
A study of the behavior of animals.
- 3512 Recent Advances in Microbiology (3-0)**
- 1516 Seminar (1-0)**  
Two semesters of seminar are required of all graduate students.
- 3598-99 Thesis**

## CHEMISTRY

JAMES W. WHALEN, *Head*

*Professors* ALEXANDER, HANCOCK, HATCH, LEVITT, WHALEN;

*Associate Professors* DAVIS, CABANESS, LLOYD, PARKANYI, RIVERA;

*Assistant Professors* AMADOR, ELLZEY, PRATER, SCRUGGS; *Lecturer*, DECKER.

**B.S. Degree** — The minimum course requirements in Chemistry for the Bachelor of Science Degree are Chemistry 4103-04, 5213, 3262, 4321-22, 4360-61, 4450, 3465, two additional advanced courses in Chemistry one of which must be a laboratory course and German 4101-02. 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 4103-04, 5213, 3262, 4321-22, and 4360-61.

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 4103.

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 4103 and 4104. If he scores 80 or above, he will be given the corresponding grade and credit for Chemistry 4103 and 4104.

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 (\$4) (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.

**4103-04 General Chemistry (\$6-\$7) (3-4)**

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 sciences.

**5213 Analytical Chemistry (\$8) (2-9)**

Analytical chemical practices, separations, identifications and quantitative measurements. *Prerequisite:* Chemistry 4103-04.

**4224-25 Organic Chemistry (\$5-\$5) (3-3)**

[Formerly 3221-22]

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 4321-22. *Prerequisite:* Chemistry 4103-04.

**2224-25 Organic Chemistry (3-0)**

[Formerly 2221-22]

The same as Chemistry 4224-25 but without the laboratory. *Prerequisite:* Chemistry 4103-04.

**3262 Structure of Matter (3-0)**

Introduction to Quantum Theory; atomic and molecular structure; atomic and molecular spectra; chemical bonding. *Prerequisite:* Physics 4216-1216 concurrently.

## For Undergraduates and Graduates

- 4321-22 Organic Chemistry (\$6-\$6) (3-5)** [Formerly 4221-4322]  
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. *Prerequisite:* Chemistry 3262. May not be counted in addition to 4224-25 or 2224-25.
- 3428 Advanced Organic Chemistry (3-0)**  
The application of conformational analysis, stereochemistry, kinetics, and isotopic labeling to the study of reaction mechanisms. Course may be repeated for credit when topics vary. *Prerequisite:* Chemistry 4322, Chemistry 4361.
- 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 4225 or 4322.
- 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 4322, Chemistry 4361.
- 3333 Petroleum Chemistry and Petrochemicals (3-0)**  
The chemical nature of petroleum and the chemistry of petroleum's conversion into refinery products. The conversion of hydrocarbons into petrochemicals. *Prerequisite:* Chemistry 4322.
- 4450 Instrumental Methods of Analytical Chemistry (\$6) (2-6)**  
A study of the more important optical and electrical methods of chemical analysis. *Prerequisite:* Chemistry 4361.
- 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 4361.
- 4360-61 Physical Chemistry (\$8-\$8) (3-4)**  
Properties of substances in gaseous, liquid and solid states; solutions, thermodynamics, kinetics and other advanced topics. *Prerequisites:* Chemistry 4103-04, Mathematics 4212 and Physics 4216.
- 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 4360; corequisite: Chemistry 4361.
- 3468 Analytical Organic Chemistry (\$6) (1-6)**  
Identification techniques and functional group analysis of organic compounds. *Prerequisite:* Chemistry 4322, Chemistry 4450.
- 4470 Radiochemistry (\$8) (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 4212; Physics 4216-1216; Chemistry 4361.
- 2476 Introduction to Research (\$8)**  
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 5500 level. Credits must include at least the first 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 a 6-hour minor from the fields of Biology, Geology, Mathematics, Physics or approved Engineering. At least 3 hours of this minor must be completed in residence. Programs of specialization in clinical chemistry and chemical physics may be elected with the permission of the graduate adviser. Such programs may include within the required 30 hours of credits in excess of 6 hours but not more than 12 hours in the related fields of biology (for clinical chemistry) and physics-mathematics (for chemical physics). 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 4322.
- 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)**  
Schrödinger 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 Thymetical 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, *Head**Professors* McANULTY, QUINN (Emeritus), HILLS, KLEMENT, STRAIN;*Associate Professors* HOFFER, LEMONE, LOVEJOY, SHANNON;*Assistant Professor* SCHMIDT; *Instructor* JACKSON.

## GEOLOGY

**B.S. Degree** — Specific course requirements for the geology major are Geology 4101-02, 4216-17, 4218-19, 3322, 3323, 3327, 6465, and six additional advanced hours in geology; Chemistry 4103-04; Physics 4115, 4216 and 1216 or 4217 (Paleontology majors may substitute biological science for physics); Mathematics 4110, 4111 and 4212. Mechanical Engineering 3103; and English 3269 or Mechanical Engineering 3201.

**B.A. Degree** — Specific course requirements for the geology major are Geology 4101-02, 4216-17, 4218-19, 3322, 3323, and 3327; Chemistry 4103-04; Physics 4115, 4216 and 1216 or 4217; Mathematics 4110, 4111; Mechanical Engineering 3103; and English 3269 or Mechanical Engineering 3201.

Students who desire to major in the geological sciences have a choice of seven routes of study, one leading to the Bachelor of Arts degree and six leading to the Bachelor of Science degree. The routes leading to the Bachelor of Science degree include (1) general geology, (2) engineering geology, (3) exploration geophysics, (4) petroleum geology, (5) economic geology, and (6) paleontology. Each plan except the one for *general geology* includes at least one appropriate minor. A minor must be selected for *general geology* from one of the following fields: mathematics, chemistry, physics, civil or metallurgical engineering. The Bachelor of Arts degree route permits minors in several other fields.

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 detailed information on the requirements for this degree.

## For Undergraduates

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

**3103 Principles of Earth Science (\$5) (2-2)**

Study of the earth as a planet: the physical processes operating in the atmosphere, hydrosphere, and lithosphere, the evaluation of these processes, and the study of earth history as interpreted from and exhibited by plants, animals, minerals and rocks. A one-day field trip is required. For the liberal arts student.

**3104 Principles of Earth Science (\$5) (2-2)**

A continuation of Geology 3103. A one-day field trip is required. *Prerequisite:* Geology 3103 or permission.

**4101-02 Physical and Historical Geology (\$5-\$5) (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 or 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 Sciences) (\$5) 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. [Formerly 4301]

School of Science

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- 2215 Mineralogy for Metallurgists (\$2) 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 4103-4104.
- 4216 Mineralogy (\$4) Fall Semester (3-3)**  
Elementary study of crystallography, crystal chemistry, classification and physical properties of minerals, and identification of the common silicate minerals. *Prerequisite:* Geology 4101, Chemistry 4103, Math 4110.
- 4217 Petrology (\$4) Spring Semester (3-3)**  
Hand specimen study and classification of igneous, metamorphic, and sedimentary rocks. *Prerequisite:* Geology 4216.
- 4218 Invertebrate Paleontology (\$4) Fall Semester (3-3)**  
A study of the morphology and classification of the invertebrates, and their development and geological significance. The course includes an introduction to paleoecology and stratigraphic paleontology. *Prerequisite:* Geology 4101-02, or 3205.
- 4219 Invertebrate Paleontology (\$4) Spring Semester (3-3)**  
A continuation of Geology 4218.
- 3305 Rocks and Minerals (for teachers of Earth Science) (\$2) (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)**  
Introduction to submarine geology, physical and chemical oceanography, marine organisms, marine resources, shore processes, and methods of marine technology. Three hours lecture per week. *Prerequisite:* Geology 4101; or 3103-04.
- 3320 Paleobotany (\$2) Spring Semester (2-3)**  
A study of the morphology, ecology, classification, development, and geological significance of fossil plants. *Prerequisite:* Geology 4101-02, 4218-19; or Botany 4103 and permission of instructor.
- 3321 Geology for Engineers — Fall Semester (2-3)**  
The principles of physical geology and their practical applications to civil engineering. *Prerequisite:* Chemistry 4103-04, Math 4212, Physics 4115, 1216 and 4216, and permission of instructor.
- 3322 Field Course in Geology (\$25) Fall Semester (12-80)**  
A junior-level field course in which the methods and techniques employed in conducting geologic field studies and in the construction of geologic and structure maps are introduced. Selected areas near the University campus are studied. An intensive short course given two weeks before the beginning of the Fall Semester. *Prerequisite:* Geology 4217; Math 4110 or permission of instructor.
- 3323 Structural Geology (\$2) Spring Semester (2-3)**  
A study of the principles and theories of structural geology. Special attention is given to primary and secondary rock structures important in mining, petroleum, and engineering operations. *Prerequisite:* Geology 3322 and Engineering Graphics 3103.
- 3324 Geochemical Prospecting (\$2) Spring Semester (2-3)**  
The application of geochemistry to the search for commercial mineral deposits. *Prerequisite:* Geology 4217 or permission of instructor.
- 3325 Sedimentation (\$2) 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 (\$4) 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 4216 and/or permission of instructor.
- 3330 Micropaleontology (\$2) Spring Semester, Alternate years (1-6)**  
Morphology, classification, and distribution of foraminifera, ostracods, conodonts, etc. Methods of collection and preparation: *Prerequisite:* Geology 4218-19 and consent of instructor.
- 3359 Mineral Resources (\$5) (2-3)**  
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 (\$5) Fall Semester (2-4)**  
Field observations; 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.
- 3410 Workshop in the Teaching of Earth Science (\$5)**  
**Spring Semester (3-0)** [Formerly 2401]  
An introduction to the literature and materials of the earth sciences, and instruction in the construction and use of models and use of demonstration techniques. *Prerequisite:* Geology 3405 or permission of instructor.

