

University of Texas Bulletin

No. 2219: May 15, 1922

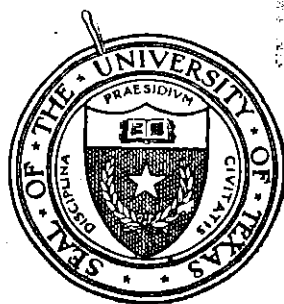
CATALOGUE

OF THE

COLLEGE OF MINES AND METALLURGY

EL PASO

1921-1922



**PUBLISHED BY
THE UNIVERSITY OF TEXAS
AUSTIN**

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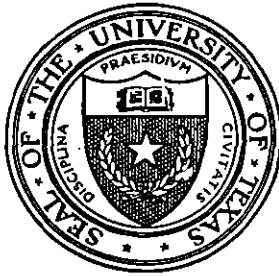
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PUBLISHED BY THE UNIVERSITY FOUR TIMES A MONTH, AND ENTERED AS
SECOND-CLASS MATTER AT THE POSTOFFICE AT AUSTIN,
TEXAS, UNDER THE ACT OF AUGUST 24, 1912

The benefits of education and of useful knowledge, generally diffused through a community, are essential to the preservation of a free government.

Sam Houston.

Cultivated mind is the guardian genius of democracy. . . . It is the only dictator that freemen acknowledge and the only security that freemen desire.

Mirabeau B. Lamar.

CONTENTS

	Page
Board of Regents.....	5
Administrative Officers.....	6
Faculty	6
Calendar	6
General Information	
History	7
Location	7
Buildings and Grounds.....	8
Policy of the College.....	8
Special Lectures.....	9
Opportunities for Self-Help.....	9
Affiliated School Scholarships.....	9
Requirements for Admission	
General Requirements.....	9
Scholarship Requirements.....	10
Subjects and Units Accepted for Admission.....	10
Methods of Admission.....	11
How to Absolve Admission Conditions.....	13
Advanced Standing.....	13
Expenses	
Fees	14
Board and Room.....	15
Regulations	
Registration	16
Definition of Credit.....	16
Amount of Work.....	16
Adding and Dropping Courses.....	16
Class Attendance and Absences.....	17
Examinations	17
Grades of Scholarship.....	18
Classification of Students.....	19
Discipline	20
Requirements for Degrees and Certificates	
Bachelor of Science in Mining Engineering.....	20
Mining Engineer.....	23
Mine Foreman's Certificate.....	23
Pit Boss Certificate.....	24

	Page
Courses of Instruction	
Chemistry	25
Economics and English.....	25
Engineering and Mathematics.....	26
Geology and Mining.....	29
Metallurgy	31
Modern Languages.....	31
Ore Tests, Assays, and Analyses	
Ore Testing Mill.....	32
Mill Run Tests on Ore.....	32
Analyses of Ores.....	33
Degrees Conferred in 1921.....	33
Register of Students.....	34

BOARD OF REGENTS

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C. E. KELLY, *Vice-Chairman*.
E. J. MATHEWS, *Secretary*, Austin.

REGENTS

Terms Expire January, 1923

C. E. KELLY.....El Paso
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Terms Expire January, 1925

FREDERICK W. COOK.....San Antonio
HENRY J. LUTCHER STARK.....Orange
H. A. WROE.....Austin

Terms Expire January, 1927

SAM P. COCHRAN.....Dallas
*H. H. HARRINGTON.....Dallas
FRANK C. JONES.....Houston
MRS. H. J. O'HAIR.....Coleman

The Board of Regents meets in Austin on the fourth Tuesday of April and October and on Commencement Day, and in Galveston in May on the day on which the graduating exercises of the Medical Branch are held.

*Resigned October 23, 1921.

COLLEGE OF MINES AND METALLURGY

ADMINISTRATIVE OFFICERS

ROBERT ERNEST VINSON, D.D., LL.D., *President.*
STEVE HOWARD WORRELL, B.S., *Dean.*
RUTH MONRO AUGUR, *Registrar.*
MRS. ALICE MORRIS, *Librarian.*
MRS. MAE PRYCE BROOKS, *Secretary.*

FACULTY

STEVE HOWARD WORRELL, B. S., *Professor of Metallurgy; Dean of the
College of Mines and Metallurgy.*
JOHN WILLIAM KIDD, B.S., E.E., *Professor of Engineering and Mathe-
matics.*
FRANKLIN HUPP SEAMON, E.M., *Professor of Chemistry.*
JULES LOUIS HENRY, *Bachelier és Lettres-Philosophe, Adjunct Professor
of Modern Languages.*
WILLIAM HENRY SEAMON, B.S., *Professor of Geology and Mining.*
EMMETT ADDIS DRAKE, M.A., *Associate Professor of English and Eco-
nomics.*
LLOYD ALVINO NELSON, M.E., *Adjunct Professor of Engineering and
Mathematics.*

BURT FRANKLIN JENNESS, M.D., *Lecturer on First Aid and Hygiene and
Sanitation.*
*ARTHUR PEARSON, B.A., *Instructor in Physics.*

RALPH DALE, *Assistant in Metallurgy.*
T. A. DOXEY, JR., *Assistant in Chemistry.*
ALBERT E. MILLAR, *Power Plant Assistant.*
TOM CLEMENTS, *Assistant in Mineralogy.*
THOMAS CROMWELL HOLLIDAY, *Physical Director.*

CALENDAR

Registration begins on September 21, continuing through September 28.

The first semester begins on September 29, and ends on January 31.
The second semester begins on February 1, and ends on May 31.

*Absent on leave for the session of 1921-1922.

The summer work in surveying (Engineering 4) begins on September 1, and lasts four weeks.

The summer work in field geology begins on September 1.

The following holidays are observed: Armistice Day, Thanksgiving Day, Christmas recess (December 23 to January 2, inclusive), Washington's Birthday, Texas Independence Day, and San Jacinto Day.

The first semester examinations are held during the last week in January. The second semester examinations for the freshman, sophomore, and junior classes are held during the last week in May; for the senior class, one week earlier.

The examinations in summer work are held on the last day of the four weeks' period in each case.

Examinations to remove conditions are held at the next regular examination period in January or May, except that conditions incurred in May may, at the discretion of the dean, be removed the following September.

GENERAL INFORMATION

HISTORY

An announcement of a course in mining appeared in the University catalogue first in 1900-1901. From then until the session of 1910-1911, an arrangement of courses leading to the degree of Mining Engineer appeared annually. The catalogue of that year contained a statement that thereafter freshmen would not be enrolled in mining, and the arrangement of courses leading to a degree in that subject was subsequently omitted.

The Thirty-third Legislature, at its regular session in 1913, passed an act creating the State School of Mines and Metallurgy, to be located at El Paso. By the terms of the act, the School of Mines was placed under the control of the Board of Regents of the University. Early in 1919, by act of the Thirty-sixth Legislature, the school was made a branch of the University of Texas.

The location of the school at El Paso was conditioned upon the donation by the city of the former Military Institute buildings and grounds. The necessary funds for this donation were secured through the activity of the Chamber of Commerce, and the school was opened in September, 1914. On October 29, 1916, the Main Building was burned. It was then decided to remove the institution to a more suitable site, on the west side of Mount Franklin, donated for that purpose. The Thirty-fifth Legislature voted an emergency appropriation of \$100,000 to erect new buildings.

LOCATION

The location of the College of Mines and Metallurgy is advantageous in several ways. The city of El Paso stands at the crossing

of several of the oldest highways established by white men on this continent. With a population of 83,000, it is the most important city, south of Denver, between San Antonio and Los Angeles. Four transcontinental railroads cross the divide at this point.

