1965-1966

THE

GRADUATE SCHOOL

BULLETIN OF

LAMAR STATE COLLEGE OF TECHNOLOGY

Beaumont, Texas

Key To The Campus

GRADUATE SCHOOL

1965 - 1966

BEAUMONT, TEXAS

The courses, tuition and fees, and other policies explained in this 1965-1966 catalog shall remain in effect, with such conditions and alterations as may be authorized by the Board of Regents, until a new graduate catalog is issued.

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1966

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LAMAR STATE COLLEGE OF TECHNOLOGY

Graduate School Calendar for 1965-1966

Fall Semester, 1965

Sept. 14	Tuesday	8 a.m.	Registration for the fall semester.
		6:00 p.m.	Registration for evening students.
15	Wednesday	8 a.m.	Continued registration.
		6:30 p.m.	Evening classes begin.
16	Thursday	8 a.m.	Classes begin. Late registration—penalty fee charged.
20	Monday	8 p.m.	Last day for registering or adding courses.
Oct. 27	Wednesday	8 p.m.	Last day for dropping or withdrawing without penalty.
Nov. 24	Wednesday	10 p.m.	Thanksgiving holidays begin.
29	Monday	8 a.m.	Classes resume.
Dec. 3	Friday	5 p.m.	Last day for filing application for graduation in January. (Graduate Dean's office.)
14	Tuesday	1 to 5 p.m.	Comprehensive Written Examination.
17	Friday	5 p.m.	Christmas holidays begin.
Jan. 3	Monday	8 a.m.	Classes resume.
4	Tuesday	5 p.m.	Last day for submitting thesis to Graduate Dean.
Dec. 14-Jan. 14			Period for Comprehensive Oral Examinations.
Jan. 20-27	Thurs.-Thurs.		Final examinations.

Spring Semester, 1966

Feb. 1	Tuesday	11 a.m.	Registration for spring semester.
		6 p.m.	Registration of all evening students.
2	Wednesday	8 a.m.	Continued registration.
		6:30 p.m.	Evening classes begin.
3	Thursday	8 a.m.	Classes begin. Late Registration—penalty fee charged.
7	Monday	8 p.m.	Last day for registering or adding courses.
Mar. 16	Wednesday	7 p.m.	Last day for dropping courses or withdrawing without penalty.
Apr. 6	Wednesday	5 p.m.	Last day for filing application for graduation in May. (Graduate Dean's office.)

Apr.	7	Thursday	10 p.m.	Easter holidays begin.
	12	Tuesday	8 a.m.	Classes resume.
	20	Wednesday	1-5 p.m.	Comprehensive Written Examination.
Apr.	20-May 13			Period for Comprehensive Oral Examination.
Apr.	28	Thursday	5 p.m.	Last day for submitting thesis to Graduate Dean.
May	19-26	Thurs.-Thurs.		Final examinations.
	28	Saturday	8 p.m.	Commencement.

Summer Session, 1966

First Term

June	6	Monday	8 a.m.	Registration.
			6 p.m.	Registration—evening classes.
	7	Tuesday	7 a.m.	Classes begin. Late registration—penalty fee charged.
	8	Wednesday	7 p.m.	Last day for registration or adding courses.
	27	Monday	7 p.m.	Last day for dropping courses or withdrawing without penalty.
July	14-15	Thurs.-Fri.		Final examinations.

Second Term

July	18	Monday	8 a.m.	Registration.
			6 p.m.	Registration—evening classes.
	19	Tuesday	7 a.m.	Classes begin. Late registration—penalty fee charged.
	20	Wednesday	7 p.m.	Last day for registration or for adding courses.
	21	Thursday	4 p.m.	Last day for filing application for August graduation. (Graduate Dean's office.)
July	25-Aug. 12			Period for Comprehensive Oral Examinations.
	26	Tuesday	1-5 p.m.	Comprehensive Written Examination.
Aug.	1	Monday	4 p.m.	Last day for submitting thesis to Graduate Dean.
	8	Monday	7 p.m.	Last day for dropping courses or withdrawing without penalty.
	25-26	Thurs.-Fri.		Final examinations.
	27	Saturday	9 a.m.	Commencement.

LAMAR STATE COLLEGE OF TECHNOLOGY

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      M.S., Ph.D., Georgia Institute of Technology

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      Ph.D., The University of Texas

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  Ph.D., Louisiana State University

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  M.A., Ph.D., Louisiana State University

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To obtain prompt attention, address inquiries to
the following persons or agencies:

Academic Program—Admissions.......................M. L. McLaughlin
Dean, Graduate School

Academic Records and Transcripts......................Celeste Kitchen
Registrar

Business Affairs..H. C. Galloway
Comptroller

Graduate Record Examination...........................Joe B. Thrash
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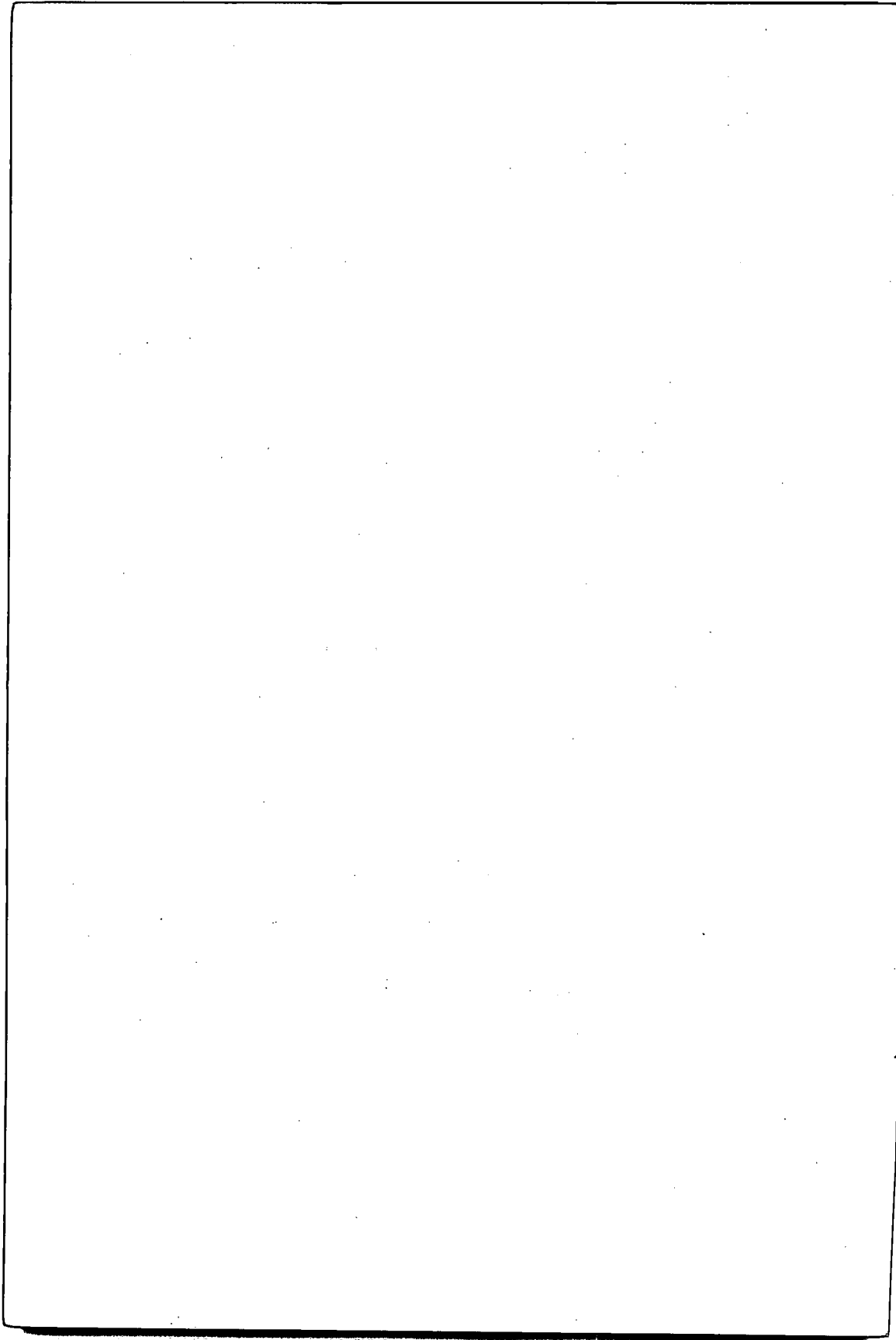
PART I

GENERAL COLLEGE INFORMATION
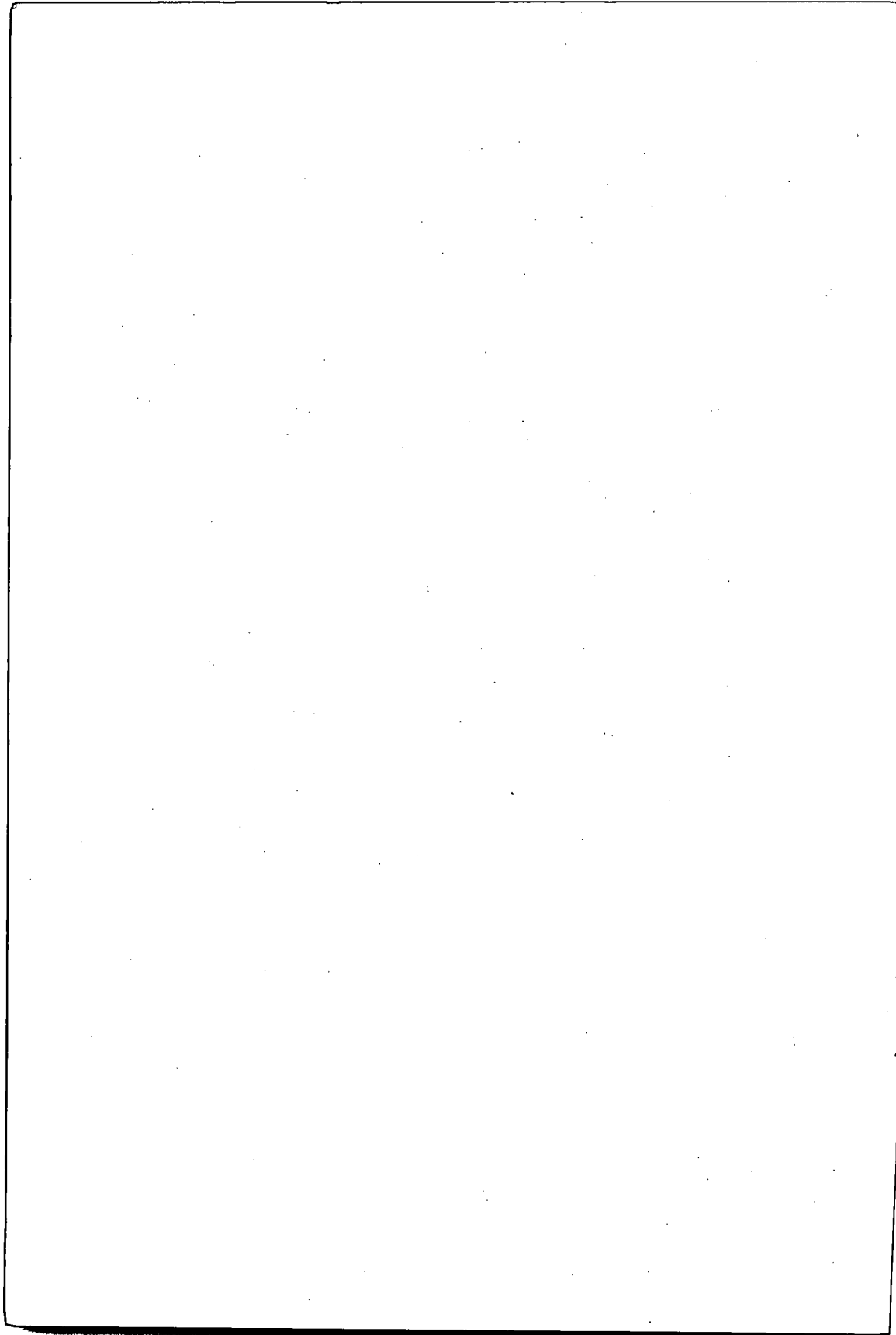
GENERAL INFORMATION

Location

Lamar State College of Technology is a state-supported institution located in the center of industrial Southeast Texas at Beaumont. Principal industries in the area are oil refining, shipping, shipbuilding, rubber manufacturing and chemical production. Surrounding the urban communities are ranches and rice farms.

The campus faces the Beaumont-Port Arthur Highway in southeastern Beaumont. With a population of approximately 120,000, Beaumont has modern schools, churches, and shopping districts to serve the thriving industrial community.

History

South Park Junior College was established in 1923. The college was organized and controlled by the South Park Independent School District, and classes were conducted in the South Park High School Building. Enrollment increased from about 125 in 1923 to 300 in 1931.