#### For Undergraduates and Graduates

- 3440 Igneous and Metamorphic Petrology (\$4)**  
**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.
- 3450 Advanced Invertebrate Paleontology (\$2)**  
**Fall Semester, Alternate years (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 4218-19, senior standing or permission of instructor.
- 3455 Vertebrate Paleontology (\$2) Fall Semester, Alternate years (2-3)**  
Study of the evolution, geologic 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.
- 3457 Subsurface Geology (\$5) Fall Semester (2-3)**  
Training in the application of specific geologic techniques to the study of rocks and structures beneath the earth's surface, and the use of these techniques in theoretical and applied geology. *Prerequisite:* Geology 3323, 3325, and 3462.
- 3460 Economic Geology [Non-Metallics] (\$2) (2-3)**  
Study of the origin, nature, occurrence, distribution, uses, prospecting and exploration techniques, and economic factors bearing on the exploration of industrial rocks and minerals. *Prerequisite:* Geology 3323 or permission of instructor.
- 3461 Economic Geology [Metallics] (\$2) (2-3)**  
Study of the origin, nature, occurrence, distribution, uses, prospecting and exploration techniques, and economic factors bearing on the exploration of metallic mineral resources. *Prerequisite:* Geology 3323, or permission of instructor.
- 3462 Stratigraphy — Fall 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 4218-19, and/or permission of instructor.

- 3463 Geology Applied to Petroleum (\$5) Spring Semester (2-4)**  
The origin, nature, migration, and accumulation of petroleum, and the economics of commercial deposits of oil and natural gas. *Prerequisite:* Geology 3457 or permission of instructor.
- 3464 The Geology of Groundwater — Spring Semester, Alternate years (3-0)**  
Study of the geology and hydrology of groundwater; occurrences, movement, fluctuations, and production; with emphasis on the groundwater resources of the Southwest. *Prerequisite:* Geology 3323, 3325, or permission of instructor.
- 6465 Field Geology [Summer Field Course]**  
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, 3323, and permission of instructor. Fee varies depending on where the course is based.
- 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 specific problems. No student may receive credit for more than six hours of special problems work. *Prerequisite:* Permission of Head of Department.
- 3467 Advanced Structural Geology — Spring Semester, Alternate years (2-3)**  
Detailed literature and field research on structural geologic problems. *Prerequisite:* Geology 3323 and permission of instructor.
- 3468-69 Senior Thesis**  
Open to senior geology majors who have indicated ability to do research and prepare a professional report on suitable topics. This is a two-semester course and must be taken in sequence. *Prerequisite:* Permission of Head of Department.

#### FOR GRADUATE STUDENTS ONLY

- 1501 Technical Sessions (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.
- 3520 Paleozoic Biostratigraphy — Fall Semester, Alternate years (2-3)**  
Classification, paleogeography, and paleontology of the stratigraphic units within the Paleozoic systems. *Prerequisite:* Geology 4218-19 and consent of instructor.
- 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 4218-19 and consent of instructor.
- 3530 Palynology — Fall Semester, Alternate years (1-6)**  
Study of the applications of fossil spores and pollens to selected problems in geology and botany. Extraction, mounting, and examination of samples from peats, soils, clays, coals, crude oils, shales, sandstones and carbonate rocks and extant plants. *Prerequisite:* Geology 3320 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 rocks 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 Geotectonics — Fall Semester, Alternate years (3-0)**  
 A broad areal, temporal, and topical analysis of major earth structures and geotectonic problems. *Prerequisite:* Geology 3467 and consent of instructor.
- 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.
- 3575 Mining Geology (\$5) Spring Semester, Alternate years (2-3)**  
 Application of geologic principles to prospecting, exploration, and exploitation of mineral resources. Mapping and sampling methods, exploration techniques, tonnage and grade calculations, economic evaluation, and preparation of reports. *Prerequisite:* Graduate standing and consent of instructor.
- 3580 X-Ray Mineralogy — Spring 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 standing and consent of instructor.
- 2590 Seminar in Geology (2-0)**  
 Seminar sections (non-concurrently) in paleontology and stratigraphy; mineralogy, petrology, and geochemistry; structural geology and geomorphology; and economic geology. May be repeated for credit. *Prerequisite:* Graduate standing and consent of staff.
- 3595 Petrology of Carbonate Rocks — Fall Semester (2-4)**  
 Description and classification of carbonate rocks; recrystallization, dolomitization, depositional environments; major groups of lime-secreting organisms; energy interpretations; diagenesis, and porosity formation. *Prerequisite:* Geology 3325 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 (6) advanced) from the following list of courses: Geography 3106, 3110, 3207, 3210, 4206, 4306, 3312, 3407, 4410, and Geology 3315 and 3359.
- 3106 Physical Geography (\$2) (2-2)**  
 Study of the basic physical elements, emphasizing climate, land forms, soils, drainage, and natural vegetation.
- 3110 Cultural Geography (3-0)**  
 Introduction to cultural elements, the spatial distribution, and their inter-relationship to the physical environment.

**3207 Economic Geography (2-2)**

Study of the physical and economic factors affecting the distribution and inter-relationship of world resources and commodity production. *Prerequisite:* Geography 3106, 3110 or permission of instructor.

**3210 Geomorphology (\$2) (2-3)**

Analysis of geomorphic processes and landforms, with special reference to conditions and surface expressions in North America and their interpretation from topographic, and geologic maps and aerial photographs. *Prerequisite:* Geology 3103, 4101, 3106, or 3205.

**4206 Weather and Climate (\$2) (3-3)**

Study of the components of weather, weather processes, and their measurement; climatic elements and control factors; geographic classification of climatic and vegetable types on the earth's surface. *Prerequisite:* Geography 3106, or Geology 3103 or 4101, or permission of instructor.

**4306 Geography of Arid Lands (\$2) (3-3)**

Study of the physical complexes of the world's dry regions; factors emphasized include climate, land forms, water, soils, natural vegetation and the various aspects of human occupancy. *Prerequisite:* Geography 4206, 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 (\$2) (3-3)**

Quantitative and theoretic 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 3210.

MATHEMATICS

WILLIAM J. LEAHEY, *Head*

*Professors* BOYER, LEAHEY; *Associate Professors* BENTZ, GLADMAN, HALL, NYMANN, STRAUSS; *Assistant Professors* BAILEY, DODGE, ELLZEY, FITZPATRICK, FOX, HUNTLEY, KRUSCHWITZ, LIGUORI, LOFF, MARTIN-WILLIAMS, MICULKA, NEVILLE, PROVENCIO, WAGNER; *Instructors* BURGETT, HANSEN.

**MATHEMATICS**

Mathematics 3101 and 3102 are recommended for those students whose mathematics requirements are not explicitly stated in degree plans. Mathematics 3201 is an elective course which will open the way to some advanced elective work in mathematics to the liberal arts or social science student who does not wish to major in mathematics.

**B.A. and B.S. Degree** — A student who wishes to take the B.A. degree with a major in Mathematics must include at least one senior level Mathematics course in his program. A student who wishes to take the B.S. degree with a major in Mathematics must include at least two senior level courses in Mathematics in his program. The advanced hours used to fulfill the major or minor requirements must be approved by the Mathematics Department.

**Placement Test** — A placement test is offered every semester to students whose degree plan will include calculus 4111-3212. Depending on test score, a student may be admitted to Math 4111, to Math 4110, or advised to take another type of course.

**For Undergraduates**

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

**3101 Introductory Mathematics (3-0)**

An introductory course designed to fit the needs of liberal arts students. The objectives are to give the student an appreciation of the logical structure of mathematics and its use as a language to express ideas. Topics include the nature of proof, the number system, and elementary algebra.

**3102 Introductory Mathematics (3-0)**

A continuation of Mathematics 3101. Topics include the algebra of sets, the function concept, and elementary coordinate geometry, trigonometry, statistics, inequalities, and maxima and minima. *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.

**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.

† *May be waived upon recommendation of department head in the case of a student who is a declared major in the department and who has credit for 12 semester hours of work in his major.*

- 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.
- 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 (3-0)**  
A study of selected topics of special interest to the liberal arts student. An introduction to the calculus is included in the course. *Prerequisite:* Mathematics 3102 or its equivalent or a sufficiently high score on the College Entrance Examination Board Test (S.A.T.). 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. *Prerequisite:* Mathematics 3217, or concurrent registration in 3217.
- 3324 Computer Programming and Computer Principles (\$8) (3-1)**  
An introduction to digital computer programming and problem formulation for computers. Includes digital computation theory, functional description of digital computers, the Fortran IV language, and applications to selected numerical methods. *Prerequisite:* Math 3217.
- 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, and the Laplace transform. *Prerequisite:* Math 3217 or concurrent registration in Math 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.



- 3330 Probability**  
 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 3217.
- 3331 Statistics (3-0)**  
 An introductory course in the fundamental concepts of mathematical statistics. *Prerequisite:* Mathematics 3330.
- 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.
- 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 3212.
- 3425 Modern Algebra (3-0)**  
 Groups, rings, integral domains, and fields. *Prerequisite:* Mathematics 3323 or consent of instructor.
- 3426 Modern Algebra (3-0)**  
 Continuation of Mathematics 3425. *Prerequisite:* Mathematics 3425.
- 3429 Numerical Analysis (\$8) (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.
- 3431 Introduction to Point Set Topology (3-0)**  
 Topological spaces, continuous mappings, homeomorphisms and topological properties. *Prerequisite:* Mathematics 3323.
- 3436 Higher Mathematics for Engineers and Physicists (3-0)**  
 Series solutions of differential equations, Fourier series, Bessel's equation and Bessel functions, Legendre's equation and Legendre polynomials, the Sturm-Liouville theorem and eigen function expansions. *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 3323, or six advanced hours of Mathematics and the consent of the instructor.
- 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 3323.
- 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 consent of instructor.

**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 3435 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 3426 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 3442 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 or its equivalent as determined by the instructor.
- 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.
- 3598-99 Thesis Course for the Master's Degree**

## PHYSICS

OSCAR H. MCMAHAN, *Acting Head*

*Professor Emeritus* EDWIN J. KNAPP;

*Professors* BARNES, BOLEN, MCINTYRE, MCMAHAN;

*Associate Professors* BLUE, BOWEN, BRIENT, BRUCE, DEAN, SCHUMAKER;

*Assistant Professors* COOPER (on leave), LAWSON, PROVENCIO, SLUSHER;

*Lecturer* WEBB; *Teaching Assistants* ARMENDARIZ, PEARTREE, STEWART.