El Paso's primary resources include mining, agriculture, live-stock, and timber. The United States government is spending \$10,000,000 on a great irrigation project to provide a cheap and unfailing water supply for the Rio Grande Valley above and below El Paso.

Its extreme dryness and medium latitude, combined with a moderately high altitude (4,000 feet), give El Paso a delightful and healthful climate all the year around.

Within a radius of from one to ten miles of El Paso are found in great variety those geological formations that are usually associated with the mining industry, not only in metal mining, but in coal mining as well. In opportunity for geological study, no mining school in the United States is more favorably located.

The second largest custom smelter in the world is situated about a mile from the College of Mines and Metallurgy. It is fully supplied with equipment for the most modern methods of treating such ores as copper, lead, gold, and silver as are suitable for smelting. Students will find this an exceptional opportunity.

BUILDINGS AND GROUNDS

The campus contains twenty-three acres. There are six buildings: Main Building, two dormitories, Chemistry Building, Power House, and Mill. The Main Building contains the administrative offices, laboratories, the library, and various class rooms. The Chemistry Building contains the laboratories in chemistry and assaying. The Power House contains the heating plant and the engineering laboratory. The Dormitory contains rooms for fifty students, with shower bath and lockers for the athletic teams, a kitchen, and a dining-room. Kelly Hall contains rooms only. The Mill contains machinery for the testing of ores. All the buildings, except the Mill, are of stone, and fireproof.

POLICY OF THE COLLEGE

Emphasis will be placed on the practical or applied side of the instruction. Theory and practice must go hand in hand, so to speak, the one supplementing the other. To further this idea, no member of the faculty will be employed, unless, in addition to his collegiate training, he has had at least five years' successful experience in the practice of his profession.

A thorough mastery by the student of the details of each required

course offered will be insisted upon. In the future, as the demand may arise, supplementary courses will be offered enabling the student to specialize along various lines. It is the purpose of the College to give the student a good general education, whether he follows the practice of mining and metallurgy as his life work or not.

Athletics are encouraged, and play a prominent part in the student activities.

SPECIAL LECTURES

A series of lectures will be delivered before the Mining Club by members of the faculty and other engineers residing in El Paso. The Mining Club is an affiliated student society of the American Institute of Mining Engineers.

OPPORTUNITIES FOR SELF-HELP

To the student who is working his way, a city of the size of El Paso offers a large field of opportunity. A student's labor bureau will be maintained by the College, and every effort will be made to assist the student, but the College assumes no responsibility except to the extent of trying to help. No student should come to El Paso without funds sufficient for at least the first semester.

AFFILIATED SCHOOL SCHOLARSHIPS

The Board of Regents offers a scholarship annually to the best student among the young men and one to the best student among the young women in the graduating class of each affiliated school. These scholarships entitle the holders to exemption from matriculation fees in the College of Arts and Sciences, the School of Education, the College of Engineering, and the College of Mines and Metallurgy, so long as their conduct and standing are satisfactory to the faculty, provided they enter the University before the end of the fall term of the second session after their graduation from the high school.

REQUIREMENTS FOR ADMISSION

GENERAL REQUIREMENTS

Age. Applicants for admission must be at least sixteen years old. Applicants who seek admission by individual approval must be at least twenty-one years old.

Character. Applicants for admission must furnish evidence of good moral character. Testimonials from their latest instructors are preferred.

Vaccination. Applicants for admission must present evidence of

proper vaccination at a date sufficiently recent to insure protection against smallpox, or be vaccinated upon matriculation.

Hazing Pledge. Each applicant for admission or readmission must sign the following pledge: "I pledge myself on my honor not to encourage or participate in hazing or rushes during my attendance at the University."

SCHOLARSHIP REQUIREMENTS

For Admission without Conditions. For full admission to the College of Mines and Metallurgy fifteen units of high-school credit are required, chosen from the list below, subject to the following restrictions: (1) Three units must be presented in English; two in history, or in history and civics; two in algebra; and one in plane geometry. (2) Not more than four units may be presented in history and civics together. (3) Biology may not be presented by a student who presents either botany or zoology.

For Admission with Conditions. Until further notice, students may be admitted conditionally with only thirteen units.

SUBJECTS AND UNITS ACCEPTED FOR ADMISSION

A unit implies nine months of high-school study of five class periods a week at least forty minutes long.

English, 3 or 4	Natural Sciences:
Social Sciences:	Biology, 1
Ancient History, 1	Botany, 1
Medieval and Modern History, 1	Chemistry, 1
American History, $\frac{1}{2}$ or 1	Introduction to Science, 1
English History, $\frac{1}{2}$ or 1	Physics, 1
Civics, $\frac{1}{2}$ or 1	Physiography, $\frac{1}{2}$
Economics, $\frac{1}{2}$	Physiology and Hygiene, $\frac{1}{2}$
Mathematics:	Zoology, 1
Algebra, 2	Vocational Subjects:
Plane Geometry, 1	Agriculture, $\frac{1}{2}$ —2
Solid Geometry, $\frac{1}{2}$	Bookkeeping, 1
Trigonometry, $\frac{1}{2}$	Commercial Geography, $\frac{1}{2}$
Advanced Arithmetic, $\frac{1}{2}$	Domestic Art, $\frac{1}{2}$ —1 $\frac{1}{2}$
Foreign Languages:	Domestic Science, $\frac{1}{2}$ —1 $\frac{1}{2}$
Latin, 2, 3, or 4	Drawing, $\frac{1}{2}$ —2
Greek, 2 or 3	Manual Training, $\frac{1}{2}$ —2
German, 2 or 3	Shorthand and Typewriting, 1
French, 2 or 3	Argumentation and Debating, $\frac{1}{2}$
Spanish, 2 or 3	

METHODS OF ADMISSION

Admission must be secured in one of two ways: (1) by presenting the necessary credits, or (2) by individual approval.

I. Admission With Credits

Students may obtain credits in three ways, or by a combination of two or more of them, as follows:

(1) **By Diploma.** Graduates of approved schools are credited with the subjects they have completed in which the schools are accredited. In order to determine these credits, they are required to present statements of their work made out by the superintendent or principal on the University's official blank, to be had of the dean of the college. It is of the highest importance that the applicant send this blank, properly filled out, to the dean in advance. Valuable time will be lost if he comes to El Paso without it, and more if he has to send for it after he arrives. Without it he cannot be admitted at all.

No credit is given for work done at an accredited school unless the candidate is a regular graduate of the school.

The University of Texas has no accredited schools outside Texas but it will usually accept, for work done in a school in another state, credits granted by the state university of that state; or, in the absence of such an institution, by another institution of recognized standing acquainted with the work of the school in question.

(2) **By State Teacher's Certificate.** Applicants holding a first-grade state teacher's certificate will receive credit for eight and a half units: Three in English, two in algebra, one in plane geometry, one in ancient history, one in medieval and modern history, one-half in civics. Applicants holding a permanent state teacher's certificate will receive credit for twelve and a half units: Three in English, two in algebra, one in plane geometry, one-half in solid geometry, one-half in trigonometry, one in ancient history, one in medieval and modern history, one-half in civics, three without specification of subject.

(3) **By Examination.** Any or all scholarship requirements may be met by passing the admission examinations.

To secure credit in any subject, the applicant must make a grade not lower than D. In grading examination papers, whatever the subject, account will be taken of the applicant's use of English. Excellence in one subject will not make up for deficiency in another. Credits are not divisible in any subject.

Every natural science examination paper must be accompanied by a laboratory notebook.

Admission examinations are held twice a year, early in May and in the fall.