In 1932, the name of the institution was changed to Lamar College. At this time separate facilities were provided, additional equipment was purchased and new policies were instituted. By 1939, enrollment was approximately 640.

In 1940, Lamar Union Junior College District was created, and Lamar College was separated from the South Park Independent School District. Bonds were voted and new facilities were constructed on the site of the present main campus.

A movement to expand Lamar College into a four-year state-supported school culminated in the creation of Lamar State College of Technology on September 1, 1951. Since that time the curriculum has been expanded and liberalized to include many areas of study, and many additional facilities have been provided. Enrollment has increased until there are now over 7,800 students.

The College offered graduate work in specified fields beginning in the academic year of 1960-61.

Government

The government of the College is vested in a board of nine regents appointed by the Governor and approved by the Senate for terms of six years. The direction of academic affairs is delegates by the Board of Regents to the President, administrative officers, and faculty.

The general policies of the Graduate School are determined and administered by the Graduate Council.

Accreditation

Lamar is accredited by the Association of Texas Colleges and Universities and the Southern Association of Colleges and Secondary Schools.

The departments of Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering are accredited by the Engineering Council for Professional Development.

The Texas Education Agency has approved Professional Certification programs in history, English, and education.

The Library

With seating room for several hundred students, a reference room, a film supply room, a microfilm reader room, subscription to more than one thousand periodicals and over 85,000 volumes combined with a budget of sufficient size to increase volumes by several thousand per year, the library offers excellent service to both students and faculty.

Library hours are 7:45 a.m. to 10 p.m. Monday through Thursday, 7:45 a.m. to 5:00 p.m. Friday, 9:00 a.m. to 4:00 p.m. Saturday, and 2:00 p.m. to 5:00 p.m. Sunday. Closed holidays.

Research Center

The Research Center was formally organized in 1956. It is administered by a director who serves as chairman of the faculty research committee. Many National Science Foundation grants as well as private foundation grants have been received through this research organization.

Proposed faculty research projects are submitted each year for approval and financing through the Research Center.

The East Texas area is one of the most heavily industrialized sites of the world, and many industrial research problems are referred by industries of the area to the Lamar Research Center. Faculty members and advanced students often cooperate in seeking the solutions to these industrial problems.

Computer Laboratory

The college operates a computer laboratory as a division of the Research Center. This laboratory houses three major computers of the digital and analog type, valued in excess of $300,000. Faculty members and advanced students make use of these computers in various approaches to research problems.

Testing and Placement Service

The Testing and Placement Center is located in Room 102 of the Liberal Arts Building and is open 8:00 a.m. to 5:00 p.m. Monday through Friday.

This Center provides testing service for entering students and for others who want it. Non-students wishing to use this service pay a fee depending upon the testing program desired.

Placement service is also provided at this Center and is available to all students, faculty, and former students.

Health Center

The College maintains a Health Center for the use of students during the long term or summer session.

Two types of service are available: (1) out-patient service for those who have minor ailments but who do not require constant supervision, and (2) infirmary service for those who are in need of the continued attention of the College physician or a registered nurse.

It is not possible for the College to provide unlimited medical service. Special medicines, examinations, treatments, X-ray examinations, and laboratory tests are not furnished by the College. However, no charge is made for care in the Health Center up to ten days each semester. A small fee for drugs, supplies, and special services may be charged students required to remain in the Health Center for more than ten days.

The Health Center, located on East Virginia near Combs Hall, is adequately staffed and equipped for treating acute illnesses and minor injuries. It is not intended that the Center will provide care for students requiring surgery or the services of specialists. In these cases, every effort will be made by the College physician or nurse to notify the parents or guardians of the students' needs.

The College assumes no responsibility for continued medical care for students having chronic diseases. These students should arrange for the care of a private physician located in Beaumont or vicinity.

In the event the Health Center is filled to capacity, the College is not under obligation to provide hospital service elsewhere. However, the Health Center has a sufficient number of beds for all normal needs.

Students who are ill should report promptly to the Center for diagnosis and treatment. They will not be treated in the dormitory or in rooming houses. The College will take appropriate disciplinary action against students who refuse to report for medical advice when ill.

Veterans Education

Lamar is approved for educating veterans under the Vocational Rehabilitation Law, known as Public Law Number 16, and Public Law Number 550.

Veterans who are interested in continuing their education under federal laws providing such training are directed to secure information and aid in planning their college work by consulting the office for Veteran's Education, Room 102, Liberal Arts Building.

Veterans may lose payments for the first calendar month of the semester if application and enrollment forms are not completed by the end of registration week. It is not possible for the College to process late entries until the following month.

Loan Funds and Scholarships

Financial assistance in the form of loans and scholarships is available for a limited number of students. Details may be obtained from the "Bulletin of Scholarships and Loans" which can be obtained on request to the Dean of Student Life, Lamar State College, Beaumont, Texas.

Teaching Fellowships

A number of teaching fellowships are available in the various departments of the Graduate School. The stipend for a teaching fellowship varies in accordance with the number of college courses taught.

A graduate student employed as a teaching fellow must reduce his academic load in relation to his teaching assignment.

Specific information concerning teaching fellowships may be obtained from the Dean of the Graduate School.

Teacher Certification

Lamar State College of Technology has been approved by the Texas Education Agency to offer professional certification programs in Elementary and Secondary Education. Specific information concerning certification may be found in the "Education," "English," and "History" sections of this catalog or may be obtained from the Dean of the School of Education.

FEES AND EXPENSES

Payment of Fees

Lamar State College of Technology reserves the right to change fees in keeping with acts of the Texas Legislature.

A student is not registered until all his fees are paid in full. Payment may be made by check, money order, or currency. Checks and money orders, not in excess of total fees, should be made payable to Lamar State College of Technology and will be accepted subject to final payment.

Fees Summary

Resident Students (Texas)

Semester Hours	Tuition	S.S. Fee	Bldg. Use Fee	Total + Laboratory Fees		
12 or more	$50.00	$20.00	$12.00	$82.00	+ Lab	fee
11	47.00	20.00	12.00	79.00	" "	"
10	43.00	20.00	12.00	75.00	" "	"
9	39.00	20.00	12.00	71.00	" "	"
8	35.00	20.00	12.00	67.00	" "	"
7	31.00	7.00	6.00	44.00	" "	"
6	27.00	7.00	6.00	40.00	" "	"
5	23.00	7.00	6.00	36.00	" "	"
4	19.00	7.00	6.00	32.00	" "	"
3 or less	15.00	7.00	6.00	28.00	" "	"

Non-Resident Student (out of Texas)

Semester Hours	Tuition	S.S. Fee	Bldg. Use Fee	Total + Laboratory Fees		
12 or more	$200.00	$20.00	$12.00	$232.00	+ Lab	fee
11	183.00	20.00	12.00	215.00	" "	"
10	167.00	20.00	12.00	199.00	" "	"
9	150.00	20.00	12.00	182.00	" "	"
8	133.00	20.00	12.00	165.00	" "	"
7	117.00	7.00	6.00	130.00	" "	"
6	100.00	7.00	6.00	113.00	" "	"
5	83.00	7.00	6.00	96.00	" "	"
4	66.00	7.00	6.00	79.00	" "	"
3 or less	50.00	7.00	6.00	63.00	" "	"

For summer session students the student service fee is $5.00 per term.

These fees have been approved by appropriate acts of the Legislature of the State of Texas.

Property Deposit

Any student taking one or more courses is required by law to put up a $7.00 property deposit. This deposit, less any charges, is returnable when the student leaves the College and must be maintained at this level. Students who have not attended classes for four years, and have not filed for a return of their deposit, forfeit this deposit.

Parking Fee

Charges for campus parking for the entire school year will be made at the beginning of the semester in which you enroll.

Semester Hours	Fall	Spring	1st Summer	2nd Summer
8 or more	$6.00	$4.00	$2.00	$1.00
7 or less	3.00	2.00	1.00	1.00

Only one registration required for one school year.

Returned Check Fees

If a check is returned unpaid, the student is automatically suspended from college, but may re-enter upon redemption of the check plus payment of the return check fee of $2.00.

Special Fees

Fees for courses for which special plans must be prepared and for which specialists must be secured as instructors will be set for each such course by the college administration subject to the approval of the president.

Miscellaneous Fees

Binding Thesis (3 copies)	$15.00
Master's Diploma	6.50
Cap, Gown, and Hood Rental (Master's)	8.50
Late Registration	2.00
Returned Checks	2.00
Re-entry Fee	5.00
Transcript Fee	.50

Health and Accident Insurance

Additional health and accident coverage providing protection over and beyond that given by the health center is available at registration for students carrying 9 or more semester hours. The fee is $12.00 (estimated). For their protection and welfare this (or similar) insurance is required of all foreign students.

Refund of Fees

Any student withdrawing officially will receive a refund on tuition, student service, laboratory and private lesson fees according to the following schedule.

Long Session

1. During the first two weeks of the semester, 80 per cent.
2. During the third week of the semester, 60 per cent.
3. During the fourth week of the semester, 40 per cent.
4. During the fifth week of the semester, 20 per cent.

Summer Session

1. During the first week of the semester, 60 per cent.
2. After first week no refund.

No refunds are made when dropping courses.

Application for refund must be made to the Comptroller after the student has officially withdrawn, but not later than the end of the current semester or summer session.

It takes about 60 days to process these refunds.

Fine and Breakage Loss

All library fines, breakage or loss of equipment charges, or other charges must be paid before a transcript of credit or a permit to re-enter college will be issued.

The College reserves the right to make a special assessment against any student guilty of inexcusable breakage or loss of instructional equipment or other college property.

HOUSING

Dormitories

Dormitories for both men and women are ultra-modern residence halls, each three stories high. Each floor houses 36 students, organized into units for purposes of self-government, intramural athletics, and social life. Students live in suites for six. Each suite consists of two large bedrooms, two study rooms, and bath. Each room has a dial telephone for inter-campus and Beaumont exchange calls.

The Dining Hall serves three meals per day except on Sundays when only breakfast and lunch are served.

Costs

The charge for board and room for the nine-month term is $638 for

the residence halls. Charges for a full semester may be paid at the beginning of each semester; or for the convenince of those who desire, payments may be made as follows: (Students are required to pay the room rent for the semester in September and February and may purchase meal tickets on a monthly basis as outlined below:)

September	$137.50	(semester room rent)
	24.50	(September board)
	$162.00	
October	$ 48.00	
November	48.00	
December	30.00	
January	48.00	
	$336.00	
February	$110.00	(semester room rent)
	48.00	(February board)
	$158.00	
March	$ 48.00	
April	48.00	
May	48.00	
	$302.00	
Total (nine-month period)	$638.00	

(Currently subject to 2% sales tax on board or about $7.79 for nine months.)

If the monthly payment plan is followed, payments must be made on the first day of each semester and between the first and fifth day of all other months.

When students move into a dormitory, they automatically enter into a contract for room and board for the fall and spring semester, unless they officially withdraw from college or obtain special permission from the Dean of Student Life to live elsewhere.

Several window units are available for use in non-air-conditioned dormitories from April 15 to October 15 each year. Air conditioned rooms are $20 per month in addition to regular room charges, regardless of the number of occupants per room. Occupants share this additional cost.

Refunds for Board and Room

Board charges may be refunded as follows:

A student may obtain a refund for board or for room rent under the conditions listed below:

1. A written approval must be obtained from the director of housing and presented to the Comptroller for the specified payment.

2. The student must have been absent for approved cause in excess of ten consecutive days. The amount of the refund will be on a pro-rata basis beginning with the eleventh day of absence.

3. A student who withdraws from college before the close of a semester will be refunded board charges on a pro-rata basis for all remaining days paid for in advance.

Room rent charges may be refunded as follows:

1. A student who withdraws from school will be refunded the amount paid in advance for all months following the month of withdrawal. No refund will be made for the days remaining in the month of withdrawal after the first day of the month.

No refunds will be made for either board or room for official holidays or for absence from the campus other than those explained above since deductions for these were considered in determining the semester charges.

Summer Term

Charges for board and room for each six-week summer term are $121.50. This is payable at time of admission to the dormitory. Air conditioned rooms are $30 per six weeks in addition to the regular charge. Occupants share this additional cost.

Changes in Rates

The college reserves the right to change room and board rates with ten days notice.

Reservations

To reserve a room in the dormitories, direct a request to the Assistant to the Dean of Student Life, Lamar State College of Technology, Beaumont, Texas. A check for $20 must accompany the reservation request. Room reservations may be cancelled with full refund until three weeks prior to the first day of classes. No refund will be made on cancellations received after this date. Dormitory residents will be refunded deposits, less any breakage charges, at the end of the year. The $20 deposit will not be refunded if the student moves from the dormitory at any time other than at the end of the semester.

All unclaimed rooms will be declared vacant and the deposit forfeited at 6:00 p.m. on the last day of registration unless the student gives the Dean of Student Life Office written instructions to hold the room for a longer period.

Apartments

A limited number of accommodations for married couples are located on the campus and are operated by the college. Although ample for a couple, these apartments are not large enough to permit occupancy by children.