*Departmental Requirements:*

For the Bachelor of Science degree in Physics the student is required to take thirty-six semester hours of Physics, including Physics 4115, 4216, 1216, 4217 or their equivalent, which are the prerequisites for all upper division Physics courses, and Physics 3351, 3352, 3441, 3442 and at least eleven additional semester hours to be selected in conference with the Physics faculty advisor or the Head of the Physics Department.

Those persons in Geophysics (including Atmospheric Physics) will be allowed to substitute equivalent courses from Physics 3427 and 3428 for Physics 3352 and 3442 with permission from the Head of the Physics Department.

For the Bachelor of Arts in Physics the student is required to take twenty-five semester hours of Physics, including Physics 4115, 4216, 1216, 4217 or their equivalent, and Physics 3351 and 3441 and at least nine additional hours to be selected in conference with the Physics faculty advisor or the Head of the Physics Department.

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

**3101 Principles of Physical Science (\$4) — Fall Semester (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 highly recommended for Elementary Teachers. Open to all students.

**3102 Principles of Physical Science (\$4) — Spring Semester (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 highly recommended for Elementary Teachers.

**4103 General Physics (\$4) (3-2)**

Mechanics and heat. This course may not count as physics toward a major or minor in physics or as a prerequisite to any course in physics other than Physics 4104.

**4104 General Physics (\$4) (3-2)**

Electricity, magnetism, sound, and light. This course may not be counted as physics toward a major or minor in physics or as a prerequisite to any course in physics. *Prerequisite:* Physics 4103.

**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 (\$4) — Fall Semester (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.
- 4108 Elementary Astronomy (\$4) — Spring Semester (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.
- 4115 Mechanics (\$4) (3-3)**  
*Prerequisite:* Mathematics 4111 or concurrently and one unit of high school physics or approval of Head of the Physics department.
- 4216 Electricity and Magnetism (4-0)**  
*Prerequisite:* Mathematics 4212 or concurrently and Physics 4115 or Civil Engineering 3238, Physics 1216 concurrently for all except those in Engineering.
- 1216 Laboratory for Physics 4216 (\$4) (0-3)**
- 4217 Optics, Sound and Heat (\$4) (3-3)**  
*Prerequisite:* Physics 4115 or Civil Engineering 3238 and Mathematics 4212 or concurrently.

#### For Undergraduates and Graduates

All of the following courses have the prerequisites of Physics 4115, 4216, 1216, 4217, or the equivalent and any other prerequisites shown in the description of the course.

- 4320 Introduction to Geophysics (\$5) — 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 (\$5) — 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 — Fall Semester (3-0)**  
A brief study of geometrical optics, Physical Optics dealing with waves, interference, diffraction, absorption, scattering, polarization, magneto- and electro-optics. Quantum Optics is introduced.
- 4324 Applied Geophysics (\$5) — 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.
- 3325 The Fundamentals of Modern Physics (3-0)**  
A study of gaseous ions, electrons, cathode rays, isotopes, alpha, beta, and gamma rays, positrons, neutrons, relativity, the quantum, natural radioactivity, and the various accelerators of charged particles. The most recent developments and applications will be emphasized.
- 3326 Fundamentals of Modern Atomic Physics (3-0)**  
A study of the atom using the vector Model for Hydrogen atom and complex atoms. Spectra, selection rules, Zeeman, Paschen-Bach and complete Paschen-Bach effects. An introduction to the operator algebra of Quantum Mechanics and the Quantum Mechanical study of the particle in a box, harmonic oscillator and Hydrogen atom.

- 3427 Theoretical Geophysics — Fall Semester (3-0)**  
A study of hydrodynamics, elasticity, and gravitational potential fields. A working knowledge and understanding of fundamentals of geophysics is emphasized with special emphasis on earth problems. *Prerequisite:* Mathematics 3326 or 3436.
- 3428 Theoretical Geophysics — Spring Semester (3-0)**  
A continuation of Physics 3427. *Prerequisite:* Mathematics 3326 or 3436.
- 3330 Applied Radiation Physics (\$5) — 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 (\$5) — Fall Semester (3-3)**  
Physical electronics, transistors and other semiconductor elements. Also includes elementary equivalent circuits and circuit theory.
- 4340 Electronic Systems (\$5) — 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 (\$5) — 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 4217 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. Vector theory is developed in the course as needed. *Prerequisite:* Physics 3351, or permission of Department Head. 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. Some elementary circuit theory is derived from electromagnetic theory. *Prerequisite:* Physics 3441.

- 3445 Electromagnetic Waves and Radiating Systems — Fall Semester (3-0)**  
Application of Maxwell's equations to electromagnetic wave transmission, reflection, and refraction, including the study of guided waves, transmission lines, and antennas. *Prerequisite:* Physics 4340 or Engineering 4340 or Physics 3441 or concurrently.
- 2446 Senior Laboratory (\$5) (Both Semesters) (0-6)**  
May be repeated once for credit. *Prerequisite:* Senior standing and Physics 2343 or 2344.
- 1447-3447 Undergraduate Research Problems in Physics (\$5) (Both Semesters)**  
Credit will be granted only on the recommendation of the Head of the Physics Department, in consultation with the research advisor. Maximum allowable credit six hours. *Prerequisite:* Senior standing and must have a 3.0 average in Physics and have the permission of the research advisor and Head of the department, and Physics 2343 or 2344.
- 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, Nuclear, and Particle Physics (3-0)**  
Theory of lattice vibrations and conduction, paramagnetism, and ferromagnetism; Nuclear Structure, scattering processes, and models, Beta decay; Cosmic rays and Elementary particles. *Prerequisite:* Physics 3457 and 3351; and Physics 3322 is recommended.
- 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 Meteorology

logical 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. Grometric 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 the Department Head.

**1476-3476 Seminar in Advanced Topics (Both Semesters)**

*Prerequisite:* Senior standing and permission of Head of the department. Maximum allowable credit six hours.

**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, 3561, 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.

**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 3458.
- 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 — Fall 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 — Spring Semester (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.
- 1591-3591 Research Problems in Physics — Every Semester**  
May be repeated for credit; maximum credit allowed is six hours. May not be counted as thesis research. *Prerequisite:* Permission of Physics Department Chairman of Committee on Graduate Studies.
- 3593 Special Topics in Physics**  
Topics to be announced. May be repeated for credit.
- 1595-3595 Graduate Seminar — Every Semester**
- 3598 Thesis Course for the Master's Degree — Every Semester**
- 3599 Thesis Course for the Master's Degree — Every Semester**



## ☞ DIVISION OF STUDENT AFFAIRS ☞

The Office of the Dean of Students is responsible for all student affairs. The Dean of Students coordinates the total student personnel program which is designed to complement the academic program of the University. This division consists of the Office of the Dean of Students, the Assistant Deans of Students, the Counseling Service, the Financial Aid and Placement Offices, the Student Association, Intramural Athletics, the Student Health Service, and the Union Program. The staff members are available to talk over personal or organizational problems, and to answer questions that concern members of the student body.

The Counseling Service is maintained by the University to assist students in the selection of their careers, planning their college courses, and in meeting personal problems. The University Health Service provides emergency care, first aid treatment, and temporary hospitalization for University students.

The personnel in the Office of the Dean of Students 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, an applicant must have a "B" average. All selections are made by the Faculty Committee on Scholarships and recipients ordinarily are selected from those who have a 3.5 (B+) high school final average and who score above average on the College Entrance Examination Board Scholastic Aptitude Test.

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 deadlines for application is March 1; however, SAT scores may be submitted at later dates when necessitated by national testing schedules.

The University of Texas at El Paso is especially desirous of attracting students who show high academic promise. Advanced placement and credit, honors classes, honorary organizations, and an honor dormitory have been instituted to

challenge superior students and facilitate their achievement.

For further information write:

ASSISTANT DEAN OF STUDENTS  
The Union West 102W  
The University of Texas at El Paso  
El Paso, Texas 79999

### *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 required to register with the Placement Office prior to graduation. Seniors should check with the Placement Office at the beginning of their



senior 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 all 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 with the Placement Office early in their senior 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**

Co-op Programs have been established with the Corps of Engineers, White Sands Missile Range, National Aerospace Agency, International Business Machines, Goodyear Tire and Rubber Company, U. S. Army Strategic Communications Command, Ling Temco Vought, Fort Bliss Engineering Department, and the Bureau of Reclamation. 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. Applications are re-

quired to complete the Parents Confidential Statement of the College Entrance Examination Board 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 \$2,500 depending on the availability of funds.

*The National Defense Loan Program* is jointly sponsored by the Federal Government and The University of Texas at El Paso. The National Defense 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 June 1 of each year.

*The Texas Opportunity 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 five years after the student graduates or ceases to attend college. The first payment is due four months after graduation or withdrawal.

The deadlines for applying for TOP loans are August 1st for Fall semester, December 15 for Spring semester, and April 15 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. Some of the funds are highly restrictive. Only one loan can be made in a semester. It is suggested that interested students contact the Financial Aid Office.

*The Rebekah Coffin Loan Fund:* This loan fund was established in July, 1963 by donations from friends of Rebekah Coffin who taught in El Paso and Barstow, Tex.

**The Hogg Foundation Loan Fund:** This is a division of the Hogg Foundation. It was set up in the will of the late Will C. Hogg, to be administered by the University as the agent. It was originally chartered in July, 1931 in the amount of \$30,869.86. A total of \$9,900.00 is invested in government bonds and the balance is in cash. It was originally established as a memorial to Will C. Hogg and ex-students of the College of Mines and of the University of Texas. Applicants should be native Texans and graduates of Texas Public Schools.

**U.T. El Paso Women's Auxiliary Loan Fund:** This fund was established by the Women's Auxiliary and is administered by the loan office of the University.

#### **Educational Opportunity Grants Program**

The Educational Opportunity Grants Program, authorized by the Higher Education Act of 1965, 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 June 15 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 legal 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 were 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.

**Mining and Metallurgy Loan Fund:** This fund was established in September of 1958. Loans are to be made available on recommendations of the Chairman of the Mining and Metallurgy Department.

**Foreign Student Loan Fund:** This fund was established to assist foreign students attending The University of Texas at El Paso.