By agreement between certain cooperating Texas colleges and universities and the Committee on Inspection, Classification, and Accrediting of Texas High Schools, the May series of examinations are given under the direction of the State Department of Education at accredited schools and other approved centers. Application for these examinations should be made to the State Superintendent of Public Instruction, Austin.

The fall examinations are held only at the University and the College of Mines and Metallurgy.

The following are the dates and the order of the September series of admission examinations for 1922:

Monday, September 18: 9 to 12, English; 2 to 6, American History, Ancient and Medieval History, and Civics.

Tuesday, September 19: 9 to 12, English History, Modern History, and Economics; 2 to 6, Algebra and Plane Geometry.

Wednesday, September 20: 9 to 12, French, German, Latin, Spanish, and Bookkeeping; 2 to 6, Agriculture, Biology, Botany, Chemistry, General Science, Physiography, Physiology and Hygiene, Shorthand and Typewriting, and Zoology.

Thursday, September 21: 9 to 12, Solid Geometry, Trigonometry, and Commercial Geography; 2 to 6, Domestic Art, Domestic Science, Physics, and Advanced Arithmetic.

It is strongly urged that applicants desiring to enter the University in September attempt the May examinations. It is permitted to divide the subjects between the spring and fall examination periods, but credits obtained at the spring examinations lapse unless the applicant passes the deferred examinations the following fall; and credits obtained at the fall examinations, if less than the total number required, are not valid later.

II. By Individual Approval

At the discretion of the registrar of the University, an applicant over twenty-one years old may be admitted without examination, on the following conditions:

(1) He must make application on the official blank (to be had of the registrar), giving the information there desired.

(2) He must furnish evidence that he has substantially covered the ground of the units required of other candidates, and that he has sufficient ability and serlousness of purpose to do the work desired with profit to himself and to the satisfaction of the University.

(3) He must show, by the writing of a composition, that he has an adequate command of English.

Applicants are advised to send their applications and credentials in advance of their coming to El Paso.

Admission by individual approval contemplates applicants who have

not recently attended school and are not, therefore, in a position to pass the admission examinations.

Students so admitted may register for courses other than freshman courses only with the approval of the dean, given because of evidence of special fitness.

Neglect of work or other evidence of lack of serious purpose on the part of a student thus admitted will cause the withdrawal of the dean's approval, thus severing the student's connection with the University, and preventing his readmission until he has satisfied all admission requirements.

Students admitted by individual approval *can not become candidates for degrees until they have satisfied the admission requirements.* As to how to remove admission conditions, see the following section.

HOW TO ABSOLVE ADMISSION CONDITIONS

Admission conditions may be removed (1) by taking with the approval of the dean the regular admission examinations in subjects not studied by the student in the University; (2) by counting work done in the University. The prescribed admission units must be *satisfied* by work in the corresponding subjects in the University; the elective admission units may be absolved by any University work. In satisfying admission conditions, a course counts as the equivalent of one and one-half units. Courses used to absolve admission requirements will not count toward a degree. If a student does not satisfy his admission conditions within two years after admission, he must present one additional unit for each year that his conditions remain unsatisfied. Conditions may not be removed by taking admission examinations later than two years after admission. After that time, they may be removed only by work done in the University.

Students admitted by individual approval to English 1 will, on completing that course, be given credit also for three admission units in English. Similarly, students admitted to *Mathematics 1* will, on completing that course, receive credit also for two admission units in algebra and one in plane geometry. Further, students admitted by individual approval and making, during their first long session, with an average grade of C. not less than thirty credit hours of the regularly prescribed work of the freshman class, will in addition absolve all admission conditions in free elective units.

ADVANCED STANDING

Students from Secondary Schools. Applicants who, in addition to satisfying the admission requirements, wish to obtain advanced standing in any subject, must secure, by examination or otherwise, the consent of the dean of the College.

Students from Other Colleges. A student seeking admission from another college must present: (1) A letter of honorable dismissal; (2) a vaccination certificate; (3) a catalogue of the college from which he comes; (4) a full statement of the work he has done, including the work credited at entrance. This statement must be made out on the University's official blank (to be had of the dean), and must be duly certified by the authorities of the student's college. Much trouble and time will be saved if the blank is filled out and certified in advance of the student's coming to El Paso. Students are not allowed to register until the proper certificates are presented.

All credits given students from other colleges are conditional. If their work here is of a low grade, the amount of credit given to individual students may be reduced.

Like other applicants for admission, students from other colleges must sign a pledge to do no hazing.

EXPENSES

FEEES

Matriculation Fee. Each student will pay at the beginning of each session an annual matriculation fee of ten dollars, until thirty dollars have been paid. If any part of the total amount has been paid in any other branch of the University, that part is not again required in the College of Mines and Metallurgy.

Laboratory Fees. Students who take laboratory courses are required to pay a fee to cover in part the cost of the material consumed. In certain subjects, a deposit also is required to cover breakage of apparatus. Certificates of payment of these fees and deposits must be presented by the students to their instructors before they can be assigned to desks in the laboratories or enrolled in their classes.

The following table shows the fees and deposits due in the several subjects:

LABORATORY FEES AND DEPOSITS

Subject	Fee	Deposit	Total	Subject	Fee	Deposit	Total
Chemistry 1.....	\$ 10.00	\$ 5.00	\$15.00	Mechanics	\$ 3.00	\$ 3.00	\$ 6.00
Chemistry 2.....	12.00	8.00	20.00	Field Geology.....	5.00	-----	5.00
Chemistry 3.....	15.00	5.00	20.00	Mineralogy	5.00	5.00	10.00
Chemistry 4.....	5.00	5.00	10.00	Mill Work Course	-----	-----	-----
Chemistry 5.....	5.00	5.00	10.00	in Ore Testing.....	5.00	-----	5.00
Drawing	2.00	2.00	4.00	Summer Surveying..	2.00	-----	2.00
Physics	3.00	3.00	6.00				

Each student is required to furnish his own drawing instruments, which cost from fifteen to twenty dollars.

In the summer courses in surveying, the student will be required to pay for any damage to instruments arising from causes other than

ordinary wear and use, which are covered by the two-dollar laboratory fee.

Diploma Fee. A diploma fee of five dollars is payable not later than March 1 by each candidate for a degree the following May.

Delayed Registration Fee. A student who registers after the last registration day of any semester is required to pay a delayed registration fee of three dollars.

Student Association Fee. The Student Association fee is \$10.00 a year. This fee covers the student activities, social and athletic, and also provides for the school paper, *The Prospector*, which is published by the student body.

Repayment of Fees. If a student is allowed to drop a laboratory course, one-half of the fee will be refunded for each semester not begun. In no case will the fee be returned for a semester the work of which has been begun.

The matriculation fee is not returnable.

The diploma fee will be returned only in case the student withdraws from candidacy for the degree before the diploma is made out. The fee is barely sufficient to cover the cost of the diploma, and, as all undelivered diplomas are destroyed, it must be paid over again if the student makes another application for the degree.

No fee holds over from one year to another.

BOARD AND ROOM

The College of Mines and Metallurgy maintains two dormitories and a dining-hall. Board cost twenty-six dollars a month the past year. The rate for the coming session will be based upon the cost of supplies. The corner rooms rent for eight dollars a month, the other rooms for six dollars. As the demand for dormitory rooms is large, while the number of rooms is limited, it is expected that two students will occupy a room and share the rent between them.

The rooms are heated by hot water, lighted by electricity, and furnished. Each student must provide his own mattress (for single bed), pillows, blankets, and bed linen.

Each student is held responsible for any damage to his room or its contents, whether caused by him or not. A dormitory breakage deposit of five dollars is required, which is returned if no damage is done to the furniture, building, or fixtures.