Three new modern fire proof, three-story buildings, each accommodating 35 couples, are now available. Each apartment consists of kitchenette, bath, two clothes closets, and combination living room-bed room. These apartments are completely furnished with fold-away beds, living room furniture, dinette set, kitchen stove, refrigerator, and window fan. There is also a central laundry with automatic washers and dryers.

These apartments rent for $585 for the nine months period. This rental includes all utilities except telephones. Renters may make direct arrangements with the telephone company if they desire telephone service.

A reserved parking space goes with each apartment and is leased to the renter at $6 for the nine months period.

For the convenience of students who wish to pay rentals by the month, the charges may be arranged in nine equal payments of $65 each.

For information regarding these apartments, write the Dean of Student Life Office. A $20 deposit is required to reserve an apartment. For those reserving apartments for the fall term the first payment of $65 is due by September 5. If this first payment is not received by September 5, the apartment will not be held and the deposit will be forfeited. Apartment residents will be refunded deposits when moving, less breakage or cleaning charges.

Some of these apartments can be air-conditioned from April 15 to October 15 upon request of the occupant. An additional $20 per month is charged for this service during the months of operation.

Rent refunds will not be made to students who move out during any month.

COLLEGE REGULATIONS

Course Numbering

Semesters of a course are numbered separately, and each number contains three or more figures. The first digit indicates the rank of the course: 1 means that it is for freshmen; 2, for sophomores; 3, for juniors; 4, for seniors; and 5, for graduates. The second figure indicates the number of semester hours credit. The third figure (or figures) indicates the order in which the course is taken. The letter a, b, c, or d following course numbers indicates partial credit in each case; full credit for such numbered courses will be granted only when the series is complete.

Postponed Examinations

Arrangements for taking postponed examinations and examinations for removing conditions are made with the department head concerned. Such arrangements should be made at least forty-eight hours ahead of time for the examinations.

Changing Schedules

No course may be added, changed or dropped without the permission of the department head of the student's major field. Usually a course may not be added after the first week of the semester (first two days of summer session). Likewise, section changes may not be made after a life period unless the change involves one instructor only. See college calendar.

Dropping Course

A student may drop a course without penalty during the first six weeks (three weeks of the summer session) of the semester.

For drops after this penalty free period, grades are recorded as **Drop** or **F** indicating that the student was passing or failing at the time of the drop.

A student may not drop a course within three days of the beginning of the final examination week.

Withdrawals

A student wishing to withdraw for the remainder of a semester, or term, should fill out a Withdrawal Petition in triplicate, after clearing all financial obligations, and returning all uniforms, books, laboratory equipment, and other materials to the point of original issue.

The Withdrawal Petition is signed by the Dean of the Graduate School and, together with a withdrawal notice for each class, is then presented to the Registrar by the student.

On application before the end of the semester or summer term, the Comptroller will return such fees as are returnable according to the schedule shown under the "Fees" section of the Catalog Bulletin. This refund is made only to the person withdrawing and if requested before the end of the current semester or summer term.

If a withdrawal is made before the end of the first six weeks (three weeks of summer term) or if the student is passing at the time of withdrawal, a grade of "W" is issued for each course so affected. A grade of "F" is issued for all courses not being passed at time of withdrawal after this penalty-free period.

A student may not withdraw within three days of the beginning of final exam week.

A student who leaves without an official withdrawal will receive a grade of "F" in all courses and will forfeit all returnable fees.

Enforced Withdrawal Due to Illness

The Director of the Health Center and the Dean of Student Life on the advice of competent medical personnel may require withdrawal, or deny admission, of a student for health reasons (mental or physical).

Discipline

It is assumed that any student eligible for admission to the College is familiar enough with the ordinary rules of conduct for ladies and gentlemen to need no definite discipline regulations. The College reserves the right to place on disciplinary probation or to dismiss any student at any time for sufficient cause.

Any activity sponsored by any group of Lamar students recognized as such must conform to behavior requirements of the College. The officers of the particular group are held responsible for the behavior of the participants in the sponsored activity. Failure to maintain this standard of behavior may subject the group to suspension of all social activities for as much as one long session.

Possession or use of alcoholic liquors on the campus is forbidden by law, and the guilty student is subject to immediate dismissal as well as criminal prosecution. Possession or use of such liquors at any college-sponsored function is classified as unacceptable behavior.

Penalty for False Statements

A student who makes a false statement to any college official or on any official form submitted to the College is subject to immediate dismissal.

Official Summons

An official summons from any administrative office takes precedence over all other college activities of the student and should be answered promptly on the day and hour designated. Failure to heed this official summons may subject the student to serious disciplinary action.

Parking Regulations

At registration time each student who pays the necessary fee is issued a car sticker which permits parking on the campus. This sticker is numbered and is to be placed in a specific place on the back window of the car.

Student Debts

The College is not responsible for debts contracted by individual students or student organizations and will not act as a collection agency for organizations, firms, or individuals to whom students may owe bills.

Students and student organizations are expected to honor contractual obligations promptly, but in case of flagrant disregard of such obligations the Dean of Men (Women) will take appropriate action depending on age or marital status of the student concerned.

Penalty for failure to clear up these obligations may be: a) No re-admission; b) Withholding of grades and transcript; c) Withholding of degree.
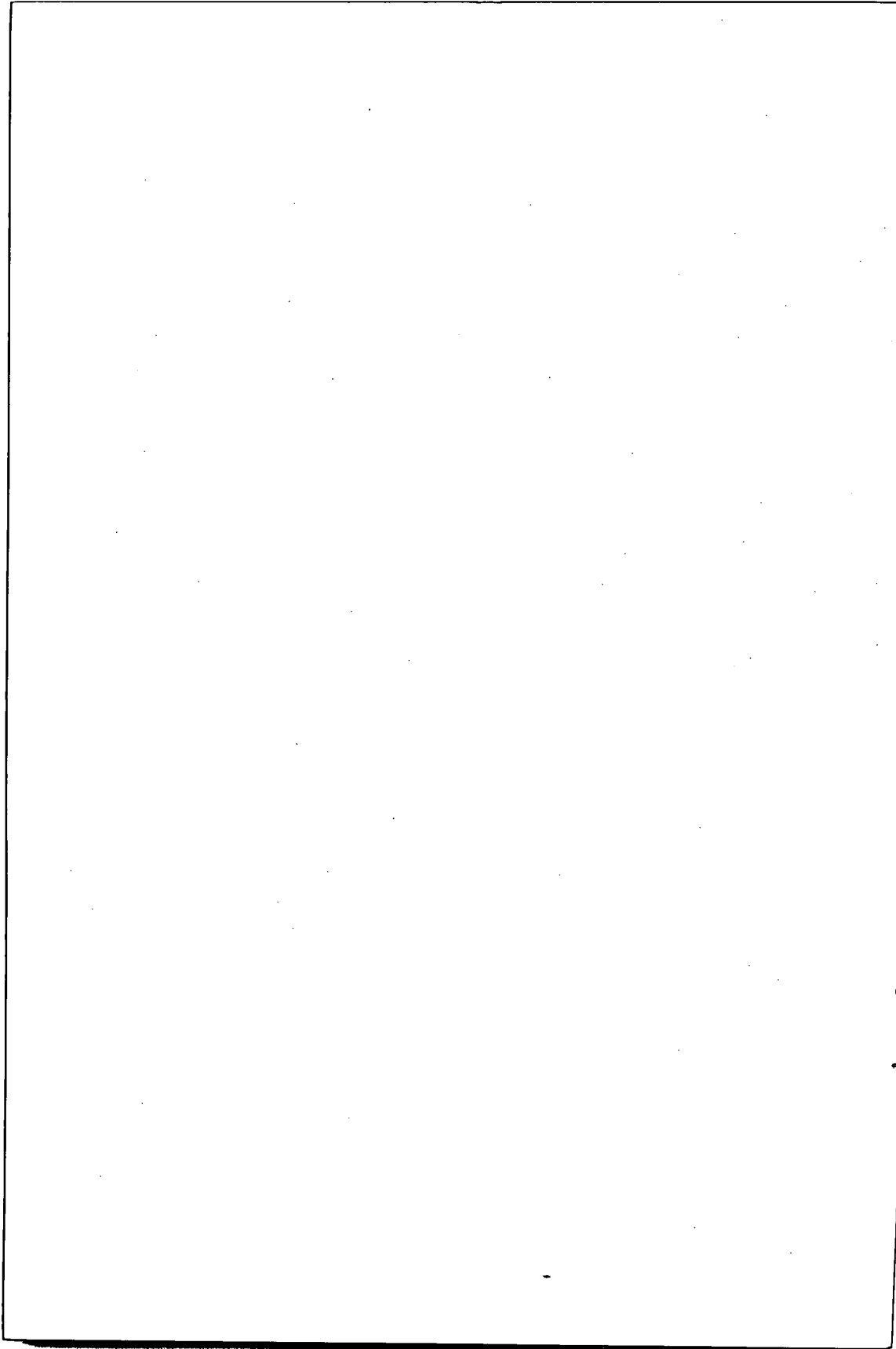
PART II

GRADUATE SCHOOL INFORMATION
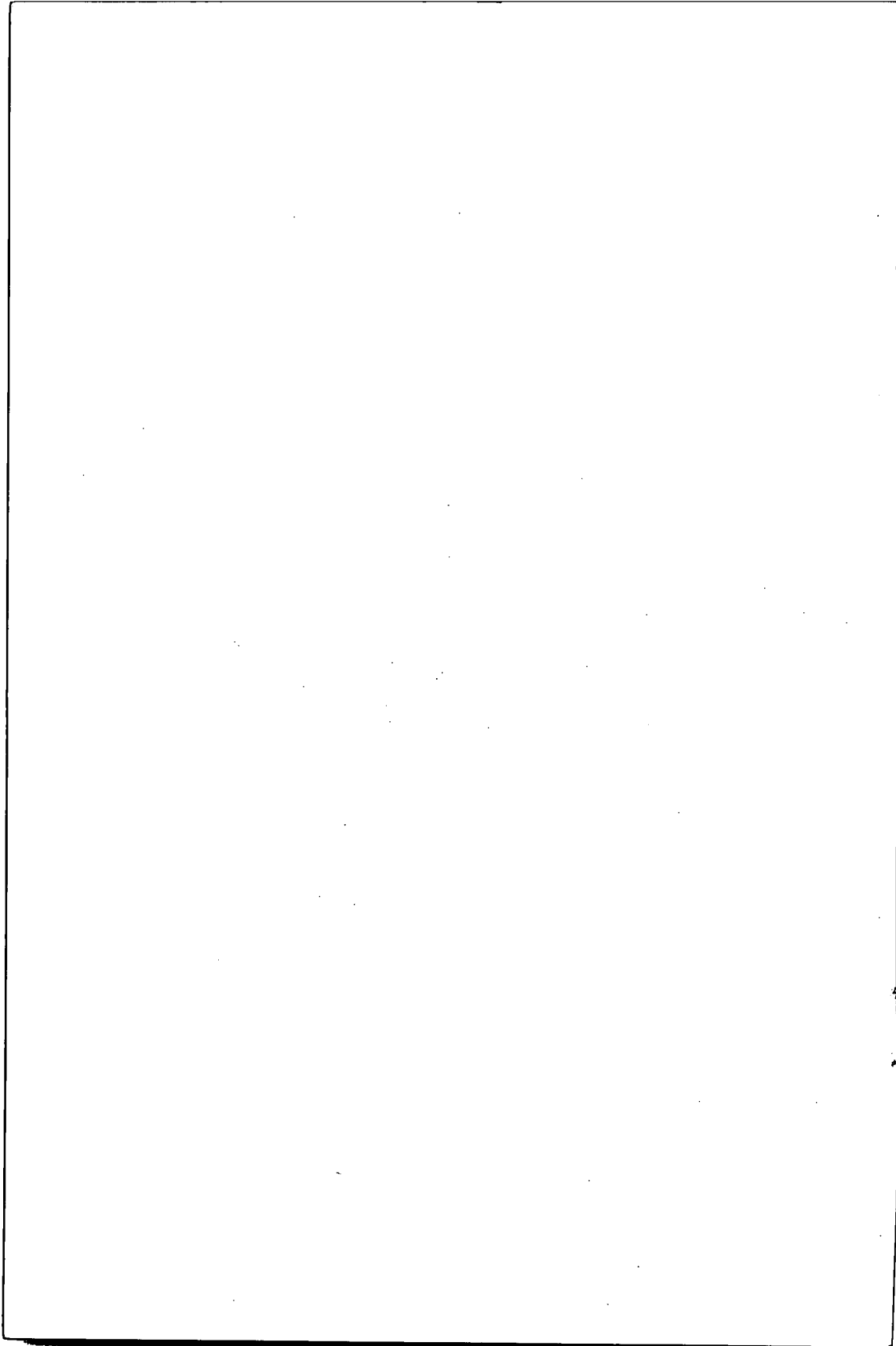
THE GRADUATE SCHOOL

History

The Graduate School was instituted in the fall, 1960, with the offering of the Master of Arts degree in the fields of history and English. Teacher certification programs were also available in each of these fields.