**Rebecca Stoddart Chapter - D. A. R. Loan Fund:** This fund was established in January of 1961 with the amount of \$175. It has one restriction, that the Loan Fund be kept in the name of the Rebecca Stoddart Chapter—Daughters of the American Revolution.

**U.T. El Paso Ex-Student's Loan Fund:** This fund was established by the Ex-Students of The University of Texas at El Paso and is administered by the Student Loan Committee.

**Engineering Loan Fund:** This loan fund was established in October, 1939, by John W. Kidd for loans to Engineering and Geology students.

**U.T. El Paso Loan Fund:** This fund is made up of small contributions from students and friends of the University. It is administered by the Student Loan Committee.

**El Paso Chapter—National Office Management Association:** This fund was established in the amount of \$200 in September of 1959, for Business Administration students.

**All inquiries regarding Financial Aid & Placement should be accompanied by a stamped self-addressed envelope and sent to:**

Director  
Financial Aid & Placement  
The University of Texas at El Paso  
El Paso, Texas 79999

# 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 member of the Western Athletic Conference, The University of Texas at El Paso participates in a wide range of intercollegiate sports and has, in recent years, earned national fame.

For example, the Miners whipped Mississippi, 1967, and TCU, 1965, in the Sun Bowl. Sandwiched in between these victories the basketball team sprinted to the NCAA national championship in 1966.

U. T. El Paso students have authored world titles in the two-mile run and the broad jump and the baseball team has been on the upswing since it was added to the program in 1962. Latest sport added to the program is wrestling.

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. Basketball is another big time sport and the Miners have, in recent years, participated at the famed Madison Square Garden, the Chicago Stadium, etc. 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 Faculty-Student Intramural Board. The four major sports are football, basketball, volleyball, and softball. Other activities range from handball to golf. Sororities, fraternities, residence councils, and religious and independent organizations vie for the overall team championship.

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 Board

Composed of students, faculty, and administrators, The Union Board advises on policies relating to the operation, administration, and use of The Union.

### The Union Council

The Union Council is composed of seven program committees. These are: Exhibits, Forum, Films, Hospitality, Publicity, Entertainment, and Recreation. Each committee has a chairman together with a Chairman of the entire Council and a Council secretary.

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.

## ORGANIZATIONS

Other major participation areas include student publications, governmental organizations, five national sororities, and eight national fraternities, music and drama groups, and departmental organizations. There are more than one hundred different groups from which a student may choose his activities. They are:

- Accounting Club of UTEP* – to promote accounting profession among students.
- Alpha Beta* – Men's service club.
- Alpha Chi*—Scholastic honorary for Juniors and Seniors.
- Alpha Epsilon Rho* – Honorary radio society.
- Alpha Kappa Lambda* – National social fraternity.
- Alpha Lambda Delta* – National honorary society for freshmen women.
- Alpha Phi Alpha* – National Social Fraternity.
- Alpha Phi Omega*—Local social fraternity.
- Alpha Psi Omega* – Honorary drama society.
- Alpha Sigma Mu*—National honorary metallurgical engineering society.
- 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.
- Associated Women Students* – Organization of all regularly enrolled women students.
- Association for American Education* – to motivate and orient local high school students toward higher education.
- Association for Childhood Education*—Organization of future elementary school teachers.
- Baháí Student Association.*
- Baptist Student Union.*
- Bell Hall Dorm Council.*
- Beta Epsilon Pi* – Engineering Honorary.
- Burges Hall Dorm Council.*
- Campus Crusade for Christ.*
- Cannoneers* – to promote spirit with the touchdown gun.
- Canterbury Association* – Episcopal students.
- Cardinal Key* – Junior women honorary service organization.
- Chenrizig* – Scholastic and service honorary for senior women.
- 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 Iota* – Mature woman student organization.
- Delta Sigma Pi* – Professional society for men Business majors.
- Engineering Council*—Co-ordinating group for all Engineering activities.
- Golddiggers*—Girls Marching unit.
- Hillel*—Social, cultural and religious organization for Jewish students.
- Honors Council*—Co-ordinating group for Honorary organizations.
- Hudspeth Hall Dorm Council.*
- Institute of Electrical and Electronic Engineers* – Collegiate branch of professional society.
- Inter-American Student Organization* – to promote relations with the "Hispanic World."
- Interdormitory Council* – Representatives from men's and women's dorms who coordinate the athletic, social, cultural and scholarly activities among dormitory students.
- Inter-Faith Council*—Co-ordinating group for all religious clubs on campus.
- Interfraternity Council* – Co-ordinating group for fraternities.
- International Student Organization* – to further understanding and friendship of students of different nationalities.
- Intramural Council* – Co-ordinating group for intramural athletics.
- Kappa Delta* – National sorority for women.
- Kappa Delta Pi*—National honorary education society.
- Kappa Kappa Psi* – Honorary Band and Marching Cavalcade organization.
- Kappa Sigma*—National social fraternity.
- Karate Club.*
- Lambda Chi Alpha* – National social fraternity.
- Lamplighters* – Social and service organization to foster fellowship among members of the Church of Christ.
- LDS Deseret* – Campus organization of Mormon students.
- Literary Society* – This group encourages interest in and knowledge of literature through meetings, group discussions, and lectures. It is open to all students.
- Lloyd A. Nelson Geology Club.*
- Mensa.*
- Music Educators National Conference* – Student chapter for those going into Music professionally.



*National Art Education Association.*  
*Newman Club* — Campus organization of Catholic students.  
*Orange Key*—Scholastic and service honorary for Freshmen and Sophomore men.  
*Organization of Arab Students.*  
*Panhellenic Council*—Co-ordinating group for sororities.  
*Pershing Rifles*—National honorary ROTC fraternity.  
*Phi Alpha Theta* — Honorary history society.  
*Phi Kappa Tau*—National social fraternity.  
*Phrateres International* — International independent service and social group for women.  
*Physical Education Majors Club.*  
*Pi Delta Phi*—Honorary French society.  
*Pi Kappa Delta* — forensics honorary.  
*Pi Sigma Alpha* — Honorary political science society.  
*Pre-Med Club.*  
*Press Club* — Honorary service club for journalism majors and minors.  
*Psi Chi Society*—Honorary Psychology society.  
*ROTC Sponsors* — Auxiliary drill team to the Cadet Corps.  
*Scabbard & Blade* — ROTC honorary society.  
*Sigma Alpha Epsilon*—National social fraternity.  
*Sigma Alpha Iota* — Women's Honorary Professional Music Fraternity.  
*Sigma Alpha Mu* — National social fraternity.  
*Sigma Delta Pi*—Honorary Spanish society.  
*Sigma Gamma Epsilon* — Honorary society for earth sciences.  
*Sigma Pi Sigma* — Honorary Physics society.  
*Society of American Military Engineers* — National professional society for ROTC and Engineering students.  
*Society of Physics Students.*  
*Society of Women Engineers.*  
*Spurs* — National service organization for Sophomore women.  
*Student Action Committee on Foreign Policy.*  
*Student Education Association.*  
*Student Legal Association.*  
*Tau Beta Sigma*—Honorary service society to promote band activities.

*Tau Kappa Epsilon* — National social fraternity.  
*United Afro-American Students.*  
*United Campus Christian Fellowship*—Interdenominational religious organization consisting of the following groups: Presbyterian, United Lutherans of America, Christian Church, Congregational.  
*University Chorale.*  
*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 programs 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 by a vote of the student body to reign over the week's activities. Classes are dismissed Homecoming Day and the students participate in the Downtown Parade featuring beautiful floats, bands, and gala costumes. A barbecue follows the parade at which time trophies are awarded to the most outstanding floats and house decorations. The Homecoming Queen and her court are crowned at the dance and are presented at the Homecoming football game.

#### **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.

#### **Co-Ed Ball**

A Christmas dance is held each year and is sponsored by the Associated Women Students. At this time, the girls make all the arrangements including making the date and paying for it. The "beaus" are feted at this traditional dance where the selection of the Co-Ed King and his court is announced and they are crowned.

#### **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.

**Flowsheet Queen**

Each year a nationally known celebrity is asked to act as judge in the Flowsheet Queen Contest. The identity of the Queen is not revealed until the yearbook is distributed in May. Any woman student at The University of Texas at El Paso may participate by submitting an 8 x 10 glossy photograph to the Flowsheet. From these photographs come the winner and runner-ups in the contest.

**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.





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# ***Official Regulations***

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## ***Student Expense***

[ TUITION ]

## ***Regulations Affecting Student Life***

[ CONDUCT - DISCIPLINE ]

## ***Scholastic Regulations***

[ GRADES ]

## ***Statistics***

## ***Index***

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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.

### Resident and Non-Resident Students

1. A student under 21 years of age is classified as a **RESIDENT** student if his parents are living in the State of Texas at the time of his registration and have lived within the state for a period of at least 12 continuous months immediately prior to the date of registration.

2. Persons in the military services of the United States of America who are stationed in Texas by assignment to duty within the borders of this State shall be permitted to enroll themselves, their husbands or wives as the case may be, and their children in State institutions of higher learning by paying the tuition fees and other fees or charges provided for regular residents of the State of Texas, without regard to the length of time such officers, enlisted men, selectees or draftees have been stationed on active duty 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.

3. A student under 21 years of age is classified as **NON-RESIDENT** if his parents do not reside in the State of Texas or have not lived within the State during the full 12 months prior to his registration.

4. A student over 21 years of age who comes from out of the State of Texas is classified as a **NON-RESIDENT** student unless he has resided within the State for 12 full months, not enrolled in an educational institution, prior to the date of registration.

5. An alien is classified as a **NON-RESIDENT**, except as provided in paragraph 9 of next section.

### Legal Residence

The following statements are intended to clarify certain points and answer some of the questions that may arise. For additional information contact the Registrar's Office.

1. The legal residence of one who is under 21 years of age is that of the father. Upon death of the father, the legal residence of a minor is that of the mother.

2. If the parents are divorced, the residence of a minor is the same as that of the parent with whom he has lived during the 12 months preceding registration. If he has not lived with either parent, the residence of the father shall control. If custody is granted to some person other than a parent, the residence of that person shall control for so long as the minor actually makes his home with such person.