Board and room rent must be paid in advance on the first day of each month. A fine of fifty cents a day is charged for each day the student is delinquent.

Rooms will be assigned in the order of application, preference being given to students who are occupying rooms during the current session, provided their applications are received before May 31 and accompanied by a deposit equal to one-half the monthly rental of the rooms

for which application is made. All new applications must be accompanied by a deposit of three dollars in order to be considered. Rooms thus reserved will be held only until September 29th unless special notice is given of delayed arrival.

REGULATIONS

REGISTRATION

Students are required to register in person for each semester. Those who register after the appointed dates will be required to pay a fine of three dollars.

After the twelfth working day of any semester, students will be allowed to enter only if, in addition to fulfilling the admission requirements, they pass satisfactory examinations upon the back work of the subjects they desire to take.

DEFINITION OF CREDIT

An hour of credit implies one classroom hour a week for one semester. Three hours of laboratory work are counted as equivalent to one hour of recitation or lecture. Thus, a course consisting of three lectures or recitations a week for one semester is rated as a three-credit subject; one consisting of three lectures or recitations and three laboratory hours a week for one semester, as a four-credit subject.

AMOUNT OF WORK

Freshmen may not register for more than eighteen credit hours for each semester; sophomores and juniors for more than twenty credit hours; seniors for more than twenty-one credit hours, except by vote of the faculty.

Students who expect to become candidates for a degree may carry not less than twelve credit hours for each semester.

ADDING AND DROPPING COURSES

After his registration for the session, a student may add a subject only with the approval of the dean. No subject may be added, however, after the twelfth working day of any semester.

For weighty cause, a student may drop a subject with the consent of the dean. To drop a subject without permission means to sever one's connection with the University.

On the recommendation of the instructor concerned, approved by the dean, a student may at any time be required to drop a course because of neglect, or for lack of preparation.

CLASS ATTENDANCE AND ABSENCES

Absence from Class. Uniform and punctual attendance upon all exercises at which the student is due is strictly required. Absences are sometimes unavoidable, and a reasonable allowance is made for such possibilities. A student, however, who is absent unexcused during any semester from any subject for more than one-tenth of the total number of exercises in that subject, is dropped from the University rolls for the remainder of the session. Late registration and the payment of a delayed registration fee do not exempt a student from accountability for absences before registration.

When dropped from the University rolls for excessive absences in a particular subject, the student may, unless he obtains the dean's permission to drop the course, gain readmission only by passing a special examination in the subject at a date fixed by the dean and the instructor concerned.

For prolonged absence due to illness, a student may be excused on application to the dean. A statement from the attending physician must be presented as evidence of the student's incapacity.

If a student is compelled to be absent from his work on account of business, he should apply to the dean for a temporary withdrawal. No repayment of fees is permissible, but, his instructors being notified, he is not reported absent from his classes. In order to be readmitted to his classes for the remainder of the session, the student must, within two weeks after his return, pass special examinations in all his subjects covering the work missed during his absence. In every case of temporary withdrawal, the parent or guardian is notified.

Absence from Quiz. A student absent from an hour examination or quiz is graded zero on that quiz, unless for urgent reason he is given by the instructor the privilege of taking a postponed examination at a time to be set by the latter.

Tardiness. Serious or repeated tardiness will be considered as equivalent to absence, and reported as such.

Failure to Hand in Themes, Reports, Etc. Themes, reports, etc., not handed in at the time appointed may be received only in case the delay was due to imperative cause satisfactory to the instructor.

EXAMINATIONS

Term Examinations. The object of examinations being primarily not to find out how much the student knows, but to lead him to secure a general view of the whole subject and readiness in the use of it, the faculty has ruled that exemptions from examinations may not be given. To encourage preparation for examination, the faculty has further ruled that during the last seven days of each semester before examinations

no written examination or review shall be given; and all essays, theses, synopses, and the like, must be handed in before this period begins.

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.

Absence from Term Examinations. A student who is compelled to be absent from a term examination on account of sickness or other imperative cause should petition the dean, beforehand if at all possible, for permission to postpone the examination. If this permission is granted, the postponed examination may be taken within a year on any of the dates appointed therefor, provided the student petitions the dean on or before the seventh day preceding the first day of the examination period.

A student absent from a term examination without the dean's excuse is graded F or G, and required to take the term's work over again if he desires credit for it.

Postponed, Advanced Standing, and Condition Examinations. Postponed and advanced standing examinations and examinations for the removal of conditions are held at the regular examination periods in January and May. Applications for these examinations must be made to the dean on or before the seventh day preceding the first day of the examination period. Conditions received in the second semester may, at the discretion of the dean, be removed by a second examination the following September.

A student who fails to pass a condition examination in any subject forfeits thereby the right to ask for another examination in that subject. Absence from an examination, after once a permit has been granted, will have the same effect as failure, unless the student presents to the dean within a week after the date set for the examination a satisfactory excuse for his absence.

Term Reports. Reports are sent out to parents and guardians at the end of each term for all students. Self-supporting students over twenty-one years of age may receive their reports instead of their parents, if they request it in writing.

GRADES OF SCHOLARSHIP

Grades. The standing of a student in his work is expressed by grades made up from class work and from examinations. There are seven grades: A (excellent), B (good), C (fair), D (pass), E (failure), F (bad failure, with privilege to continue the course), G (the same as F, except that the student may not continue the course). To pass in a course, it is necessary to secure a grade of at least D both on class work and on term examination, considered separately. Grades

are given by semesters, but no subject will count toward a degree until credit has been received for all the semesters covered by it.

Mid-Term Reports. About the middle of each semester, reports are sent out for students doing work below the passing grade (D) both to the students themselves, and to their parents or guardians.

Effect of a Term Grade of E. A student who fails to pass in a course but makes a grade of E is called "conditioned," and is allowed opportunity to remove the condition by a second examination at the next regular examination period, or the following September, at the discretion of the dean, in case the condition is received in the second semester.

In a subject continuing beyond one semester, the instructor may, by sending to the dean the proper credit notice, raise an E of an earlier semester to D because of good work done in a later semester; but no grade may be altered later than six months after it was handed in, unless further work has been done in the course in the meantime.

Effect of a Term Grade of F. A student who receives a grade of F for any term, whether by reason of poor work, or absence from the term examination without excuse from the dean, may continue the course; but he may not obtain credit for the term in which he failed without repeating the work of that term in class.

Effect of a Term Grade of G. A student who receives a grade of G for any term, whether by reason of poor work, or absence from the term examination without excuse from the dean, is dropped from the subject, and must, if he desires to obtain credit for it, take that term's work over again in class.

Higher Work after Failure. If a student makes an F or a G in a course, he may not take up a higher course in the same subject until the course is taken again. If a student makes an E in a course, he may take up a higher course in the same subject only with the written consent of the instructor concerned, approved by the dean.

CLASSIFICATION OF STUDENTS

Students are classified as regular and irregular. Under *Regular Students* are grouped those taking twelve or more hours of work prescribed for a degree. Under *Irregular Students* are grouped those taking less than twelve credit hours.

Regular students are divided into freshmen, sophomores, juniors, and seniors. Until the completion of thirty credit hours of prescribed work in addition to the full admission requirements, they are freshmen; then, until sixty-five credit hours are completed, sophomores; then, until one hundred credit hours are completed, juniors; then seniors until graduation.

DISCIPLINE

Students are trusted to conduct themselves properly. If, however, it becomes apparent that any student, by misconduct or by neglect of studies, is doing harm to himself or to others, the faculty will use all appropriate means of discipline. The following penalties may be resorted to: Admonition, probation, suspension, and expulsion.