In 1962, master's degrees were authorized in mathematics, engineering, and elementary education. Additional master's degrees in chemistry and in special education have been authorized beginning in the fall of 1965.

Objectives

The objectives of the Graduate School are as follows:

1. Advancement of knowledge through research.
2. Intensification within a student's chosen field of specialization and allied areas.
3. Development of the student's skill in the methodology of research.
4. Promotion of the power of independent thought by making the student responsible for his own scholarship.

Degrees Offered

Master of Arts

Master of Arts in English
Master of Arts in History

Master of Science

Master of Science in Mathematics
Master of Science in Chemistry

Master of Engineering Science

Master of Education

Master of Education in Elementary Education
Master of Education in Special Education

ENROLLMENT

Admission

Applicants seeking admission to the Graduate School must present evidence that their academic record and personal attributes indicate the ability to pursue graduate work successfully. Admission to the Graduate School is administered by the Graduate Council. In general, the policies set forth by this Council for admission are as follows:

1. An applicant must hold a bachelor's degree or its equivalent from an institution approved by a recognized accrediting agency.

2. The following official credentials should be filed with the Dean of the Graduate School at least four weeks before registration.

   A. An official transcript sent directly from each college previously attended.

   B. Two completed copies of the application for admission to the Graduate School.

   C. Scores on the aptitude and the appropriate subject matter area of the Graduate Record Examination (sent directly to the Dean of the Graduate School by the Educational Testing Service). The College Testing and Placement Center, located in Room 102 in the Liberal Arts Building, administers the Graduate Record Examination. Application forms and information about the Graduate Record Examination are available at this Center.

3. The applicant's undergradute grade point average and Graduate Record Examination scores must be above the minimum standard established by the Graduate School. These standards are:

   A. For regular admission the applicant must have a grade point average of 2.0 (3 point scale) and a satisfactory score on the aptitude section of the Graduate Record Examination.

   B. Upon recommendation by the major department, an applicant with a grade point average below 2.0 and a satisfactory score on the Graduate Record Examination may be admitted on probation. This probation may be removed after the student completes nine semester hours of graduate work with grades of B or better.

   C. Information concerning minimum standards for the Graduate Record Examination may be obtained from the Dean of the Graduate School.

4. A student who wishes to pursue graduate work in any area for which he has not had the prerequisites will be required to make up deficiencies as prescribed by the Graduate Council. In general, the student is required to have a minimum of twenty-four semester hours (twelve of which must be on the junior-senior level) of undergraduate work in the subject chosen as the graduate major. For a minor, twelve semester hours of undergraduate work are required.

5. Admission to the Graduate School does not imply candidacy for a master's degree.

6. The Dean of the Graduate School will notify the applicant of his admission to the Graduate School. All transcripts, certificates, etc., become the property of the Graduate School and are not returnable.

Special Students

An applicant who wishes to enroll in a graduate course without receiving credit toward any graduate degree may do so under the following conditions:

1. He must hold a bachelor's degree.

2. He must have the written consent of the Dean of the Graduate School.

3. An individual may not pursue more than two courses under this agreement and only one such course in any semester or summer term.

Registration

1. A student who has been admitted to the Graduate School may register in September or February for the long sessions, or in June or July for the summer terms.

2. An applicant for a graduate degree must be registered during the semester or summer session (one term is considered sufficient) in which the degree is to be awarded.

3. A graduate student who has completed all course work, but is working on his thesis, must be registered if he wishes to obtain professional assistance from a faculty member.

GRADUATE SCHOOL REQUIREMENTS

General

1. All the course work applied toward a given degree must be completed within a period of six years. Time spent in active military service will not be used in computing the six-year limit.

2. No graduate student is permitted to carry more than fifteen semester hours of graduate work during one semester of the long term nor more than twelve semester hours of graduate work during the summer session of twelve weeks.

3. With the approval of the head of the major department and the Graduate Dean, an undergraduate student within twelve semester hours of graduation may take not more than six semester hours of graduate courses to be applied toward the master's degree, provided the total academic load does not exceed the maximum load for graduate students.

4. The grading system for graduate students is A, B, C, D, F, I, Drop, Withdrawal—graduate credit being allowed for grades of A and B only.

5. With the approval of the head of the major department and the Graduate Dean, the student may transfer as much as six semester hours of graduate work completed at another institution.

6. No academic work done in extension courses may be transferred or applied to graduate degree programs.

7. A student must be enrolled in the semester or one term of a summer session in which he receives his degree.

8. A student may be required to drop either from any course or from the College temporarily, or permanently, for any of the following reasons:

   A. Academic work below the standard as specified by the Graduate Council.

   B. Academic dishonesty or misconduct on the part of the student.

9. Resignation from the Graduate School should be made in writing to the Dean.

10. The College reserves the right to change any of its rules, requirements, or course regulations without notice.

DEGREE REQUIREMENTS

General

1. A graduate student must earn thirty to thirty-six semester hours of graduate credit depending upon the plan he is following and must complete a residence requirement of at least one academic year or its equivalent in summer terms.

2. A minimum of eighteen semester hours of the required thirty to thirty-six hours must be courses numbered 500 or above. Courses numbered 300 may be used for graduate credit if extra academic work is required and if prior written approval is secured from the department head, the head of the department in which the work is taken, and the Graduate Dean.

3. All candidates must pass a comprehensive oral examination if a thesis is written. If a thesis is not written, a comprehensive written examination is required.

4. The student must meet the specific requirements as set forth in this Catalog for his particular degree program.

Master of Arts

1. Meet all general degree requirements.

2. Complete thirty semester hours of graduate work: eighteen in the major field, six in thesis, six in an approved minor or six additional hours in the major.

3. Present evidence of a reading knowledge of at least one foreign language. This requirement may be satisfied by examination or by submitting college credit equivalent to that required for the degree of Bachelor of Arts in the institution.

Master of Science

1. Meet all general degree requirements.

2. Complete thirty semester hours of graduate work: fifteen to eighteen semester hours in the major field, six in thesis, and six to nine semester hours in the minor field.

Master of Engineering Science

1. Meet all general degree requirements.

2. Complete thirty semester hours of graduate work as follows: a minimum of twelve semester hours in engineering courses, six semester hours in thesis, and a minimum of nine semester hours in a combination of science and mathematics.

Master of Education

1. Meet all general degree requirements.

2. Earn a minimum of thirty-six semester hours if a thesis is not planned including: twenty-one semester hours in education and fifteen semester hours in academic subject matter areas.

3. Earn a minimum of thirty semester hours if a thesis is planned including: twelve semester hours in education, six semester hours in thesis, and nine semester hours in academic subject matter areas.

ADMISSION TO CANDIDACY

1. Prior to the time that a graduate student is admitted to candidacy, the head of the major department or a person designated by him acts as the student adviser.

2. A student may be admitted to candidacy after completing one-half of his course work, excluding the thesis, and after removing all undergraduate deficiencies. During this time he must have demonstrated his ability and inclination to do graduate work.

3. The individual student is responsible for making an application for Admission to Candidacy. This is done in the office of the head of the major department.

4. A departmental recommendation concerning the applicant's degree plan and the appointment of an advisory committee is then submitted to the Graduate Council. If approved, the student is admitted to candidacy.

5. The advisory committee will include a person designated as the major professor, along with two other members of the faculty. One member of the Committee must be from outside the student's major field.

6. A student must complete at least nine semester hours after admission to candidacy.

THESIS REQUIREMENTS

The Master of Arts, Master of Science, and Master of Engineering Science degrees require a thesis. The Master of Education degree offers two plans, one of which does not require a thesis. A student who is required or elects to write a thesis must:

1. Register for the thesis course after he has been admitted to candidacy and has obtained the approval of the head of the department. The first registration is for Thesis Course 669A; subsequent registrations are for Thesis Course 669B. The grade of "I" is assigned for each registration until the thesis is finally approved.

2. Register for a thesis course each semester or term that he works on the thesis under active supervision.

3. Secure a copy of the approved manual of instructions for preparing a thesis and follow it explicitly.

4. Write a thesis under the direction of his supervising professor. The thesis must be approved by his advisory committee and the Graduate Dean. Six semester hours of credit will be granted for the successful completion of the thesis. No credit will be reported for the thesis course until the final copy of the thesis has been approved.

5. Submit a single, unbound copy of the thesis to the Dean of the Graduate School at least thirty days prior to the expected date of graduation.

6. Submit three copies of the finished thesis to the Graduate Dean no later than ten days prior to the graduation date.

7. Pay the thesis binding fee to the Lamar Bookstore no later than ten days prior to the graduation date.

FINAL EXAMINATION

1. Each candidate for a master's degree is required to pass a final oral or written examination. This examination must be taken at least fifteen days prior to the conferring of the degree.

2. A student presenting a thesis as a part of the degree requirement must take an oral examination. This examination is confined to the thesis and background subject matter pertaining to the thesis.

3. A candidate not presenting a thesis as a part of the degree requirement must take a written examination.

4. A Calendar showing scheduled dates for oral and written examinations is prepared by the Dean of the Graduate School.

CONFERRING OF DEGREES

Degrees earned in the Graduate School are conferred at the annual commencement in June and August. The candidate must be present to receive the degree, unless he has been excused by the Graduate Dean.

1. A candidate for the Master's degree must file an application for graduation in the office of the Graduate Dean. This application must be made in accordance with the calendar published in this bulletin.

2. Requests to receive a degree in absentia must be filed in the Graduate Dean's office at least four weeks before commencement date.
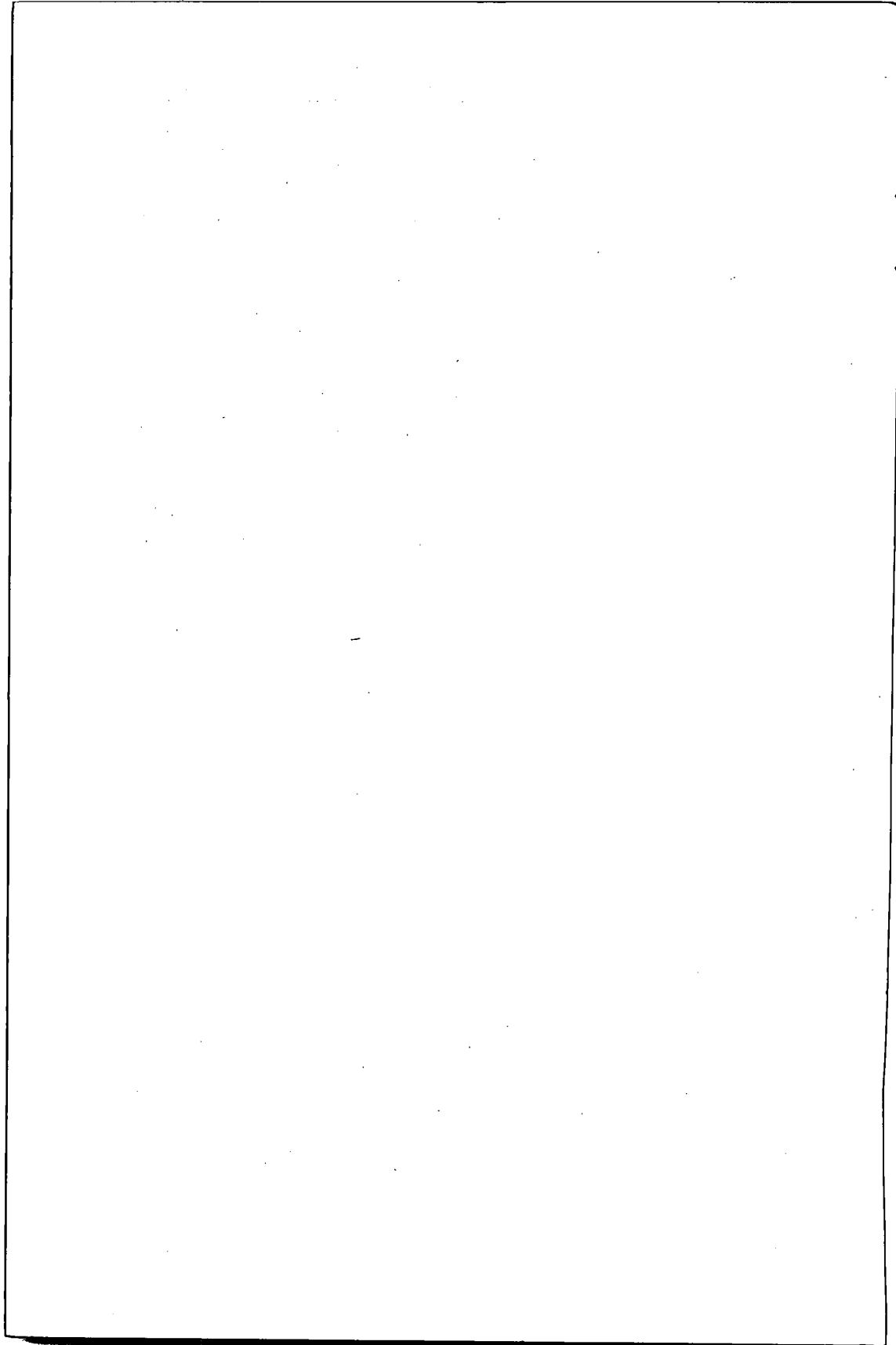
PART III