3. The residence of a wife is that of her husband.\*

4. Individuals who have come from without the State of Texas and who are within the State primarily for educational purposes are classified **NON-RESIDENT**. Registration in an educational institution within 12 months after having arrived in the State is considered as evidence that the individual is in the State for educational purposes.

5. The fact that an individual or family has bought property, established a business, paid taxes, voted, has become the legal ward of or has been adopted by a Texas resident does not affect the 12 months residence requirement.

6. The fact that a student is self-supporting or is supported wholly or in part by a Texas resident does not affect his classification as **RESIDENT** or **NON-RESIDENT**.

7. Employees of Texas State institutions of higher learning or their dependents who have lived in Texas less than one year are eligible for resident classification under the same provisions that are made for military personnel in paragraph 2 of the preceding section. Applications must be made in the Office of the Registrar.

8. If the parents of a **RESIDENT** student under 21 years of age move out of the State, that student is classified as **NON-RESIDENT** for all subsequent semesters.

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\*A woman student of the University who is classified as a resident student and while so classified marries a nonresident shall be classified as a nonresident for all enrollment periods subsequent to her marriage; provided however, that she shall be permitted to pay the resident tuition so long as she does not affirmatively by her actions adopt the legal residence of her husband.

9. In the case of an alien who has applied for naturalization in the United States, the 12 months period required to establish residence begins with the date of acceptance of his petition for citizenship.

10. Every student classified as a non-resident student shall be considered to retain that status and shall be obligated for the payment of the non-resident tuition fee until such time as he shall have made written application for re-classification in the form prescribed by the University and shall have been officially re-classified in writing as a resident by the Registrar of the University.

11. If emancipation in the case of a minor is clearly proved, the residence classification of the minor will be determined by the statutory requirements applicable to those over 21 years of age.

12. It is the responsibility of the student to pay the correct fee at the beginning of each semester or term for which he may register.

**TUITION**

Under the authority of House Bill No. 265 enacted into law by the Fifty-fifth Legislature, the Board of Regents has fixed rates of tuition. These rates of tuition are subject to change by the Legislature of the State of Texas.

**Long Session (each semester)**

Semester Hours	Resident	Non-resident
12 or more	\$50.00	\$200.00
11	47.00	183.50
10	43.00	167.00
9	39.00	150.50
8	35.00	134.00
7	31.00	117.50
6	27.00	101.00
5	23.00	84.50
4	19.00	68.00
3 (or less)	15.00	51.50

**Summer Session (each term)**

Semester Hours	Resident	Non-resident
6 (or more)	\$25.00	\$101.00
5	23.00	84.50
4	19.00	68.00
3 (or less)	15.00	51.50

**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 question of his right to legal residence in Texas under the State law and University rules,

to raise the question with the Registrar and have such question settled prior to registration. There can be no change of residence except upon express authorization by the Registrar. 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 Registrar.

**REFUND OF TUITION**

A refund of the tuition is made only to students withdrawing 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:

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

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



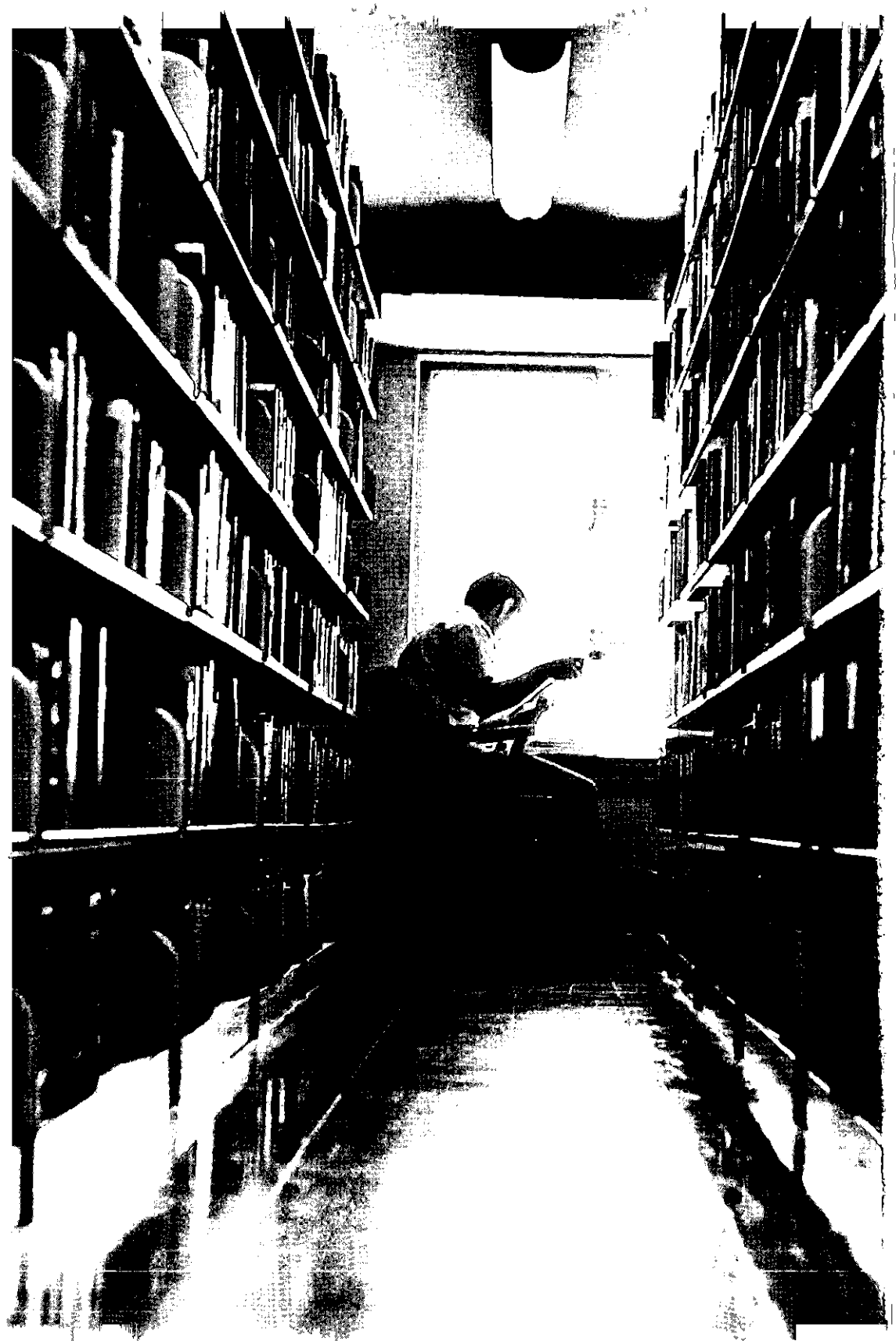
and certain required academic fees but not from the payment of deposits. To obtain this exemption, the student must make application on the form prescribed by and obtained from the Business Manager. Certified or photostatic copies of the discharge certificate and service record must be attached to the 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.

<b>Laboratory Fees</b>	<i>per semester</i>
Art 3201, 3205, 3301, 3305, 3311, 3312, 3321, 3322 . . . . .	\$4.00
3202, 3203, 3204, 3208, 3215, 3302, 3303, 3304, 3308, 3315 . . . . .	8.00
3405, 3406, 3407, 3408, 3409, 3410, 3502 . . . . .	10.00
Biology 4101, 4102, 4110, 4202, 4203, 4301 . . . . .	4.00
3111, 3112 . . . . .	5.00
4327, 4401 . . . . .	6.00
2498-6498 . . . . .	8.00
Botany 3210, 3211, 3301, 3320, 3323, 3414, 3415, 4103 . . . . .	4.00
4313 . . . . .	6.00
Microbiology 4201 . . . . .	4.00
3334, 3424, 4202, 4302, 4425, 4461 . . . . .	6.00
4460 . . . . .	7.00
Zoology 3204, 3301, 3303, 3305, 3307, 4103, 4306, 4463, 4464 . . . . .	4.00
3302 . . . . .	6.00
4304, 5201 . . . . .	7.00
3502, 3508 . . . . .	8.00
<b>Business Administration:</b>	
Accounting 3101, 3102 . . . . .	2.00
3304 . . . . .	5.00
Business Area 3102, 3203 . . . . .	2.00
Office Management & Business Education 3101, 3102, 3103, 3104, 3301, 3302 . . . . .	2.00
3305 . . . . .	6.00
Production Management 3304 . . . . .	2.00
Statistics & Quantitative Analysis 3201, 3301 . . . . .	2.00
Chemistry 3103, 3104 . . . . .	4.00
4224, 4225 . . . . .	5.00
3468, 4103, 4221, 4321, 4450 . . . . .	6.00
4104 . . . . .	7.00
2476, 4360, 4361, 4470, 5213 . . . . .	8.00

<b>LAB FEES (continued)</b>	<i>per semester</i>
<b>Engineering:</b>	
Civil Engineering 4442, 4448, 4456 . . . . .	2.00
4470 . . . . .	6.00
Electrical Engineering 3465, 3474, 4277, 4278, 4251, 4352, 4447, 4513 . . . . .	2.00
2310 . . . . .	4.00
Mechanical Engineering 3103, 3104, 3205, 3236, 3464, 3484, 3485, 3501, 4351, 4354, 4363, 4395, 4377, 4466, 4508 . . . . .	2.00
Metallurgical Engineering 3101, 3102, 4302, 4403 . . . . .	2.00
3103, 3404, 4203, 4407, 4411, 4412, 4415 . . . . .	3.00
3502, 4501, 4502, 4506, 4507, 4509, 4512, 4513 . . . . .	6.00
Geology 2215, 3305, 3320, 3323, 3324, 3325, 3330, 3450, 3455, 3460, 3461 . . . . .	2.00
3327, 3440, 4216, 4217, 4218, 4219 . . . . .	4.00
3103, 3104, 3205, 3359, 3405, 3410, 3451, 3463, 3575, 4101, 4102 . . . . .	5.00
3322 . . . . .	25.00
Physical Geography 3106, 3210, 4206, 4306, 4410 . . . . .	2.00
Physical Education 1101, 1102 . . . . .	2.00
Mass Communication 3308, 4207 . . . . .	5.00
Mathematics 3324, 3429 . . . . .	8.00
Music 2171, 2172, 2271, 2272, 2371, 2372 . . . . .	4.00
Piano Sight Reading 2373, 2374 . . . . .	2.00
Applied 2181, 2182, 2191, 2192, 2281, 2282, 2291, 2292, 2381, 2382, 2391, 2392, 2481, 2482, 2491, 2492 . . . . .	25.00
3181, 3182, 3191, 3192, 3281, 3282, 3291, 3292, 4191, 4192, 4291, 4292 . . . . .	45.00
3381, 3382, 3391, 3392, 3481, 3482, 3491, 3492, 4391, 4392, 4491, 4492 . . . . .	50.00
Physics 1216, 3101, 3102, 4103, 4104, 4107, 4108, 4115, 4217 . . . . .	4.00
1447, 1475, 2343, 2446, 2447, 3330, 3447, 4320, 4321, 4324, 4339, 4340 . . . . .	5.00
Psychology 3103 . . . . .	2.00
3221, 3222, 3401 . . . . .	3.00
3523 . . . . .	5.00
<b>Transportation Fees</b>	
Geology 6465 . . . . .	Amount Determined by Location for Field Trip.