The penalties mentioned above will not necessarily be inflicted in regular gradation, but any one will be imposed as the circumstances demand.

The University has been remarkably free from such evils as hazing and class rushes; and, in order to insure the continuance of this desirable condition, the faculty has specially forbidden rushes, and announced that students engaging in, instigating, or encouraging them, will be liable to suspension.

Probation. Probation is of two kinds, disciplinary and scholastic. It will be for a definite period, during which the student, while still in attendance upon his classes, must show marked improvement in conduct or in studies, or in both, in default of which his connection with the University will terminate with the period.

A student on probation who absents himself from any class exercise, or neglects any class work, except for reasons considered imperative by the dean, will thereby drop his name from the University rolls for the remainder of the session.

Absences and neglect on the part of such student, not explained to the dean within one day—beforehand, if possible—will be presumed to be without excuse and will effect the dropping above mentioned.

Suspension. Suspension will be for a definite period, during which the student will not be allowed within the University or upon its grounds, and may be required to satisfy special conditions.

Expulsion. Expulsion is the severest penalty, and is final separation from the University. No student, however, will be expelled except after a full hearing and by a vote of the faculty.

REQUIREMENTS FOR DEGREES AND CERTIFICATES**BACHELOR OF SCIENCE IN MINING ENGINEERING**

The completion of the following four-year curriculum leads to the degree of Bachelor of Science in Mining Engineering.

First Year**First Semester**

SUBJECT AND NUMBER OF HOURS A WEEK	NUMBER OF CREDITS
Algebra	} 3
Trigonometry	
English, 3	3

REQUIREMENTS FOR DEGREES AND CERTIFICATES

21

SUBJECT AND NUMBER OF HOURS A WEEK	NUMBER OF CREDITS
Drawing, 9 hours draughting room.....	3
Chemistry, 3 lectures, 3 hours laboratory.....	4
Spanish.....	3
	—
	16

Second Semester

Trigonometry	}	3.....	3
Analytical Geometry			3
English, 3.....			3
Drawing, 6 hours draughting room.....			2
Chemistry, 3 lectures, 6 hours laboratory.....			5
Spanish.....			3
Surveying, 2.....			2
			—
			18

Summer Work in Surveying:

Eight hours a day for four weeks.....	3
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Second Year

First Semester

Mine Surveying, 1 lecture.....	1
Calculus, 4 lectures.....	4
Analytical Chemistry, 9 hours laboratory.....	3
Geology, 3 lectures.....	3
Mineralogy, 2 lectures, 3 hours laboratory.....	3
Physics, 3 lectures, 3 hours laboratory.....	4
	—
	18

Second Semester

Applied Mechanics, 4 lectures.....	4
Air Compression, 2 lectures.....	2
Geology, 3 lectures.....	3
Mineralogy, 2 lectures, 3 hours laboratory.....	3
Analytical Chemistry, 9 hours laboratory.....	3
Physics, 2 lectures, 3 hours laboratory.....	3
	—
	18

Summer Work in Field Geology:

Eight hours a day for four weeks.....	3
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Third Year

First Semester

Assaying, 3 hours laboratory.....	1
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SUBJECT AND NUMBER OF HOURS A WEEK	NUMBER OF CREDITS
Graphic Statics, 2 lectures, 3 hours laboratory.....	3
Engineering Laboratory, 3 hours.....	1
Mining Methods, 3 lectures.....	3
Ore Deposits, 3 lectures.....	3
Smelting, 3 lectures.....	3
Electricity Applied to Mining and Metallurgy, 3 hours.....	3
	—
	17
Elective:	
English 2, 3 ¹ lectures.....	3

Second Semester

Assaying, 3 hours laboratory.....	1
Hydraulics, 2 lectures.....	2
Thermodynamics, 2 lectures.....	2
Engineering Laboratory, 3 hours laboratory.....	1
Mining Machinery, 3 hours, lectures.....	3
Petrology, 2 lectures, 3 hours laboratory.....	3
Smelting, 3 lectures.....	3
Electricity Applied to Mining and Metallurgy, 3.....	3
	—
	18
Elective:	
English 2, lectures.....	3

Fourth Year

First Semester

Chemistry 5, 3 hours laboratory.....	1
Ore Dressing, 2 lectures, 3 hours laboratory.....	3
Economics, 3 lectures.....	3
Mine Management, 1 lecture.....	1
Leaching of Ores, 3 lectures.....	3
Oil and Gas Mining, 3.....	3
Mill Work, 3 hours laboratory.....	1
Chemistry and Mineralogy of the Rare Minerals, 3 hours lab.	1
First Aid, 1.....	1
Mining Law, 1.....	1
	—
	18

Second Semester

Ore Dressing, 2 lectures, 3 hours laboratory.....	3
Economics, 3.....	3
Leaching of Ores, 3.....	3

REQUIREMENTS FOR DEGREES AND CERTIFICATES 23

SUBJECT AND NUMBER OF HOURS A WEEK	NUMBER OF CREDITS
Coal Mining, 2; or Railway Surveying.....	2
Chemistry of the Rare Minerals, 3 hours laboratory.....	1
Mill Design, 1.....	1
Practice Mine, 3 hours laboratory.....	1
Accounting, 3.....	3
Mine Management, 1 hour.....	1
	18

MINE ENGINEER

The degree of *Mining Engineer* will be conferred upon graduates of the College of Mines and Metallurgy who have done at least two years of successful professional work in mining or metallurgy subsequent to receiving the bachelor's degree and have presented an acceptable thesis.

MINE FOREMAN'S CERTIFICATE

To meet the demand for special instruction for coal-mine foremen, the *Mine Foreman's Certificate* is offered. This certificate requires one year's attendance and covers fully the proposed course recommended by the State Mining Board. The mathematics is covered by *Mathematics A*, a special outline of the subject planned specifically for this course. The work in geology, physics, and coal mining is the same as that offered as *Geology 1*, *Physics 1 and 2*, and *Coal Mining*. The course in *Economics of Mining* will be a briefer course than that offered under that head in "Mining." No special scholastic admission requirements will be demanded, except a common-school education and sufficient maturity. No student will be admitted who does not present a statement signed by former employers certifying to at least two years' actual working experience in a coal mine. This statement will be filed for record with the student's registration card. A certificate will not be issued unless the student, upon the completion of his course, is twenty-one years of age or over. The cost of the course is the registration fee and the laboratory fee in physics.

COURSE OF INSTRUCTION

(ATTENDANCE REQUIRED)

Subjects	FIRST SEMESTER	Hours a Week
<i>Mathematics</i>		3
<i>Geology 1</i>		3
<i>Physics</i>		4

Subjects	Hours a Week
Mining Methods.	3
First Aid to the Injured and Mine Rescue Work.	1

SECOND SEMESTER

Mathematics and Surveying.	3
Geology 1.	3
Physics.	3
Coal Mining.	3
Economics of Mining (Special Course).	1

PIT BOSS CERTIFICATE

There are in every coal mining section of Texas and the Southwest ambitious men who desire better training to fit them for their occupation as coal miners, but for whom a year at college is practically impossible. For the benefit of these men, the College of Mines and Metallurgy offers a special reading course leading to a Pit Boss Certificate. The subjects covered are practical mathematics, mining methods, mining equipment, transportation methods, mine organization and safety, boilers, engines, elementary economics, etc. On receipt of a dollar and a half as a registration fee, printed instructions will be sent. The student will pay for his own books. As each section of the work is completed, a short set of examination questions and problems will be sent. On completion of the whole course, a final examination will be sent to the student's county superintendent of schools to be taken under his direction. On receipt of the student's answers, with the county superintendent's signed statement that the examination has been properly conducted, the student will be given a Pit Boss Certificate, provided he has correctly answered at least seventy-five per cent of the questions, is at least eighteen years old, and has had at least twelve months in actual coal-mine work. The only preparation necessary to carry on this work successfully is an elementary education; that is, the ability to read and write English easily. A student under eighteen will not be accepted unless he has had one year in high-school work.