FIELDS OF STUDY
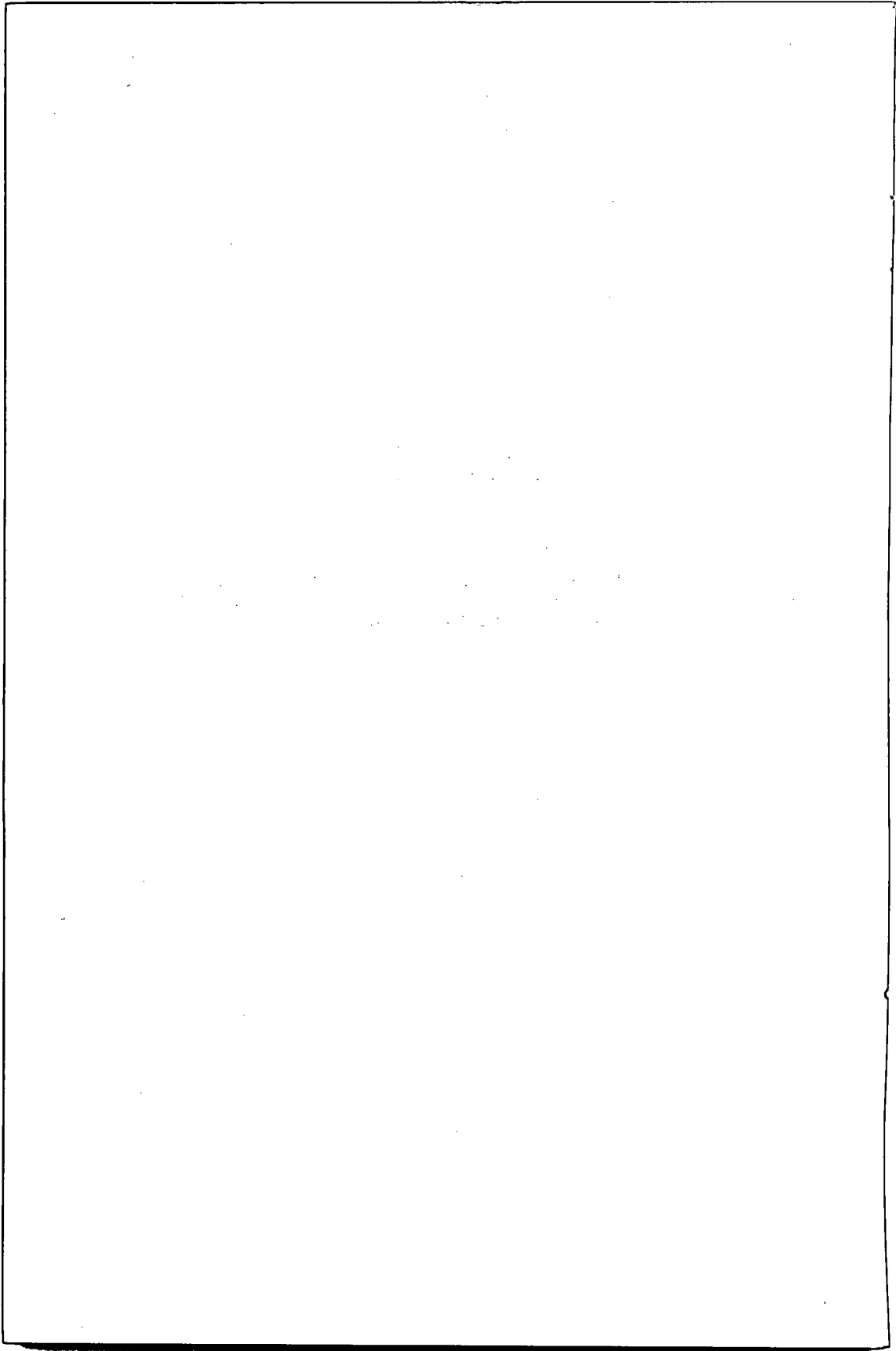
DEPARTMENT OF CHEMISTRY

The Department of Chemistry offers a program of study leading to the Master of Science degree in Chemistry. Those seeking admission to this program must meet the general requirements as set forth in this catalog for admission to the Graduate School. In addition, the applicant must offer the substantial equivalent of the courses in general chemistry, inorganic chemistry, analytical chemistry, organic chemistry, and physical chemistry required of undergraduate students in the first three years of the chemistry curriculum. The applicant must also have completed one year of college physics and mathematics through integral calculus.

Students working towards the graduate degree in chemistry will take a set of four proficiency examinations, one in each of the fields of chemistry: analytical, inorganic, organic, and physical. These examinations are taken on entrance and are offered in the fall and again during the beginning of the spring semester. The results of these examinations are used for orientation and guidance.

Degree Requirements

The candidate for the M.S. degree in Chemistry must meet all the Graduate School general degree requirements as listed in this catalog. Additional specific degree requirements are as follows:

1. Fifteen to eighteen semester hours of course work in chemistry and six hours of thesis. At least nine semester hours, exclusive of the thesis, must be in chemistry courses numbered 500 or above.

2. Presentation of a thesis.

3. Six to nine additional semester hours of senior or graduate work in an approved field of study.

4. A reading knowledge of one of the following modern foreign languages: German, French, or Russian.

GRADUATE FACULTY

Members

Professor Harold T. Baker
    Physical Chemistry and Radiochemistry

Professor Margaret D. Cameron
    Organic Chemistry

Professor Ewin A. Eads
    Inorganic Chemistry

Associate Professor J. D. Edwards
    Organic Chemistry

Professor Robert G. Mers
    Physical Chemistry

Associate Professor Roger E. Yerick
    Analytical Chemistry and Radiochemistry

    The graduate student will select his chemistry courses from the following list:

    431—Organic Preparations. A survey of organic chemistry from the standpoint of reaction types, their scope, and usefulness in organic synthesis. The laboratory preparation of organic materials with special attention to techniques and yields. Prerequisite: Chm 342. Class: 2 hours. Laboratory: 6 hours. Credit: 3 semester hours.

    435—Modern Organic. Selected topics in modern organic chemistry with particular emphasis on reaction mechanisms. Prerequisites: Chm 342, 344 (or parallel). Class: 3 hours. Credit: 3 semester hours.

    436—Inorganic Periodicity. Study of the quantized atom, periodicity, characteristics dependent on the extra-nuclear structure. Valency and the chemical bond, complex ions and coordination compounds. Oxidation-reduction and oxidation potentials. Acids and bases and non-aqueous solvents. Prerequisites: Chm 333, 344 (or parallel). Class: 3 hours.

    439—Nuclear Chemistry. Theory of nuclear structure. Properties of nuclear radiations. Natural and artificial radioactivity and applications of radioactive tracers. Prerequisite: 24 semester hours of chemistry. Class: 3 hours. Credit: 3 semester hours.

    443—Biochemistry. Principles of biochemistry. Current theories of chemistry as applied to biochemical materials. Prerequisites: Chm 241, 342 (or parallel). Class: 3 hours. Laboratory: 4 hours. Credit: 4 semester hours.

    446—Instrumental methods of Analysis. Instrumental techniques in modern analytical chemistry. Theory and practice in optical, electrometric, and chromatographic methods. Prerequisites: Chm 344 (or parallel). Class 3 hours. Laboratory: 4 hours. Credit: 4 semester hours.

    531—Advanced Analytical. Selected topics in contemporary analytical chemistry. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: Graduate standing. Class: 3 hours. Credit: 3 semester hours.

    533—Advanced Inorganic. Selected topics in modern inorganic chemistry. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: Graduate standing. Class: 3 hours. Credit: 3 semester hours.

535—**Advanced Organic.** Selected topics in modern organic chemistry with particular emphasis on reaction mechanisms. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: Graduate standing. Class: 3 hours. Credit: 3 semester hours.

537—**Advanced Physical.** Selected topics in physical chemistry. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: Graduate standing. Class: 3 hours. Credit: 3 semester hours.

669A-669B—**Thesis.** Prerequisite: Admission to candidacy for the master's degree. Credit: 6 semester hours.

DEPARTMENT OF EDUCATION

The Department of Education offers programs of study leading to the Master of Education degree and/or certification in Elementary Education or in Special Education.

The Department also offers courses to fulfill the Professional Development requirements for a Professional Certificate in Secondary Education in the areas of English and history.

Master of Education Degree (M.Ed.)

General Requirements

1. The student must fulfill the general requirements for admission and the general degree requirements that are stated elsewhere in this Bulletin.

2. The applicant in elementary education must have completed twenty-four semester hours in education, including twelve semester hours in elementary education methods and materials courses.

3. The applicant in special education must have completed a minimum of twenty-four semester hours in education, including six semester hours in special education and twelve semester hours in elementary education methods and materials courses.

4. The student must have completed a course in supervised student teaching or have taught one year.

5. The student may elect to write a thesis. If so, he is required to complete a minimum of twenty-four hours in addition to a thesis.

6. The student who does not choose to write a thesis must earn a minimum of thirty-six hours of graduate credit.

7. The student who does not write a thesis is required to complete successfully a written examination.

Degree Plan in Elementary Education

To meet individual needs, considerable flexibility is allowed in planning the student's program; however, the usual pattern of course work is as follows:

1. Specialization Area. Six semester hours of senior or graduate level courses must be taken in one of the following disciplines: history, English, foreign languages, mathematics, sciences, art, music, speech, or health and physical education.

2. Professional Development. Twenty-one semester hours must be selected from the following courses (eighteen semester hours if the student elects to write a thesis):

   A. Nine semester hours (or three if the thesis is written) must be selected from the following courses:

      (1) Edu 530 — Structure and Organization of Public Education
      (2) Edu 531 — Research
      (3) Edu 532 — Current Issues in Education
      (4) Edu 533 — Contemporary Philosophy of Education
      (5) Edu 535 — Advanced Educational Psychology

   B. Twelve semester hours (or nine if the thesis is written) must be selected from the following courses:

      (1) Edu 534 — Advanced Study in Child Psychology
      (2) Edu 536 — Problems in Teaching Language Arts and Social Studies
      (3) Edu 537 — The Elementary School Curriculum
      (4) Edu 538 — Problems in Teaching Arithmetic and Science
      (5) Edu 539 — Developmental Reading

   C. Thesis. Six semester hours credit:

      (1) Edu 669A-669B — Thesis

3. Resource Area. Nine semester hours must be selected from the following courses (six semester hours if the student elects to write a thesis):

   A. Bio 431 — Seminar in Biological Sciences
   B. Eco 4312 — Seminar in Economics
   C. Edu 5310 — Current Literature for Children and Adolescents
   D. Geo 430 — Earth Science Seminar
   E. Mth 530 — Seminar in Mathematics for Elementary Teachers
   F. Phy 430 — Seminar in Physical Sciences
   G. Soc 430 — Seminar in Principles of Sociology
   H. Spc 439 — Seminar in Fine Arts

Program Leading to Professional Certificate—Elementary

To be eligible to receive the Professional Certificate, the prerequisites and requirements must be met as follows:

1. The student must hold or be eligible for the provisional Certificate—Elementary.

2. The student must complete the following program of study:

   A. Specialization Area. Twelve semester hours of graduate level courses must be taken in one of the following disciplines: history, English, mathematics, or chemistry.