**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 \$35.00 for each semester of the long session and \$17.50 for each six weeks summer term. Refund of the student building use fee for students withdrawing is made on the same basis as refund of the registration and tuition fee for students withdrawing.

**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 an exemption as mentioned on page 225 are not exempt from payment of this fee.

**Student Services Fee** — Under the authority of legislation enacted by the 56th Legislature, the Board of Regents has authorized a Student Services Fee in the amount of \$26.00 for each semester of the Long Session and \$7.50 for each term of the Summer Session. This fee is required of every undergraduate student registering for twelve (12) or more semester hours during a long session semester or four (4) or more semester hours during a term of the Summer Session.

This fee is optional for graduate and part-time students. Activities to be supported from this source of income are the Health Service, Student Association, Intramurals, Intercollegiate Athletics, Student Publications, Swimming Pool, Band, Choir, Orchestra, Co-ed Association, Forensics, Associated Women Students, University Players, Marching Cavalcade, and Opera and Ballet.

Refund of the fee will be made only under the same conditions as the Tuition upon surrender to the Business Office of the Student Identification card, the Student Association Card, the 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.

**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 operative to the permanent use and purpose 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.

## HOUSING

The University considers it a distinct advantage for all boarding students to live in the dormitories on the campus. Every attention will be given for the improvement of the social and educational life of boarding 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 counselors, 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 Dean of Students who delegates supervision to the Director of Housing.

All single undergraduate students not living with their parents are required to live in the dormitories on the campus to the full capacity of the facilities. The University administers five 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.

### RESIDENCE HALLS

There are three men's residence halls and two women's residence halls on the University Campus. All of these facilities are owned and operated by the University. Complete information including rates, reservations and application procedures is available from the Office of the Housing Director.

### STUDENT FAMILY 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 \$25.00 Housing Deposit to the Housing Office and complete a Student Family Housing Application Form. Units rent for \$100.00 per month, effective September 1, 1970.

# POLICIES AND PROCEDURES AFFECTING STUDENT LIFE

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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 Dean of Students 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

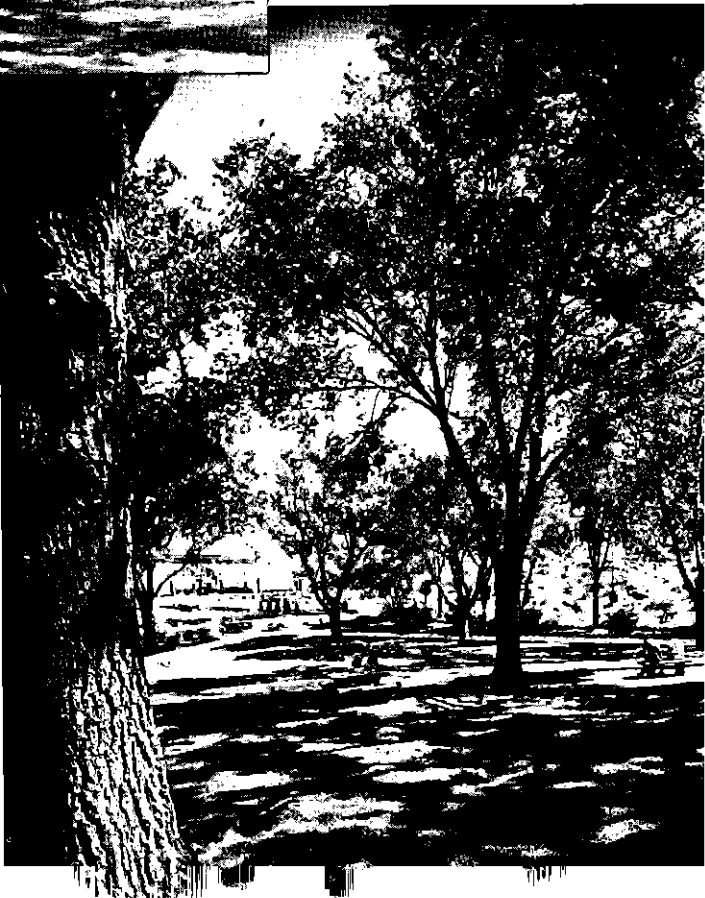
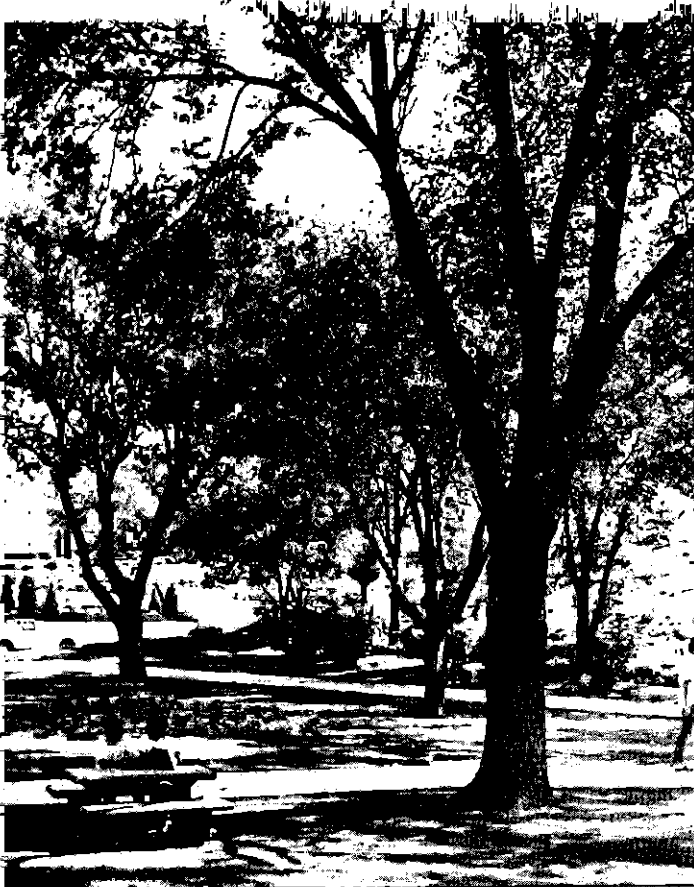
Penalties which may be imposed include the following: admonition, warning probation, disciplinary probation, suspension, and expulsion. In addition, certain privileges may be withdrawn consistent with the severity of the offense and the rehabilitation of the student.

These penalties may be imposed singly or in any combination upon individuals, groups, or organizations.

### 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 transactions. 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 grades and official transcript, (c) withholding of a de-

gree to which the student otherwise would be entitled.

**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 dropped.





## **Student Responsibility**

Every student is responsible for knowing the current scholastic regulations of the University.

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.

## **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.

## **Adding Courses**

A course may be added within the stipulated time limit by (a) authorization of the Academic Dean, (b) validation by the Business Office, and (c) filing with the Registrar.

## **Change of Major**

A student who wishes to change his major must obtain the signatures of the Department Heads losing and gaining him and the change form must be filed with the appropriate Academic Dean.

## **Changing Courses**

A course may be changed within the stipulated time limit by (a) authorization of the Dean, (b) validation by the Business Office, and (c) filing with the Registrar.

## **Changing Sections**

Once a student has registered for a given section of a course, the section may not be changed at the request of the stu-

dent until after the close of the regular registration period. Instructors may change students from one section to another at any time for the purpose of balancing enrollments in sections, correcting scheduling errors, and for any other necessary purpose. Changing the section of a course requires (a) authorization by the head of the department concerned, (b) permission of the Academic Dean, (c) validation by the Business Office, and (d) filing the change with the Registrar.

## **Dropping Courses**

A course may be dropped by (a) authorization of the Dean and (b) filing with the Registrar. The grade to be given by the instructor will be *W* or *F* depending upon the student's standing in the course at the time.

A student may withdraw from a course until two weeks after mid-semester of a regular session or at the end of the fourth week of a summer term. After these dates, withdrawal is not normally permitted. Under unusual circumstances permission to withdraw may be granted by the student's Academic Dean. The permission to withdraw will be transmitted to the instructor who will assign a grade of *W* or *F*.

On the recommendation of the instructor concerned, approved by his 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*.

## **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 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.

## **Absences from Classes**

(a) Uniform and punctual attendance upon all exercises at which the student 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 the mid-semester report date.

(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.

#### **Absence from Tests**

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.

#### **Tardiness**

Repeated tardiness will be considered as equivalent to absence from class, and reported as such.

#### **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.

A student may not register for more than seven semester hours in classes scheduled during the evening hours without the written permission of his Dean.

*Engineering and Business Students* — Beginning freshmen may not register for more than seventeen semester credit hours except with permission of the Dean. Sophomores, juniors and seniors may not register for more than nineteen semester credit

hours except with permission of the Dean of Engineering or Dean of Business.

*Other Undergraduate Students* — Beginning freshmen may not register for more than sixteen semester hours except with permission of the Dean.