COURSE OF INSTRUCTION

(ATTENDANCE NOT REQUIRED)

Practical Mathematics, Palmer, Parts 1, 2, and 3.
 Mining Methods and Shaft-Sinking.
 Mining Equipment, Management, and Ventilating Equipment.
 Boilers and Engines.
 Elementary Economics.

COURSES OF INSTRUCTION

CHEMISTRY

PROFESSOR F. H. SEAMON

1. *General Inorganic Chemistry*.—The laws and theories of chemistry, with a study of the more important elements and their compounds with special reference to their production and industrial uses. Three hours, both semesters; three credits.

1a. *Laboratory Course*.—Laboratory processes; preparation and properties of gases; simple inorganic preparations and experiments in general chemistry; chemical problems. One afternoon, first semester; one credit.

1b. *Qualitative Analysis*.—A detailed study of pure salts and of various complex ores. Two afternoons, second semester; two credits.

NOTE.—Courses 1, 1a, and 1b, although listed separately, form one integral course. The laboratory courses must be taken with the class work.

2. *Analytical Chemistry*.—Gravimetric analysis of pure chemical salts; acidimetry and alkalimetry; volumetric analysis covering all classes of work usually done in a mine or smelter laboratory. Prerequisite: Chemistry 1. Three laboratory periods, both semesters; six credits.

3. *Assaying*.—The determination of gold, silver, lead, and tin, by furnace methods, in ores and mill and smelter products. Prerequisite: Chemistry 2. One laboratory period, both semesters; two credits.

4. *Chemistry and Mineralogy of the Rare Minerals*.—A course in advanced mineral analysis. Prerequisite: Chemistry 2. One lecture or laboratory period, first and second semesters; two credits.

5. *Electrochemical Analysis*.—An elective course designed to give the student a practical knowledge of the electrochemical methods of analysis and the more common chemical reactions which take part under the influence of the electric current. Prerequisite: Chemistry 2. One lecture or laboratory period, first semester; one credit.

ECONOMICS AND ENGLISH

ASSOCIATE PROFESSOR DRAKE

Economics

1. *Principles of Economics*.—A general introduction to the principal branches of economic theory and to current economic problems. Emphasis is placed upon money and banking, international trade, labor, taxation, trusts and combinations, and railroads, and special emphasis

upon economic problems as related to the mining industry. Three hours, both semesters; six credits. Associate Professor DRAKE.

2. *Accounting*.—A study of the technic of accounts; analysis of the balance sheet and income statement; a study of costs, charges upon investment, reserves, sinking funds, maintenance, depreciation, salvage values, and similar subjects. Open only to seniors. Three hours, second semester; three credits. Associate Professor DRAKE.

English

1. *Composition and Rhetoric*.—A study of the rhetoric of the whole composition, of the paragraph, and of the sentence, and the analysis of masterpieces of English prose, with abundant practice in writing. Three hours, both semesters; six credits. Associate Professor DRAKE.

2. *English*.—A general survey of English literature from the early Anglo-Saxon period to the present time. This includes a study of masterpieces in both prose and poetry. Original essays are required from students each term. Prerequisite: English 1. Three hours, both semesters; six credits.

ENGINEERING AND MATHEMATICS

Drawing

PROFESSOR KIDD; ADJUNCT PROFESSOR NELSON; INSTRUCTOR PEARSON*

1. *Mechanical Drawing*.—The course includes lettering, geometrical constructions, isometric projection, sketching of machine parts, complete working drawings from sketches and copy, tracing, and blue-printing. Three afternoons, first semester; two afternoons, second semester; five credits. Adjunct Professor NELSON.

Engineering

1. *Physics: Mechanics and Heat*.—The course includes a thorough grounding in kinematics, dynamics, statics, kinetics, properties of matter; thermometry, and expansion. Particular attention is given to composition and resolution of forces, accelerations, and velocities, to simple harmonic motion, and to the moment of inertia. Three recitations and one laboratory period, first semester; four credits.

2. *Physics: Heat, Electricity, and Magnetism*.—A continuation of Physics 1. The subjects treated are calorimetry, heat and work, change of state, vaporization, condensation of gases, radiation, magnetism, the magnetic field, magnetic induction, electrostatics, electrodynamics, and radioactivity. Two recitations and one laboratory period, second semester; three credits.

*Absent on leave for the session of 1921-1922.

3. *Plane Surveying*.—The theory of plane surveying, including the care and adjustment of instruments; land surveying; traverses; leveling; determinations for meridian; topographic surveying; mapping; the different systems of note keeping; and the usual computations used in plane surveying. Prerequisite: Satisfactory work in Mathematics 2. Two hours, second semester; two credits. Adjunct Professor NELSON.

4. *Field Surveying*.—A practical field course covering the topics outlined in the preceding course. Accurate and rapid work will be insisted upon. Prerequisite: Engineering 3. Eight hours a day during September; three credits. Adjunct Professor NELSON.

5. *Mine Surveying*.—Underground surveying, mapping of underground connections, surface surveying in connection with mineral claims, and all ordinary surveying operations that the mining engineer may be called upon to perform. Prerequisite: Engineering 4. One hour, first semester; one credit. Adjunct Professor NELSON.

6. *Thermodynamics*.—A study of the fundamental equations of gases, and their application to the steam engine; the heating values of different fuels; the practical construction and operation of steam boilers; boiler feed pumps; methods of firing boilers; different types of steam engines as regards speed, valves, steam consumption, comparative cost, and relative economy; actual adjustment of valves, and determination of horsepower, by the use of the indicator; steam turbines; and a large number of practical problems. Prerequisite: Mathematics 4. Two hours, first semester; two credits. Professor KIDD.

7. *Air Compression*.—The fundamental definitions and equations; the flow through orifices; the flow through pipe lines; the effect of temperature; and theoretical considerations. Prerequisite: Mathematics 4 and Engineering 1. Two hours, second semester; two credits. Professor KIDD.

8. *Hydraulics*.—A brief course in hydrostatics; fluids in motion; flow of liquids through pipes; orifices, and over weirs; fluid friction and loss of head; Bernoulli's theorem; flow of water in canals and rivers; Kutter's formula; and graphical methods. Prerequisite: Mathematics 4 and Engineering 1 and 2. Two hours, second semester; two credits. Professor KIDD.

9. *Applied Mechanics*.—Center of gravity, moment of inertia, radius of gyration; bending moments; shear; torsion; resilience; flexure of beams; theory of long columns; strength of materials. Prerequisite: Mathematics 4 and Engineering 1. Four hours, second semester; four credits. Professor KIDD.

10. *Graphic Statics*.—The funicular polygon; moment diagram; shear diagram; determination of stresses in various types of roof and bridge trusses; completed designs in steel and timber; comparisons as to weight and cost. Prerequisite: Drawing 1 and Engineering 9.

Two recitations and one laboratory period, first semester; three credits. Professor KIDD.

11. *Engineering Laboratory*.—A laboratory course to supplement the instruction given in thermodynamics, air compression, hydraulics, and applied mechanics. Prerequisite: Engineering 9. This course must accompany Engineering 7 and 8. One afternoon, both semesters; two credits. Professor KIDD.