   B. Professional Development Area. Twelve semester hours must be selected from the following courses:

      (1) Edu 530 — Structure and Organization of Public Education

      (2) Edu 531 — Research

      (3) Edu 532 — Current Issues in Education

      (4) Edu 533 — Contemporary Philosophies of Education

      (5) Edu 534 — Advanced Study in Child Psychology

      (6) Edu 535 — Advanced Educational Psychology

      (7) Edu 536 — Problems in Teaching Language Arts and Social Studies

      (8) Edu 537 — Elementary School Curriculum

      (9) Edu 538 — Problems in Teaching Arithmetic and Science

      (10) Edu 539 — Developmental Reading

      (11) Edu 5310 — Current Literature for Children and Adolescents

   C. Resource Area. Six semester hours must be selected from the following courses:

      (1) Bio 431 — Seminar in Biological Sciences

      (2) Eco 4312 — Seminar in Economics

      (3) Geo 430 — Earth Science Seminar

      (4) Mth 530 — Seminar in Mathematics for Elementary Teachers

      (5) Phy 430 — Seminar in Physical Sciences

      (6) Soc 430 — Seminar in Principles of Sociology

      (7) Spc 439 — Seminar in Fine Arts

Degree Plan in Special Education—Mental Retardation

To meet individual needs, considerable flexibility is allowed in planning the student's program; however, the usual pattern of course work is as follows:

1. Specialization Area. Twelve semester hours must be selected from the following courses:

   A. Edu 5311 — Advanced Studies in Mental Retardation

   B. Edu 5312 — Occupational Education for the Mentally Retarded

   C. Edu 5313 — Psychology of the Mentally Retarded

   D. Edu 5314 — Seminar on the Education of the Mentally Retarded

   E. Edu 5315 — Problems and Issues in Special Education

   F. Edu 5316 — Administration and Supervision of Special Education Programs

2. Professional Development. Nine semester hours must be selected from the following courses:

   A. Nine semester hours must be selected from the following courses. (Three semester hours if the student elects to write a thesis):

      (1) Edu 530 — Structure and Organization of Public Education

      (2) Edu 531 — Research

      (3) Edu 532 — Current Issues in Education

      (4) Edu 533 — Contemporary Philosophies of Education

      (5) Edu 534 — Advanced Study in Child Psychology

      (6) Edu 535 — Advanced Educational Psychology

      *(7) Edu 430 — Education of the Mentally Retarded

      *(8) Edu 431 — Psychology of Exceptional Children

   B. Thesis. Six semester hours credit:
      (1) Edu 669A-669B — Thesis

3. Resource Area. Fifteen semester hours of senior or graduate courses are required as follows (nine semester hours if a thesis is written):

   A. Six semester hours of senior or graduate level courses must be taken in one of the following disciplines: history, English, foreign languages, mathematics, sciences, art, music, speech, or health and physical education.

   B. Nine semester hours must be selected from the following seminars (three semester hours if a thesis is written):

      (1) Bio 431 — Seminar in Biological Sciences

      (2) Eco 4312 — Seminar in Economics

*This course may be taken only by special permission and only if needed to fulfill certification requirements.

    (3) Geo 430 — Earth Science Seminar

    (4) Mth 530 — Seminar in Mathematics for Elementary Teachers

    (5) Phy 430 — Seminar in Physical Sciences

    (6) Soc 430 — Seminar in Principles of Sociology

    (7) Spc 439 — Seminar in Fine Arts

    (8) Edu 5310 — Current Literature for Children and Adolescents

Program Leading to Professional Certificate—Mental Retardation

To be eligible to receive the Professional Certificate, the prerequisites and requirements must be met as follows:

1. The student must hold or be eligible for the Provisional Certificate—Mental Retardation.

2. The student must complete the following program of study:

    A. Specialization Area. Twelve semester hours of graduate level courses must be taken in the field of mental retardation, as follows:

        (1) Edu 5311 — Advanced Studies in Mental Retardation

        (2) Edu 5312 — Occupational Education for the Mentally Retarded

        (3) Edu 5313 — Psychology of the Mentally Retarded

        (4) Edu 5314 — Seminar on the Education of the Mentally Retarded

    B. Professional Development Area. Six semester hours must be selected from the following courses:

        (1) Edu 530 — Structure and Organization of Public Education

        (2) Edu 531 — Research

        (3) Edu 532 — Current Issues in Education

        (4) Edu 533 — Contemporary Philosophies of Education

        (5) Edu 534 — Advanced Study in Child Psychology

        (6) Edu 535 — Advanced Educational Psychology

    C. Resource Area. Six semester hours of senior or graduate level courses must be taken in one of the following disciplines: history, English, foreign languages, mathematics, sciences, art, music, speech, and health and physical education.

    D. Electives. Six semester hours must be selected from senior or graduate level courses as approved by the advisor.

Program Leading to Professional Certificate—Secondary

To be eligible to receive the Professional Certificate, the prerequisites and requirements must be met as follows:

1. The student must hold or be eligible for the Provisional Certificate—Secondary in the designated area.

2. The student must complete the following program of study:

   A. Specialization Area. Eighteen semester hours of graduate courses must be completed in the area of English or history, of which twelve semester hours must be in graduate level courses.

   B. Resource Area. Six semester hours in senior or graduate courses must be completed in one or more of the following areas (different from specialization area): English, history, government, sociology, foreign languages, mathematics, and sciences.

   C. Professional Development. Six semester hours of approved courses in professional education must be completed.

General Information Concerning
Professional Certificates

Validity

The Professional Certificate is valid for life unless canceled by lawful authority and gives the holder legal authority to perform duties in the public schools of Texas in the specialized areas designated on the face of the certificates.

Requirements:

1. Have completed the requirements for a Provisional Certificate.

2. Have at least three years of teaching experience.

3. Have completed an approved teacher education program.

4. Be of good moral character.

5. Be a citizen, or in the process of becoming a naturalized citizen of the United States.

6. Believe in and uphold the Constitutions of the United States and the State of Texas.

7. Have completed, in a Texas institution of higher learning, a course or courses in which the Constitutions of the United States and the State of Texas have been given special emphasis.

8. Have completed at least six semester hours of American History or three semester hours in American History plus three semester hours in Texas History.

9. Pay an application fee of $3.00.

Course Load for Full-Time Teachers

Full-time teachers may enroll for as much as six semester hours of graduate credit for one semester during an academic year; however, the load of such students shall not exceed nine semester hours for the academic year.

GRADUATE FACULTY

Members

Professor Howard W. Adams
Secondary Education; educational research.

Associate Professor Myrtle Lee Bell
Educational Psychology.

Associate Professor E. B. Blackburn, Jr.
Elementary Education; elementary curriculum.

Professor W. Richard Hargrove
Elementary Education; foundations of education.

Professor M. L. McLaughlin
Elementary Education; contemporary education.

Professor Conrad D. Mang
Elementary Education; educational philosophy.

Associate Professor Thomas T. Salter
Elementary Education; elementary curriculum.

Associate Professor E. Lee Self
Secondary Education; public education.

Associate Professor Monty L. Sontag
Special Education; mental retardation.

The graduate student will select his education courses from the following list:

530—Structure and Organization of Public Education. Analysis of the operation and function of public education at the local, state, and national levels. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

531—Research. Introduction to skills and techniques necessary for research and problem solving in education. Emphasis on terminology, methodology, and spirit of systematic research. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

532—Current Issues in Education. Current controversies and trends in public education. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

533—Contemporary Philosophies of Education. Influence of recent philosophies on education. Schools of educational philosophy and implications for curriculum development and teaching methods. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

534—Advanced Study in Child Psychology. A study of the development and nature of the human personality. Emphasis on recent psychological and biological experiments. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

535—Advanced Educational Psychology. Current theories and developments in the process of learning. Emphasis on motivation, transfer, and learning techniques. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

536—Problems in Teaching the Language Arts and Social Studies. Recent developments and trends with primary consideration given to individual teaching problems and individual research. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

537—The Elementary School Curriculum. Analysis of the objectives, organization, and content of the different areas of the elementary school curriculum. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

538—Problems in Teaching Arithmetic and Science. Study of current developments and trends with emphasis upon individual teaching problems. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

539—Developmental Reading. Methods for extending and refining fundamental reading habits and attitudes, and for increasing reading efficiency. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

5301—Current Literature for Children and Adolescents. Survey of recent literature for children and adolescents. Emphasis given to non-fiction in such areas as earth science and social science. Extensive reading of actual literature. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

5311—Advanced Studies in Mental Retardation. Sociological and educational problems related to mental retardation. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

5312—Occupational Education for the Mentally Retarded. Employment opportunities, job analyses, guidance and placement procedures, agency services. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

5313—Psychology of the Mentally Retarded. Examination of the psychological problems of mental retardation. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

5314—Seminar on the Education of the Mentally Retarded. Study of the sociological and educational problems related to mental retardation. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

5315—Problems and Issues in Special Education. Appraisal of current problems, trends and practices in the education and care of exceptional children. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

5316—Administration and Supervision of Special Education Programs. Organization, financing, staffing and supervision in special education programs. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

669A-669B—Thesis. Prerequisite: admission to candidacy for the Master of Education degree. Credit: 6 semester hours.

SCHOOL OF ENGINEERING

The School of Engineering offers a program of study leading to the Master of Engineering Science degree (M.E.S.). The Department of Mathematics offers the Master of Science degree in Mathematics (M.S.). (See Department of Mathematics, this Catalog.)

The Master of Engineering Science degree plan requires the completion of thirty semester hours of graduate work, including the thesis. For admission to the program, the student must meet the following requirements

1. The general requirements for admission to the Graduate School.

2. Hold a bachelor's degree in a field of engineering or applied science.

3. Have completed mathematics through differential equations.

4. Have completed courses in chemistry and physics, equivalent to those required for undergraduate engineering students at Lamar.

5. Have completed courses in applied mechanics through Mechanics of Materials, Elements of Field Theory, Electronics, Thermodynamics, Materials Science, and Fluid Mechanics.

It is assumed that all graduate students are familiar with digital computers.

Degree Requirements

The candidate for the M.E.S. degree must meet all the Graduate School general degree requirements as listed in this Catalog. Additional specific degree requirements are as follows:

1. A minimum of eighteen semester hours of credit in engineering courses, including the following:

   A. Fifteen semester hours of course work on the 500 level (may include thesis credit).

   B. Three semester hours of graduate engineering courses from those designated as core courses (Egr 531, Egr 533, Egr 535, Egr 537).

   C. Six semester hours in thesis.

2. Complete a minimum of six semester hours in mathematics and at least three semester hours in science from approved senior-graduate courses.

3. All course work presented for the M.E.S. degree must have the approval of the candidate's graduate committee.

GRADUATE FACULTY

Members

Professor Otto G. Brown
   Fluid mechanics in turbulent flow.

Professor Lloyd B. Cherry
   Electronic instrumentation and control.

Professor James L. Cooke
   Control systems.

Professor Floyd M. Crum
   Solid state devices in electronic circuits.

Professor Andre P. DelFlache
   Soil mechanics, micromeritics.

Professor David G. Gates
   Methods engineering, work measurement.

Professor Frederic C. Jelen
   Cost engineering, corrosion.

Professor Robert A. McAllister
   Physical properties and two-phase hydrodynamics.

Associate Professor Harry T. Mei
   Heat transfer and humidity control.

Associate Professor Robinson P. Ramirez
   Elasticity, plasticity, metal and non-metal cutting.

Associate Professor Bruce G. Rogers
   Ultimate load characteristics of structures, stress analysis.

Professor Frank A. Thomas, Jr.
   Thermodynamics and heat transfer.

Professor Richard E. Walker
   Rheology.

Associate Members

Assistant Professor Edwin O. Eisen
   Liquid-liquid equilibria, nuclear engineering.

Assistant Professor Leonard A. Hale
   Heat transfer and change of phase.

   The graduate student will select his courses from the following:

Engineering (Egr)

   *531—Materials Science. Principles underlying the behavior of materials existing in the solid liquid and gaseous phases. Class: 3 hours. Credit: 3 semester hours.

*533—Advanced Engineering Analysis I. Methods of solution of problems drawn from contemporary engineering practice. Methods of mathematical physics including lumped parameter and distributed-parameter problems will be covered. Analog and digital computer techniques will be introduced and employed. Statistical concepts will be employed. Prerequisite: Mth 4301 or equivalent. Class: 3 hours. Credit: 3 semester hours.

534—Nonlinear Analysis. Equations with known solutions. Numerical and graphical methods; use of the phase plane and analysis of singular points. Analytical techniques: perturbation method, variation of parameters, and principle of harmonic balance; describing functions. Forced oscillations and linear equations with varying coefficients. Stability. Prerequisite: Egr 533 recommended. Class: 3 hours. Credit: 3 semester hours.

*535—Control Systems Engineering. Principles and analysis of systems and processes with applications drawn from the various engineering fields. Covers controls, response, stability and compensation. Special topics, which may be varied according to interest, from nonlinear systems, digital systems, statistically described signals and multivariable systems. Prerequisite: Mth 4301. Class: 3 hours. Credit: 3 semester hours.

*537—Energy Conversion. A study of energy forms and their relation to physical systems, including general laws of thermodynamics, quantum mechanics, electric and magnetic phenomena and methods of irreversible thermodynamics. Class: 3 hours. Credit: 3 semester hours.

539—Seminar: Investigation of current engineering research and literature. Written and oral reports will be required. Class: 3 hours. Credit: 3 semester hours.

5311—Transport Phenomena. The fundamental relationships involved in momentum heat and mass transfer. Emphasis is on principles and fundamentals, but applications and analogies are developed extensively. Prerequisite: Mth 4301 or parallel, or Mth 433 or parallel. Class: 3 hours. Credit: 3 semester hours.

5312—Principles of Measurement. The fundamentals of physics, chemistry, and engineering are used to investigate methods for continuously monitoring process variables. The work includes an evaluation of reliability, accuracy, and usefulness for each fundamental application and the means of converting the measurement to signals for conventional or computer control. Class: 3 hours. Credit: 3 semester hours.

5313—Rate Processes. Rates of energy transfer with selected topics in the fields of mechanical, thermal, chemical, electrical, and other energy transformations. Prerequisite: Mth 4301. Class: 3 hours. Credit: 3 semester hours.