Other students, with the permission of the Dean, may register for nineteen semester credit hours if the cumulative average is at least 2.5, or if the grade-point average is at least 2.5 in a minimum of twelve semester credit hours for the preceding semester. Other students may register for 21 semester hours if the cumulative average is at least 3.0, or if the average is at least 3.0 in a minimum of twelve semester hours for the preceding semester. A full summer session in which the student earned twelve semester hours may be counted as a semester. The cumulative average alone never qualifies a student for an overload if he has earned less than thirty semester hours.

In no case may a student register for a total of more than 15 semester credit hours in a full summer session. With the written permission of the Dean, a student may register for 9 semester credit hours in a single summer term if he has completed or agrees to register for six hours in the other term of the summer session of the same year and if he presents his official degree plan showing that he would thereby be able to complete all courses required for graduation at the end of the summer session. The Dean may at his discretion waive this rule in the case of a student who has completed 60 semester hours or more with a cumulative grade point average of 3.5 or higher.

#### **Official Notices**

Official notices are posted on bulletin boards, published in the Prospector, read to classes and sent to students individually. Students are held responsible for knowledge of and compliance with such notices.

### **Classification**

*Regular Students* — Those who are registered for twelve or more credit hours.

*Irregular 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.

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. However, if compelled to be absent from the final examination on account of illness or other imperative cause, the student is entitled to take a postponed examination. (See Postponed Final Examinations.)

### Postponed Final Examinations

Postponement of the final examination is subject to the following conditions:

1. Only in case of absence due to illness or other imperative and unavoidable cause.
2. Permission to be obtained from the Dean, validated by the Business Office for a fee of one dollar, and filed with the Registrar at least four days before the date of the examination.
3. Must be taken within a year from the date from which the examination was postponed.
4. The grade during the period of postponement to be *X*.

5. Absence from a postponed examination, after a permit has been granted, gives a grade of *F* in the course.

6. The Registrar supervises the examination.

### Proficiency Examinations

These are examinations for credit and are subject to the following conditions:

1. Permission to be obtained from the head of the department and the Academic Dean and validated by the Business Office for a fee of one dollar, and filed with the Registrar at least four days before the date of the examination.
2. Must be taken at a date fixed by the Calendar.
3. May not be taken to satisfy any part of the last 30 semester credit hours required for graduation.
4. Will be searching in character, strictly graded, and four hours in length.
5. The passing grade is "B".
6. Absence from the examination, after a permit has been granted, gives a grade of *F*.
7. No student is eligible who has registered for or has been given a grade in the course.
8. The Registrar supervises the examination.
9. Student must currently or previously be registered in the University.
10. Credit thus earned is applicable toward a degree from this University only.
11. In some instances, credit is granted on the basis of Advanced Placement Tests given by the College Entrance Examination Board. Further information may be obtained from the appropriate Academic Department Head.

## 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), *I* (incomplete), and *X* (postponed final examination). *S* and *U* respectively are used in reporting pass and fail work by students taking courses on this basis.

Students who officially withdraw from the University during the semester will re-

ceive, grades of *W* in courses which they are passing and *F* in courses which they are failing.

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*.

### 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

Grades for work not completed may be obtained by two distinct and separate methods:

1. At the end of any semester a student may be given a grade of *X* if he unavoidably is absent from the final examination in a course, and such absence is approved by the respective Dean. This procedure obligates the student to take a Postponed Examination in the course as a part of the removal-of-*X* grade.

2. 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.

Unless the Postponed Examination is completed within one calendar year the *X* grade will become an *F*.

### Repetition of Course

If a student repeats a course, the official grade is the last one made; however, the student's cumulative grade point average is determined, for any official purpose, by dividing the total grade points earned by the total number of hours attempted in this University.

### Honor List

At the close of each semester the Registrar's Office will issue an honor list which will include the names of all students who, during the semester, have been registered for not less than fifteen hours of work and who have a grade point average of at least 3.2 without any grades of *X*, *I*, or *F*. (If a *X* or *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

Grade reports are mailed to parents and guardians at the end of each semester. Grade reports are also made on freshmen and all students on scholastic probation in November and March. The latter do not become an official part of the student's record, but merely serve to inform the student and the parents of student's progress during the course of the semester.

Students may receive copies of all grade reports at the Office of the Registrar.

Self-supporting students over 21 years of age, if they request it of the Registrar in writing, may have their grade reports sent to them instead of their parents.

### 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

For students who have registered for less than 25 hours in any college or university, the minimum grade point average requirement is 1.50 in each semester or summer session. A student who receives any grade other than *W* in a course is deemed to have registered for the course. Beginning with the semester in which the student has attempted 24 or more semester hours and for each semester or summer session thereafter, the minimum grade point average requirement is 2.00 for work attempted. A student is on Scholastic Probation at the end of the semester or summer session in which his grade point average falls below the applicable minimum.

### Scholastic Probation

A student on Scholastic Probation who withdraws with grades of "W" in all courses will be continued on Scholastic Probation for the next semester or summer session of attendance.

*Scholastic Probation shall mean that a student may not:*

- a. Register for more than sixteen hours except by written permission of his Academic Dean.
- b. Be absent from classes, except under extenuating circumstances, without being dropped from the rolls of the University by the Registrar at the request of his Academic Dean.

### Removal of Scholastic Probation

A full-time student must pass 12 or more hours to remove Scholastic Probation with all hours attempted counting in the

average. A part-time student must accumulate at least the same number of hours as he was taking when he incurred Scholastic Probation. In either case, the student must achieve a minimum 2.00 average or he will be dropped under Enforced Academic Withdrawal.

### 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 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 who has been dropped for reasons stated under Enforced Academic Withdrawal is eligible for readmission on Scholastic Probation after the following time intervals have elapsed:

1. Dropped for the 1st 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 2nd time: One calendar year.
3. Dropped for the 3rd time: Ineligible for readmission. Exceptions may be made after two calendar years when the President's Academic Council considers the circumstances to be extenuating. Petition for consideration on this basis must be filed

with the Registrar one calendar month before the first day of registration of the semester or term in which readmission is sought.

**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.

**Unofficial Withdrawal**

Withdrawal from the University without consent of the student's 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.



## Statistical Summaries

### STUDENTS — LONG SESSION 1968-69

SCHOOL OF BUSINESS ADMINISTRATION	<i>Men</i>	<i>Women</i>	<i>Total</i>
Freshmen . . . . .	722	151	873
Sophomores . . . . .	371	65	438
Juniors . . . . .	166	29	195
Seniors . . . . .	198	28	226
SCHOOL TOTALS . . . . .	1457	273	1730

SCHOOL OF EDUCATION			
Freshmen . . . . .	329	694	1023
Sophomores . . . . .	150	402	552
Juniors . . . . .	110	213	323
Seniors . . . . .	163	372	535
SCHOOL TOTALS . . . . .	752	1681	2433

SCHOOL OF ENGINEERING			
Freshmen . . . . .	456	5	461
Sophomores . . . . .	216	4	220
Juniors . . . . .	116	1	117
Seniors . . . . .	113	2	115
SCHOOL TOTALS . . . . .	901	12	913

SCHOOL OF LIBERAL ARTS			
Freshmen . . . . .	1278	888	2166
Sophomores . . . . .	461	407	868
Juniors . . . . .	301	220	521
Seniors . . . . .	557	331	888
SCHOOL TOTALS . . . . .	2597	1846	4443

SCHOOL OF SCIENCE			
Freshmen . . . . .	429	251	680
Sophomores . . . . .	234	112	346
Juniors . . . . .	109	26	135
Seniors . . . . .	151	52	203
SCHOOL TOTALS . . . . .	923	441	1364

POSTGRADUATE . . . . .	1172	696	1868
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<i>Total Individual Students . . . . .</i>	7802	4949	12751
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SUMMER SESSION 1969	<i>Men</i>	<i>Women</i>	<i>Total</i>
Students registered in first term . . . . .	3112	2718	5830
Students registered in second term . . . . .	2681	2159	4840
SUMMER TOTALS . . . . .	5793	4877	10670
<i>Total Individuals in Summer . . . . .</i>	3796	3388	7184

## DEGREES CONFERRED

	CONFERRED IN 1968			CONFERRED IN 1969			TOTAL
	Men	Women	Both	Men	Women	Both	1916 - 1969
<b>ENGINEERING:</b>							
Engineer of Mines . . . . .	---	---	---	---	---	---	49
Bachelor of Science in Mining Engineering . . . . .	1	---	1	---	---	---	397
Bachelor of Science in Engineering:							
Civil . . . . .	---	---	---	---	---	---	120
Electrical . . . . .	---	---	---	---	---	---	147
Bachelor of Science in Civil Engineering . . . . .	14	---	14	18	---	18	154
Bachelor of Science in Electrical Engineering . . . . .	32	---	32	26	---	26	297
Bachelor of Science in Mechanical Engineering . . . . .	7	---	7	10	---	10	89
Bachelor of Science in Metallurgical Engineering . . . . .	21	1	22	20	---	20	147
	75	1	76	74	---	74	1400
<b>ARTS and SCIENCE:</b>							
Bachelor of Arts . . . . .	196	151	347	245	140	385	5581
Bachelor of Science in the Sciences . . . . .	81	16	97	73	14	87	1297
Bachelor of Business Administration . . . . .	113	17	130	138	11	149	1717
Bachelor of Music . . . . .	5	11	16	7	15	22	236
Bachelor of Science in Education . . . . .	62	188	250	77	228	305	1708
	457	383	840	540	408	948	10539
<b>GRADUATES:</b>							
Master of Arts . . . . .	29	20	49	31	27	58	1006
Master of Education . . . . .	42	43	85	47	47	94	563
Master of Science . . . . .	29	1	30	58	1	59	110
	100	64	164	136	75	211	1679
<b>TOTAL DEGREES CONFERRED . . . . .</b>							<b>13,618</b>