12. *Electricity Applied to Mining*.—Mine signalling; mine haulage; lighting; hoisting; wiring installations; pumping; comparisons of direct with alternating current for various uses in mining work. Prerequisite: Mathematics 3 and Engineering 2. Three hours, both semesters; six credits. Professor KIDD.

13. *Railway Surveying*. Exercises in simple, reverse, transition curves; turnouts; cross-sections; and estimates. Prerequisite: Open to seniors as an elective. Two recitations, second semester; two credits. Professor KIDD.

Mathematics

A. *Solid Geometry*.—A course in solid geometry for students deficient in entrance credits. Three hours, first semester; one-half unit entrance credit. Adjunct Professor NELSON.

1. *College Algebra*.—A rapid review of quadratic equations; radical expressions; logarithms; choice; chance; series; the binomial theorem; and the theory of limits. Prerequisite: Entrance credit in algebra and plane geometry. Three hours for eleven weeks, first semester; two credits. Adjunct Professor NELSON.

2. *Plane Trigonometry*.—The general formulas of plane trigonometry; inverse functions; identities; trigonometric equations; goniometry; solution of triangles; and proficiency in the use of the tables. Prerequisite: Mathematics 1. Three hours, one-third of the session; two credits. Adjunct Professor NELSON.

3. *Analytic Geometry*.—Cartesian coördinates of the point; polar coördinates; graphs of algebraic and transcendental functions; loci in general; and a careful consideration of the plane curves. Prerequisite: Mathematics 2. Three hours, one-third of the session; two credits. Adjunct Professor NELSON.

4. *Calculus*.—In differential calculus, special attention is given to the derivation of formulas and to the application of derivatives to the solution of problems in maxima, minima, rates, velocity, acceleration, and geometrical applications. The work in integral calculus drills the student in the integration of forms occurring in mechanics and physics; in evaluating areas, moments, moments of inertia, and volumes, in finding the center of gravity and center of stress; and in the derivation and application of the fundamental formulas of hydrostatics and hydraulics. Prerequisite: Mathematics 3. Four hours, first semester; four credits. Professor KIDD.

GEOLOGY AND MINING

PROFESSOR W. H. SEAMON

LECTURER B. F. JENNESS

Geology

1. *Physical Geology*.—A careful study of the facts and principles of dynamic and structural geology. Prerequisite: Chemistry 1 and Physics 1. Three hours, first semester; three credits.

2. *Historical Geology*.—The history of the earth as preserved in its strata with elementary instruction in geologic mapping and making geological sections. Prerequisite: Physical Geology 1. Three hours, and three afternoons during second semester; three credits.

3. *Field Geology*.—A summer course lasting four weeks is given each year during the month of September. A camp at some suitable place is selected and the area is carefully mapped and all of the geological features marked. Plane tables, transits and the Army Sketch Boards are used in mapping. Students provide their own bedding and bear their proportion of the camp expenses for food and transportation. Last year's camp was conducted at a cost of one dollar a day, but the expense for railway transportation is not included as it varied with each individual student. This course is required of all candidates for a degree who have credits in Geology 1 and 2 and Mineralogy 5 and 6; three credits.

4. *Ore Deposits*.—An exhaustive study of the occurrence and origin of all of the useful deposits of gold, silver, lead, copper, zinc, tin, iron, nitrates, salts, gypsum, clays, cement materials, coal, petroleum and natural gas is made. Prerequisite: Geology 1 and 2 and Mineralogy 5 and 6. Three hours, first semester; three credits.

5. *Mineralogy*.—This course is designed to familiarize the student with all of the ore minerals and the most common rock making minerals. Only the elements of crystallography are taught, but much attention is given to the study of descriptive mineralogy and the frequent and regular handling of minerals. Prerequisite: Chemistry 1, 1a and 1b. Two hours, both semesters; four credits.

6. *Determinative Mineralogy*.—Each student is required to determine the species of two hundred different and important minerals using streak plate, scale of hardness and the ordinary blowpipe tests employed in such work. This course must be taken in conjunction with Mineralogy 5. Three hours of laboratory work, both semesters; two credits.

7. *Petrology*.—The design is to qualify the student to recognize in the field the important rocks connected with ore deposits and their chief identification minerals so far as that can be done with the limited testing facilities available on such occasions. The student handles

a large and varied collection of type specimens in connection with the lecture work on descriptive petrology. Some knowledge of the methods employed in petrography is secured by study of a collection of 150 thin sections of type rocks with a microscope, and the student is required to make at least one good thin section of a rock specimen for study under microscope. Prerequisite: Chemistry 1, 1a, 1b and Mineralogy 5 and 6. Three hours, second semester; three credits.

Mining

1. *Mining Methods*.—Prospecting, exploration, development, exploitation, explosives, breaking ground, drifting, stoping, timbering, drainage and ventilation of mines, metal and coal. Prerequisite: Completion of courses in chemistry, physics, mineralogy and geology. Three hours, first semester; three credits.

2. *Mining Machinery*.—The methods employed in rock and placer mining are studied with reference to the various forms of machines employed in such operations. Prerequisite: Mining 1. Three hours, second semester; three credits.

3. *Coal Mining*.—The extraction, cleaning and marketing of coal and the manufacture of coke and collection of all the by-products are considered. Prerequisite: Mining 1. Two hours, second semester; two credits. This is an elective course.

4. *Oil and Gas Mining*.—This course is an exhaustive study of the origin, distribution, migration, and accumulation of oil and gas. The methods of locating oil and gas wells, the drilling of same, bringing wells in, their management; piping, transportation and refining of oil are also considered; marketing and valuation of oil properties are studied; the possibilities of development in utilization of oil shales are considered. Prerequisite: Geology 1, 2 and 3. Three hours, first semester; three credits.

5. *Practice Mine*.—Practical instruction in driving tunnel, sinking shaft, use of machine drill, timbering and use of explosives is given on the school campus. The course must be taken in conjunction with Mining 1 and 2, and is given one afternoon a week during the second semester; one credit.

6. *Mine Management*.—Mine examination, sampling, reporting, welfare, financing and other interesting problems are considered in a lecture course given only to students of senior standing. One hour, both semesters; two credits.

7. *Mining Law*.—The principles governing contracts, liabilities of mine operators, compensation and insurance of workmen and the laws and court decisions of the United States, Texas, and Mexico so far as they relate to locations and acquirement of titles to mines are carefully considered in a course of lectures given to seniors. One hour, first semester; one credit.

8. *First Aid and Rescue Work*.—Prerequisite: Mining 1 and 2. One hour, first semester; one credit. Lecturer JENNESS.

9. *Hygiene and Sanitation*.—Prevention of communicable diseases, personal hygiene, public hygiene, food, air, water, soil, ventilation and heating, sewage disposal, disinfection, camp sanitation, mine sanitation, prevention of occupational diseases. Elective, open to junior and senior students. Two hours, both semesters; four credits. Lecturer JENNESS.

METALLURGY

PROFESSOR WORRELL

1. *Metallurgy of Smelting Processes*.—An introductory course in general metallurgy, followed by a detailed study of copper and lead smelting. Prerequisite: Chemistry 2. Three hours, both semesters; six credits.

2. *Metallurgy of Leaching Processes*.—A study of the chemical and physical properties of the precious metals and of such of their compounds as are of importance in connection with the leaching processes; the cyanide process; chlorination; hyposulphite leaching and the Russell process, etc. Prerequisite: Chemistry 2. Three lectures, both semesters; six credits.

NOTE.—The course in assaying must either precede Metallurgy 1 and 2 or be taken at the same time.

3. *Ore Dressing and Milling*.—A study of the principles of amalgamation, concentration, and ore dressing. Two lectures and one laboratory period, both semesters; six credits.