5314—Stagewise Processing. All stagewise processing operations such as distillation, extracting, absorption, etc., are treated as simple variations of the same process. Both equilibrium process and non-equilibrium stage

*Core Courses.

process are considered. Multicomponent as well as binary systems are considered. Class: 3 hours. Credit: 3 semester hours.

5315—Advanced Engineering Mechanics. General analysis of stress and strain, equations of equilibrium and compatability, stress strain relations, two dimensional stress problems, elastic energy principles, thermoelastic problems. Class: 3 hours. Credit: 3 semester hours.

5316—Advanced Engineering Economics. The use of advanced mathematical models for optimizing engineering problems with emphasis on management decisions. Includes special techniques based on systems analysis, design of experiments, linear programming, queing, simulation, and probabilistic analysis. Class: 3 hours. Credit: 3 semester hours.

5317—Micromeritics. Shape and size-distribution of particles. Theories of sieving, grading and grinding. Surface properties. Chemical properties. Packing mechanics of particulate matter (statics, dynamics, behavior under stress, thermodynamics). Electrical, optical and sonic properties. Diffusion, transport, collection and separation of small particles. Class: 3 hours. Credit: 3 semester hours.

5318—Experimental Mechanics. Use of reflection and refraction photoelastic apparatus to determine state of stress in opaque and transparent structural models. Demonstration of brittle coating techniques. Comparison of electrical resistance and mechanical strain gages. Investigation of dynamic loading with oscilloscopes and other recording apparatus. Prerequisite: Egr 5315. Class: 2 hours. Laboratory: 3 hours. Credit: 3 semester hours.

5320—Quality Control Systems. Application of statistical methods to industrial problems; regression and correlation theory; analysis of variance; use of control charts for control of manufacturing operations. Class: 3 hours. Credit: 3 semester hours.

5322—Rheology. A study of the fundamentals of non-Newtonian liquid flow and how these principles can be applied to momentum, heat and mass transfer. Emphasis is on principles and fundamentals, but applications to practical problems, including methods of measuring rheological properties, are developed extensively for both non-elastic and elastic liquids. Class: 3 hours. Credit: 3 semester hours.

5324—Wave Mechanics of Particulate Matter. Propagation of elastic waves in semi-infinite media. Surface waves and body waves. Behavior of particulate masses under the effect of dynamic loading, impact and transient phenomena. Effects of vibrations of substructures. Effect on structure of waves from industrial, seismic and nuclear sources. Mechanical and electronic recording. Class: 3 hours. Credit: 3 semester hours.

5325—Information Theory. A study of the principles of signal processing. Specifically, a study is made of information theory of discreet systems; properties of continuous signals; ergodic ensembles and random noise; entropy of continuous distributions; signal space; linear correlation; filtering; and prediction; information aspects of modulation and noise reduction. Class: 3 hours. Credit: 3 semester hours.

5331—Similitude and Model Design. Dimensional analysis, data processes, prediction equations and model design, including a study of distorted and dissimilar models. Models studied include structural fluid flow, thermal, electrical, magnetic, acoustical, and illumination types. Various analogues from second-order ordinary and partial differential equations are also discussed. Prerequisite: Mth 434 recommended. Class: 3 hours. Credit: 3 semester hours.

5391—Work Systems Engineering. Study of current research in methods of engineering and work measurement; work design; work systems, systems of standard data and predetermined motion time data, statistical treatment of work measurement. Prerequisite: IE 338, CHE 320. Class: 2 hours. Laboratory: 3 hours. Credit: 3 semester hours.

669A-669B—Thesis. - Prerequisite: admission to candidacy. Credit: 6 semester hours.

Chemical Engineering (CHE)

4311—Heat Transmission. Process design calculation and process calculations involving the transfer of heat by conduction, convection, and radiation. Steady and unsteady state heat transmission. Prerequisite: Mth 232 and 233. Class: 3 hours. Credit: 3 semester hours.

4312—Filtration. Flow of liquids through homogeneous and non-homogeneous solids, porosity, permeability, constant rate and constant pressure, filtration, variable pressure-variable rate filtration, washing, cycles for maximum production and optimum cost, rotary filtration, and washing. Prerequisite: Egr 331. Class: 3 hours. Credit: 3 semester hours.

4315—Phase Rule. Application of the phase rule to chemical engineering three and four liquid components, and azeotropic distillation. Prerequisite: CHE 333. Class: 3 hours. Credit: 3 semester hours.

4317—Diffusional Operation. Principles of diffusion, boundary layer equations, mass-transfer coefficients, and diffusional operations of chemical engineering. Prerequisite: CHE 442. Class: 3 hours. Credit: 3 semester hours.

4321—Chemical Engineering Economics. Calculations involving process and control as determined by least cost or maximum profit. Based on unit operations and unit processes. Class: 3 hours. Credit: 3 semester hours.

4322—Advanced Unit Operations. The application of chemical engineering fundamentals to special problems selected for advanced study. Prerequisite: CHE 442. Class: 3 hours. Credit: 3 semester hours.

4323—Corrosion and Materials of Construction. Construction materials and corrosion in the chemical and petroleum industry. Class: 3 hours. Credit: 3 semester hours.

4325—Introduction to Nuclear Engineering. A study of the engineering aspects of nuclear fundamentals and processes. Class: 3 hours. Credit: 3 semester hours.

4329—Properties of Gases and Liquids. A critical review of various estimation and correlation procedures for a number of physical properties of pure gases and liquids. Though the subject matter is tied closely to basic theory, its intrinsic value results from its utility in almost every chemical or petroleum industry. Class: 3 hours. Credit: 3 semester hours.

Civil Engineering (CE)

430—Indeterminate Structures. Basic principles of statically indeterminate structural analysis, based upon requirements of equilibrium and continuity. Classical methods of strain energy, slope deflection and moment distribution used for analysis of frames, trusses and beams. Prerequisite: CE 334. Class: 3 hours. Credit: 3 semester hours.

433—Sanitation II. Introduction to the sanitation phase of public health work; communicable diseases, water and sewage treatment, food sanitation, industrial sanitation, swimming pool sanitation, refuse sanitation. Laboratory consists of laboratory tests and field trips. Prerequisite: CE 337. Class: 2 hours. Laboratory: 3 hours. Credit: 3 semester hours.

435—Advanced Sanitation. Advanced studies in sanitary microbiology and chemistry; enzymes, metabolic reactions, energy, synthesis, growth and death. Microbiology as applied to water, wastes, and biological treatment. Laboratory consists of physical, chemical and biological tests on streams, bench-scale plants, and actual water and waste water plants. Prerequisite: CE 337. Class: 2 hours. Laboratory: 3 hours. Credit: 3 semester hours.

4311—Plastic Design. Plastic methods of analysis applied to continuous frames, bents and girders. Consideration of load and shape factors. Strueural behavior in the plastic range. Prerequisite: CE 430. Class: 3 hours. Credit: 3 semester hours.

4313—Foundation Engineering. Principles of soil science applied to the design of rigid and elastic foundations. Spread footings, floating foundations, retaining walls, pile structures and caissons. Prerequisite: CE 434. Class: 2 hours. Laboratory: 3 hours. Credit: 3 semester hours.

4316—Soil Dynamics. Detailed study of mechanical properties of soil masses under the effect of dynamic loading, impact and shock wave propagation. Seismic phenomena, their reflection and refraction. Electronic recording and analysis of experimental transient data. Prerequisite: Geo 433. Class: 2 hours. Laboratory: 3 hours. Credit: 3 semester hours.

Electrical Engineering (EE)

432—Electronics III. Tuned voltage and power amplifiers, oscillators, rectifiers with associated filters and regulators, modulation and demodulation (detection), relaxation oscillators, sweep generators, and electronic instruments. Prerequisite: EE 431. Class: 3 hours. Credit: 3 semester hours.

434—Transient Analysis of Circuits. The fundamental principles of transient circuit analysis by using the Laplace Transform method of solving the circuit differential equations. Prerequisite: EE 317, 431, and Mth 232. Class: 3 hours. Credit: 3 semester hours.

436—Control Engineering. Introduction; the Laplace transformation transform functions; time response; frequency response; stability; design and compensation; special topics as time permits. Prerequisite: EE 435. Class: 3 hours. Credit: 3 semester hours.

437—Micro-Wave. A study of micro-wave generation, transmission, and detection. Includes a treatment of motion of electrons in microwave devices and specific tubes such as klystrons, traveling-wave tubes, and magnetrons. Consideration is given measurements and measuring devices at these frequencies. Parallel: EE 431, and EE 433. Class: 3 hours. Credit: 3 semester hours.

Industrial Engineering (IE)

4313—Human Engineering. The specialized adaptation of engineering designs to meet human physiological and psychological needs. Prerequisite: IE 338 or permission of instructor. Class: 2 hours. Laboratory: 3 hours. Credit: 3 semester hours.

4315—Organization and Management. Theory of the organization, the relationship of human efforts for effective and efficient coordinated activity. Investigation of the executive functions; planning, decision-making, policy formation, motivation, communication, control. Class: 3 hours. Credit: 3 semester hours.

Mechanical Engineering (ME)

432—Mechanical Vibrations. The theory of vibrating systems, including kinematics of vibrations, harmonic and non-harmonic, single and multiple degrees of freedom; free and forced vibrations, with and without damping. Application to crank and slider, rotating machinery; balancing, vibration, isolation and absorption, and instrumentation. Prerequisite: ME 334 or parallel, and ME 332. Class: 3 hours. Credit: 3 semester hours.

433—Aerodynamics. Topics include circulation and curl, irrotational flow, velocity, potential, vortex theorems, the equation of motion, flow about a body, and the thin airfold. Vector and complex notation is used. Prerequisite: ME 321 or parallel, or Egr 332 or parallel. Class: 3 hours. Credit: 3 semester hours.

439—Advanced Strength of Materials. Introduction to the fundamental theory of three dimensional elasticity. Specialization of the general theory to provide the theory of plane stress and plane strain. Determination of stress and deflections in a beam on elastic foundation, plates, shells, and cylinders. Study of torsion of bars and cylinders. Prerequisite: ME 334. Class: 3 hours. Credit: 3 semester hours.

4311—Controls Engineering. The theory of integrated automatic control systems with application to combustion, temperature, pressure, flow and humidity control. Industrial control systems are considered. Prerequisite: ME 322 or Egr 332. Class: 3 hours. Credit: 3 semester hours.

4313—Heat Transfer. Advanced theory and application of heat transfer for various boundary conditions. Conduction, convection, and radiation are considered. Prerequisite: ME 420 or Egr 332. Class: 3 hours. Credit: 3 semester hours.

4314—Fundamentals of Physical Metallurgy. Fundamental and scientific principles of physical metallurgy to include nucleation theory of solidification, behavior of single and polycrystalline solids under stress and heat treatment—plastic deformation and recrystallization, and basic principles of X-ray diffraction used in physical metallurgy. Prerequisite: ME 4319 or parallel. Class: 3 hours. Credit: 3 semester hours.

DEPARTMENT OF ENGLISH

Degree Requirements

The degree of Master of Arts in English requires the completion of thirty semester hours of graduate work: eighteen in English, six in thesis, and six in an approved minor or six additional hours in English. At least twelve semester hours, exclusive of the thesis, must be in English courses numbered 500 or above. The minor must be approved by the Head of the Department of English; such approval will be given on the basis of the support the minor can give to the major.

Professional Certification Requirements (Texas) in English

The plan for the Professional Certificate—Secondary requires the completion of thirty semester hours of graduate work: eighteen in English, six in resource areas, and six in approved teacher education. At least twelve semester hours must be in English courses numbered 500 or above. The courses in the resource areas must be approved by the Head of the Department of English; such approval will be given on the basis of the support they can give to the major and on the specific needs of the graduate student. The six semester hours of teacher education must be taken in courses specifically approved for the Professional Certificate—Secondary.

Depending on the student's undergraduate course work, his graduate program in English will normally include English 530 and at least three semester hours in each of the following categories:

1. English Language and Literature prior to 1500

2. English Literature: 1500-1800

3. English Literature: 1800 to present

4. American Literature

GRADUATE FACULTY

Members

Associate Professor Francis E. Abernethy
    Renaissance literature, Folklore.

Professor Robert J. Barnes
    British and Continental literature: 1840 to the present.

Professor Winfred S. Emmons, Jr.
    Middle English language and literature, American literature.

Professor Harry L. Frissell
    Renaissance and seventeenth century British literature.

Professor Charles W. Hagelman, Jr.
    Nineteenth century British and American literature.

Professor Robert C. Olson
Old English language and literature, eighteenth century British literature.

Professor Henry B. Rule
American literature: 1840 to the present.

Associate Professor A. W. Yeats
British literature: 1840 to the present.

Associate Members

Assistant Professor Jack N. Renfrow
Renaissance literature.

Assistant Professor R. Blaine Thomas
Eighteenth century British literature.

The graduate student will select his English courses from the following list:

430—History of the English Language. Theory and nature of language. Studies in the growth of British and American forms. Prerequisite: Foreign language through 232. Class: 3 hours. Credit: 3 semester hours.