- Academic Performance, 250  
 Accounting: Courses, 84-85  
 Administration Officers, 5,6,7  
 Admission Methods, 39-40  
 Anthropology, 194  
 Art: Courses 132-134  
     Teaching, 67  
 Bachelor of Arts, 42, 55  
 Bachelor of Business Administration, 61-63  
 Bachelor of Music Degree, 65  
 Bachelor of Science in Education, 71-72  
 Bachelor of Science in Engineering, 46-52  
 Bachelor of Science (sciences), 43, 60  
 Bachelor of Science in Medical  
     Technology, 64  
 Bible: Courses, 135-136  
 Biology: Courses, 198-203  
     Major, 60  
 Black Studies, 59  
 Board of Regents, 4  
 Botany: Courses, 199  
 Broadcasting: Courses, 161-162  
 Business: Courses, 84-92  
     Bachelor of (Degree), 61-63  
 Calendar, 2, 3  
 Chemistry: Courses, 204-206  
 Classification of Students, 247  
 Commencement, 44  
 Conduct, 243-245  
 Convocation (New Student), 3  
 Course Descriptions, 83-223  
 Course Regulations, 246-247  
 Crafts, 132  
 Curriculum, 41-45  
 Degrees Offered, 41  
     Requirements, 44  
     Suggested Plans, 42-43, 46-53  
 Degrees Conferred, 253  
 Deposits:  
     Dormitory, 241-242  
     General Property, 241  
     Military Property, 242  
 Description of University, 25-37  
     Discipline, 243      hazing, 243  
     bad checks, 245      probation, 243, 250  
     debts, 243            rules, 246  
     expulsion, 243      suspension, 243, 250  
 Drama: Courses, 137-139  
 Drawing:  
     Art, 132-134  
     Engineering Graphics, 122  
 Economics & Finance: Courses 93-96  
 Education: Courses, 98-110  
     B.S. Degree, 70-72  
 Employment by the University, 225  
 Endowments, 34-36  
 Engineering: Courses, 111-129  
     Civil Engineering, 112-116  
     Electrical Engineering, 117-121  
     Mechanical Engineering, 122-125  
     Metallurgical Engineering, 126-129  
     Degrees, 46-53  
 English: Courses, 145-151  
     Graduate Courses, 150-151  
 Enrollment Statistics, 252  
 Entrance, 34, 40  
 Events, Annual, 231-233  
 Examinations, 248  
 Expenses, 237-242  
 Expulsion, 243  
 Extra-Curricular Activities, 229-230  
 Faculty, 8-23  
 Fees: payment, refunds, 238  
     Laboratory, 239  
     Registration, 238  
     Special Examination, 241  
     Tuition, 238  
 Financial Aid, 225-228  
 French: Courses, 166-167  
 Freshman Guidance, 2, 3,  
 Geography: Physical 211  
     Cultural, 195  
 Geology: Courses, 207-212  
 German: Courses, 168  
 Grades, 248-249  
 Graduate School, 76-80  
 Graduates, Statistics, 253  
 Graduation Requirements, 44  
 Hazing, 38, 243  
 Health Education: Courses, 107-110



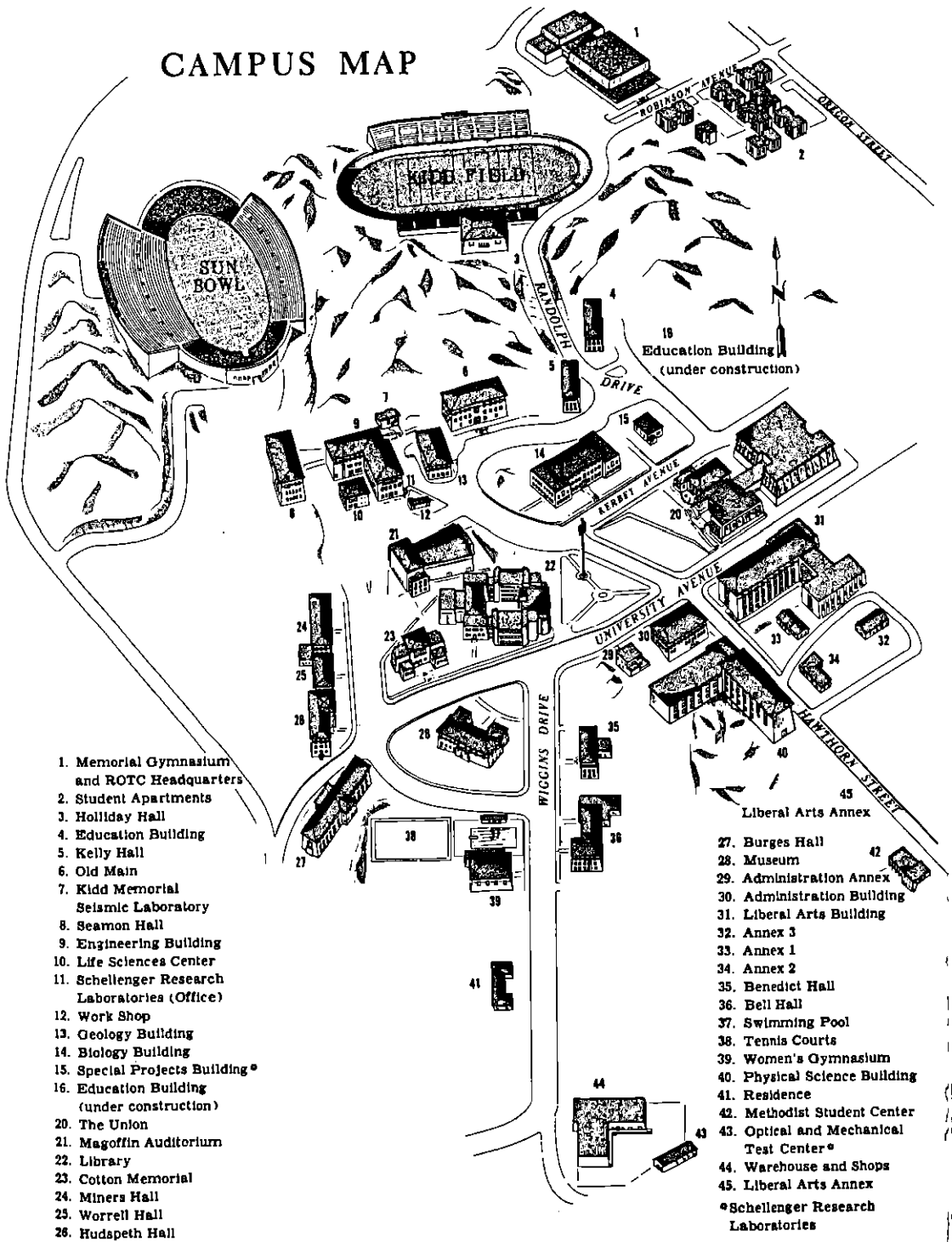


# I N D E X



- History: Courses, 152-158  
    Required, 44  
    Graduate Courses, 157-158
- Honors at Graduation, 45
- Honor List, 249
- Housing, 242
- Inter-American Studies: Major 56
- Japanese: Courses, 168
- Journalism: Courses, 159-161
- Kidd, Memorial, 31
- Laboratory Fees, 239
- Language, Modern: Courses, 166-171  
    Graduate Courses, 171
- Late Registration, 38, 239, 246
- Latin: Courses, 168
- Law, preparation for degree, 55
- Library, 29
- Library Services, 64, 100
- Linguistics Major, 57
- Loan Funds, 227-228
- Mass Communications: Courses, 159-162
- Master of Arts Degree, 78
- Master of Education Degree, 78-80
- Master of Science Degree, 80
- Mathematics: Courses, 213-216  
    Graduate Courses, 216
- Map: Campus, 256
- Medical Technology, 64
- Medicine, preparation for degree, 55
- Mexican American Studies, 58
- Microbiology: Courses, 200-201
- Military Science, 163-165
- Modern Languages: Courses, 166-171
- Museum, 30
- Music: Courses, 172-179  
    Degree, 65; Teaching, 69
- Non-Resident Students, 237-238
- Organizations on Campus, 229-231
- Orientation (New Student), 2-3
- Philosophy: Courses, 180-181
- Physical Education: Courses, 107-110  
    Teaching, 68
- Physics: Courses, 217-223
- Placement Service, 225, 227
- Plan Curriculum, 41-43
- Political Science: Courses, 182-186  
    Required, 44
- Press, 31
- Probation, 243, 250
- Psychology: Courses, 187-190
- Publications, 161
- Purpose of University, 25
- Refund of Tuition, 238
- Registration, 38  
    Dates, 2, 3
- Regulations, Official, 235
- Resident Students, 237-238
- R.O.T.C.: Courses, 165
- Russian: Courses, 169
- Schellenger Foundation, 29-30
- Scholarships, 225
- Scholastic Standards, 44-45, 246-251
- Science: Majors, 43
- Sociology: Courses, 191-195
- Spanish: Courses, 169-171
- Special Services, 29-33
- Speech: Courses, 139-144
- Statistics, 252, 253
- Student Activities, 229-233
- Student Employment  
    Service, 225-227
- Student Regulations, 235
- Suspension, 243
- Teaching Certificate, 66
- Teacher Programs, 67-75
- Tuition, 238; Refund of, 238
- Veterans, 33  
    Exemptions from fees, 238
- Withdrawal, 246, 251
- Zoology: Courses, 201-202

# CAMPUS MAP



1. Memorial Gymnasium and ROTC Headquarters
2. Student Apartments
3. Holiday Hall
4. Education Building
5. Kelly Hall
6. Old Main
7. Kidd Memorial Seismic Laboratory
8. Seamon Hall
9. Engineering Building
10. Life Sciences Center
11. Schellenger Research Laboratories (Office)
12. Work Shop
13. Geology Building
14. Biology Building
15. Special Projects Building\*
16. Education Building (under construction)
20. The Union
21. Magoffin Auditorium
22. Library
23. Cotton Memorial
24. Miners Hall
25. Worrell Hall
26. Hudspeth Hall

16. Education Building (under construction)
14. Biology Building
15. Special Projects Building\*
20. The Union
21. Magoffin Auditorium
22. Library
23. Cotton Memorial
24. Miners Hall
25. Worrell Hall
26. Hudspeth Hall
27. Burges Hall
28. Museum
29. Administration Annex
30. Administration Building
31. Liberal Arts Building
32. Annex 3
33. Annex 1
34. Annex 2
35. Benedict Hall
36. Bell Hall
37. Swimming Pool
38. Tennis Courts
39. Women's Gymnasium
40. Physical Science Building
41. Residence
42. Methodist Student Center
43. Optical and Mechanical Test Center\*
44. Warehouse and Shops
45. Liberal Arts Annex

\*Schellenger Research Laboratories