4. *Mill Design*.—A course in laying out flow sheets and in designing plants from data obtained in the preceding course. Lectures and laboratory, second semester; one credit.

MODERN LANGUAGES

ADJUNCT PROFESSOR HENRY

French

1. *Elementary French*.—The essentials of grammar, with exercises in speaking and writing. Reading of easy modern stories and plays. Three hours, both semesters; six credits.

2. *Second-Year French*.—Rapid reading of modern fiction and drama, with practice in speaking. Three hours, both semesters; six credits.

German

1. *Elementary German*.—Grammar, reading and writing of easy German. Three hours, both semesters; six credits.

2. *Second-Year German.*—A continuation of the work in German 1. Three hours, both semesters; six credits.

Spanish

1. *Conversational Spanish.*—Three hours, both semesters; six credits.
2. *Second-Year Spanish.*—Rapid reading of modern fiction and drama, with practice in speaking. Three hours, both semesters; six credits.

ORE TESTS, ASSAYS, AND ANALYSES

ORE TESTING MILL

An appropriation was made by the Thirty-fourth Legislature for the erection of a mill for ore-treating at the College of Mines and Metallurgy. This mill is now completed. The construction has followed a definite idea, that idea being a mill for continuous operation and flow of ore as far as possible. The basis of capacity is two hundred pounds of ore an hour, and lots of less than a thousand pounds will not be treated. No "miniature plants" have been installed, nor any machine whose normal capacity under full loads is in excess of two hundred and fifty pounds an hour.

MILL RUN TESTS ON ORE

Mill run tests on ore will be made free of charge to mine owners desiring tests for process of treatment, regardless of the location of the mine, whether within or without Texas. The mine owner will be required to prepay all freight charges and the cost of the necessary assays. This work will be done by students under the personal direction of the professors in charge of the work, and will be carefully checked to insure that the work is accurate for the lot tested. Beyond this, the College can assume no responsibility. It is the function of the shipper to see to it that the lot shipped for treatment is a representative or average sample of his ore body. If he fails to do this, the test will be worthless, except for purposes of student instruction. All ore shipped to the College of Mines and Metallurgy must be regarded as a gift to the College, and becomes the property of the College when it enters the mill building. The shipper will be expected to sign a statement that he has a body of ore developed of sufficient size to justify a treatment process test. The purpose of the work is to give instruction to students, to assist in the development of the Southwest, and help to prevent the installation of processes not adapted to the ore treated. No mill runs will be made during June, July, August, or September.

ANALYSES OF ORES

The College of Mines and Metallurgy has no desire to undertake analyses of ores in competition with professional assayers. Those who for special reasons wish their work to be done at the school should write to the dean for a statement of the conditions under which this is possible. Control work and sampling for ore shippers to the smelter will not be undertaken. Inquiries about coal should be sent to the Division of Economic Geology, about water to the Division of Industrial Chemistry, of the Bureau of Economic Geology and Technology, University of Texas, Austin.

Identification, i. e., information as to what a mineral is, is made free of charge, regardless of the nature of the mineral or from what state it comes. All samples or specimens sent to the College become its property, and will be either kept or thrown away, at the discretion of the authorities of the school. Supposed gems or precious stones *should be sent for identification or valuation, not to the College of Mines and Metallurgy, but to a jeweler or a lapidary.*

DEGREES CONFERRED IN 1921**Bachelor of Science in Mining Engineering**

James E. Crenshaw
William R. Cooper
Ramon M. Concha
Leopoldo E. Maldonado

John O'Keeffe
Ernest Carlton Kennedy
Richard Wallace Tighe
John Paul Savage

REGISTER OF STUDENTS

Long Session of 1921-1922

Backstrom, Russell E....El Paso	Lachman, Mrs. Edmund..El Paso
Baldwin, Edward B.....	Laughlin, Watterson....Bartlett
.....Mineral Wells	Lee, Wilfred.....Henderson
Beck, H. H.....Minden, La.	McCollum, John J....San Antonio
Berry, Dudley M.....San Antonio	McKinney, Lawson E....El Paso
Binford, William.....El Paso	McLean, George Dewey..El Paso
Black, Walcott.....Honey Grove	Maese, Robert H.....El Paso
Brown, Mrs. Margaret....El Paso	Markgraff, Ermen.....El Paso
Bull, Alexander J.....El Paso	Maud, John Elmer.....Austin
Burt, Eric.....Canutillo	Millar, Albert Elmsie.....
Canon, Roscoe H.....ShinerParral, Chihuahua, Mex.
Cheavens, John H.....El Paso	Miller, William L....San Antonio
Clements, Tom.....El Paso	Mills, William L....Ruston, La.
Coffey, Bonner L....Center Point	Mizner, Earl.....Wichita Falls
Cooney, Daniel....Roswell, N. M.	Moore, Edward R.....El Paso
Craig, Conway.....El Paso	Mosheim, Joe.....Seguin
Crosby, Ralph W.....El Paso	Mueller, Emil J.....Gerald, Mo.
Dale, Floyd.....Grinnell, Iowa	O'Keeffe, Tama.....El Paso
Dale, Ralph.....El Paso	O'Keeffe, Theresa.....El Paso
Davis, Mrs. H. K.....El Paso	Olsen, H. V.....Corpus Christi
Deaner, Lyell V....Madison, Wis-	Ormsbee, Charlotte B....El Paso
Dickinson, William E.....Rusk	Orndorff, Mrs. Lee.....El Paso
Donaldson, Homer F.....	Orndorff, Mrs. Seth.....El Paso
.....Carrizozo, N. M.	Parker, Esther.....El Paso
Doxey, Thomas Adams, Jr....	Pergain, Albert M.....El Paso
.....San Antonio	Preston, Eleanor.....El Paso
Esquivel, Sandy.....El Paso	Ragsdale, J. G., Jr.....El Paso
Evans, Arthur M.....Uvalde	Rhew, Redus.....Kingsville
Falkenhagen, Hodgo..Beaumont	Risacher, Felix.....Verona, Pa.
Foster, Justin.....El Paso	Robinson, Lewis.....Canutillo
Fox, Fred L.....Detroit, Mich.	Russell, Willard L..Hallettsville
Giles, L. C.....El Paso	Shipley, James.....Terrell
Glenn, James J....Des Moines, Ia.	Skidmore, Charles Alfred..El Paso
Gound, James N.....El Paso	Smith, Gordon M.....El Paso
Grigg, Richard S.....	Sory, Lonnie.....Greenville
.....Haddonfield, N. J.	Summers, Lloyd A.....El Paso
Groch, Frederick.....El Paso	Tatum, Merle.....El Paso
Haigh, Berte R..Los Angeles, Cal.	Temple, Carl E....Port Arthur
Hale, Paul.....El Paso	Tharp, Webster J.....Houston
Hamilton, Kenneth C....Laredo	Tighe, Richard W.....El Paso
Hardy, Kenneth.....El Paso	Troeger, John H.....Denison
Harris, John Lee.....Dublin	Vacher, Herbert..New Orleans, La.
Hendricks, Sam D....Mansfield	Villegas, Bernardo.....El Paso
Holford, J. C.....El Paso	Wheatley, Arthur C.....El Paso
Ingham, Winter I.....El Paso	Wheatley, Emmie.....El Paso
Irby, W. W.....Roswell, N. M.	White, Tom L.....Bartlett
Karchmer, Nathan K....Denison	Wilhelmn, Frederick..San Antonio
Kelly, Anne Word.....El Paso	Woodside, T. J., Jr....El Paso
Kidd, Robert L....Bristow, Okla.	Yanez, Jose R.....San Antonio
Kipp, Ewald, Jr.....El Paso	