431—Chaucer. A study of the poetry and language of Chaucer with emphasis on the **Canterbury Tales.** Class: 3 hours. Credit: 3 semester hours.

432—The Age of Elizabeth. The non-dramatic literature of England from Skelton to Donne. Class: 3 hours. Credit: 3 semester hours.

433—The Age of Elizabeth. The dramatic literature of England, exclusive of Shakespeare, from Heywood to Ford. Class: 3 hours. Credit: 3 semester hours.

434—Shakespeare. Intensive study of selected major plays. Class: 3 hours. Credit: 3 semester hours.

435—The Seventeenth Century. The non-dramatic literature of England from the Metaphysical poets to Dryden. Class: 3 hours. Credit: 3 semester hours.

436—Milton. A study of Milton's poetry and prose against the social, political, and literary background of his time. Class: 3 hours. Credit: 3 semester hours.

437—Restoration and Eightenth Century Drama. A study of the plays of the period: 1660-1800. Class: 3 hours. Credit: 3 semester hours.

438—The Eighteenth Century. The poetry and prose in England from the Restoration to the rise of Romanticism. Class: 3 hours. Credit: 3 semester hours.

439—The Romantic Period. An intensive study of the major authors of the period from Burns to Keats. Class: 3 hours. Credit: 3 semester hours.

4311—The Victorian Period. An intensive study of the major authors of the period from Carlyle to Swinburne. Class: 3 hours. Credit: 3 semester hours.

4313—The American Literary Renaissance: 1820-1860. An intensive study of the major authors of the period from Poe to Melville. Class: 3 hours. Credit: 3 semester hours.

4314—The Development of American Realism: 1860-1900. An intensive study of the major authors of the period from Whitman to Norris. Class: 3 hours. Credit: 3 semester hours.

4316—Literary Criticism. Chronological study of the great critics. An introduction to aesthetics. Prerequisite: senior standing. Class: 3 hours. Credit: 3 semester hours.

4317—Contemporary Drama. A study of dramatic trends and representative plays from Ibsen to the present. Class: 3 hours. Credit: 3 semester hours.

4318—Contemporary Poetry. A study of poetic developments in England and America with emphasis on representative poets from Hardy to the present. Class: 3 hours. Credit: 3 semester hours.

4319—Contemporary Fiction. A study of prose fiction representative of modern ideas and trends, with emphasis on English and Continental authors. Class: 3 hours. Credit: 3 semester hours.

4321—Selected Problems in Comparative Literature. Intensive study of an author or authors, literary genre, or period selected from the range of world literature. Emphasis upon analysis and literary method. Class: 3 hours. Credit: 3 semester hours.

530—Bibliography and Research Methods. An introduction to graduate research methods and sources. Basic course for all beginning graduate students. Prerequisite: graduate standing. Class: 3 hours. Credit 3 semester hours.

531—Old English. A study of the grammar and the reading of short selections from the poetry and prose written before 1200. Emphasis will be placed on vocabulary and the historical development of the language. Prerequisite: graduate standing and English 430 (History of the Language) or the equivalent. Class 3 hours. Credit: 3 semester hours.

532—Middle English. A study of the grammar and the reading of short selections from literature of the period, 1200-1450. Emphasis will be placed on the development of the language into Modern English. Prerequisite: graduate standing and English 431 (Chaucer) or the equivalent. Class: 3 hours. Credit: 3 semester hours.

534—Studies in Medieval English Literature. An intensive study of an author or related authors selected from the Old English and Middle English

periods. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

535—Studies in Renaissance and Seventeenth Century English Literature. An intensive study of an author or related authors selected from the period. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

536—Studies in Restoration and Eighteenth Century English Literature. An intensive study of an author or related authors selected from the period. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

537—Studies in Nineteenth Century English Literature. An intensive study of an author or related authors selected from the period. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

538—Studies in Twentieth Century Literature. An intensive study of an author or related authors selected from the period. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

539—Studies in American Literature. An intensive study of an author or related authors selected from the period. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

669A-669B—Thesis. Prerequisite: admission to candidacy for the master's degree. Credit: 6 semester hours.

DEPARTMENT OF HISTORY

Degree Requirements

The degree of Master of Arts in History requires the completion of thirty semester hours of graduate work: eighteen in history, six in thesis, and six in an approved minor or six additional hours in history. At least twelve semester hours, exclusive of the thesis, must be in history courses numbered 500 or above. The minor must be approved by the Head of the Department of History; such approval will be given on the basis of the support the minor can give to the major.

Professional Certification Requirements (Texas) in History

The plan for the Professional Certificate—Secondary requires the completion of thirty semester hours of graduate work: eighteen in history, six in resource areas, and six in approved teacher education. At least twelve semester hours must be in history courses numbered 500 or above. The courses in the resource areas must be approved by the Head of the Department of History; such approval will be given on the basis of the support they can give to the major and on the specific needs of the graduate student. The six semester hours of teacher education must be taken in courses specifically approved for the Professional Certificate—Secondary.

Depending on the student's undergraduate course work, his graduate program in history will normally include History 530, one seminar, and one sources and literature course.

GRADUATE FACULTY

Members

Associate Professor Paul E. Isaac
    United States history; recent; the West.

Associate Professor Howard Mackey
    Modern European history; Great Britain.

Associate Professor L. Wesley Norton
    United States history; social and intellectual.

Professor Preston B. Williams
    Modern European history; Central and Western Europe.

Professor Ralph A. Wooster
    United States history; Civil War; the South.

The graduate student will select his history courses from the following list:

430—Era of the Renaissance and Reformation. Western Europe from 1453 to 1610. Class: 3 hours. Credit: 3 semester hours.

431—**The Old Regime.** Western Europe from 1610 to 1783. Class: 3 hours. Credit: 3 semester hours.

432—**The French Revolution and Napoleon.** Western Europe from 1783 to 1815. Class: 3 hours. Credit: 3 semester hours.

433—**Russia and Eastern Europe to 1825.** Russia, Poland, and the Balkans from the period of the Byzantine Empire to 1825. Class: 3 hours. Credit: 3 semester hours.

434—**Nineteenth Century Europe.** Europe from 1815 to 1914. Class: 3 hours. Credit: 3 semester hours.

435—**Twentieth Century Europe.** Europe since 1914. Class: 3 hours. Credit: 3 semester hours.

436—**The American West.** The American West from the Louisiana Purchase to the present. Class: 3 hours. Credit: 3 semester hours.

437—**The American South.** The American South from colonial times to the present. Class: 3 hours. Credit: 3 semester hours.

4311—**Colonial America.** Class: 3 hours. Credit: 3 semester hours.

4312—**The American Revolution.** Class: 3 hours. Credit: 3 semester hours.

4313—**The Age of Jackson.** Class: 3 hours. Credit: 3 semester hours.

4314—**The American Civil War.** Class: 3 hours. Credit: 3 semester hours.

4315—**Reconstruction and Industrialization: The United States from 1865 to 1898.** Class: 3 hours. Credit: 3 semester hours.

4316—**World Power and Reform: The United States from 1898 to 1929.** Class: 3 hours. Credit: 3 semester hours.

4317—**New Deal and World Leadership: The United States Since 1929.** Class: 3 hours. Credit: 3 semester hours.

4318—**Classical Civilization.** Greece and Rome from earliest times to the fall of the Roman Empire in the West. Class: 3 hours. Credit: 3 semester hours.

4319—**Medieval Civilization.** Western Europe and the Mediterranean area from the late Roman period to 1453. Class: 3 hours. Credit: 3 semester hours.

4325—**Tudor and Stuart England.** England from 1485 to 1688. Class: 3 hours. Credit: 3 semester hours.

4326—**Eighteenth Century England.** England (Great Britain) from 1688 to 1815. Class: 3 hours. Credit: 3 semester hours.

4327—Victorian England. Great Britain from 1815 to 1914. Class: 3 hours. Credit: 3 semester hours.

4323—Latin America to 1810. Class: 3 hours. Credit: 3 semester hours.

4324—Latin America Since 1810. Class: 3 hours. Credit: 3 semester hours.

530—History of Historical Writing. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

531—Sources and Literature of Early United States History. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

532—Sources and Literature of Recent United States History. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

533—Sources and Literature of Modern European History. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

534—Sources and Literature of Modern British History. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

535—Seminar in Texas History. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

536—Seminar in Southern History. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

537—Seminar in Early United States History. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

538—Seminar in Recent United States History. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

539—Seminar in the American West. Course may be repeated for a maximum of six semester hours credit when the topic varies. Prerequisite: graduate standing. Class: 3 hours. Credit: 3 semester hours.

669A-669B—Thesis. Prerequisite: admission to candidacy for the master's degree. Credit: 6 semester hours.

DEPARTMENT OF MATHEMATICS

The Department of Mathematics offers a program of study leading to the Master of Science degree in Mathematics (M.S.). Those seeking admission to this program must meet the general requirements as set forth in this Catalog for admission to the Graduate School. In addition, the applicant's twenty-four semester hours of undergraduate work in mathematics must include a course in advanced calculus or its equivalent.

Degree Requirements

The Master of Science degree in mathematics requires the completion of thirty semester hours of graduate work of which eighteen semester hours must be in courses listed 500 or higher.

Additional specific degree requirements are as follows:

1. Fifteen to eighteen semester hours in mathematics, including nine semester hours of graduate courses (exclusive of thesis).

2. Six semester hours in thesis.

3. Six to nine semester hours in a minor field. Minor field must be approved by the head of the department.

GRADUATE FACULTY

Members

Professor Jeremiah M. Stark
  Analysis and Applied Mathematics.

Associate Professor Wade Lee Allen
  Topology and Modern Algebra.

Associate Professor Philip W. Latimer
  Analysis and Modern Elementary Mathematics.

The graduate student will select his courses in mathematics from the following:

4302—**Advanced Calculus for Engineers.** Boundary-value problems, orthogonal functions, introduction to vector analysis and functions of a complex variable, partial differential equations of mathematical physics. Class: 3 hours. Credit: 3 semester hours.

431, 432—**Introduction to Functions of a Complex Variable.** Review of theorems from analysis and point set theory followed by a study of analytic functions from the Caunchy-Riemann and Weierstrass points of view. Compact sets, uniform convergence, Taylor Expansion Theorem, analytical continuation, Laurent expansions, calculus of residues, conformal mapping. Class: 3 hours. Credit: 3 semester hours.

433—Vector Analysis. The algebra and calculus of vectors with applications. Scalar and vector fields, operators, Green's, Stokes', and Divergence Theorems, curvilinear coordinates. Other topics as time permits. Class: 3 hours. Credit: 3 semester hours.

434—Partial Differential Equations. General and particular solutions, boundary conditions, Fourier series, Bessel functions, harmonic analysis, numerical solutions, condition of heat, flow of electricity. Class: 3 hours. Credit: 3 semester hours.

435—Introductory Topology. Topological spaces, metric spaces, product spaces, connected spaces, and compact spaces. Open sets, closed sets, limit points, closure, interior, boundary, continuity, homeomorphism, subspaces, components, and open coverings. Some applications to analysis. Class: 3 hours. Credit: 3 semester hours.

4311—Numerical Solution of Differential Equations. Analytical foundations. Methods for ordinary and partial differential equations. Class: 3 hours. Credit: 3 semester hours.

531—Theory of Functions of Real Variable. Analytical functions, pathological functions, set functions, Riemann integral, measure theory, Lebesque integral, Riemann-Stieltjes and Lebesque-Stieltjes integral. Class: 3 hours. Credit: 3 semester hours.

532—Modern Algebra. Numbers, sets, rings, fields, polynomials, and the theory of fields. The theory of fields includes the study of subfields, prime fields, simple field extensions, algebraic field extensions, and Galois fields. Class: 3 hours. Credit: 3 semester hours.

533—Calculus of Variations. The Euler-Lagrange differential equation, necessary conditions of Legendre, Jacobi, and Weierstrass, sufficient conditions for an extreme, brachistrochrone problem, geodesics, surface of revolution of minimum area, other problems as time permits. Class: 3 hours. Credit: 3 semester hours.

534—Topology. Sets, compact spaces, topological spaces, embedding and metrization, and Urysohn lemma. Uniform spaces and function spaces as time permits. Class: 3 hours. Credit: 3 semester hours.

535—Introduction to Advanced Analysis. The Riemann mapping theorem, prime number theorem, functions of finite order, Turan's proof of Fabry gap theorem, other topics as time permits. Prerequisite: Mth 431. Class: 3 hours. Credit: 3 semester hours.

536—Integral Equations. Fredholm theory. Eigenvalues and eigenfunctions. Volterra integral equation. Degenerate, symmetric, resolvent, iterated, and arbitrary kernels. Neumann series. Use of integral equations theory as a unified approach to boundary value problems, differential equations, and potential theory. Class: 3 hours. Credit: 3 semester hours.

537—Methods of Applied Mathematics. The Dirichlet problem, solution of boundary-value problems, the Bergman kernel function, method of the minimum integral, applications of conformal mapping. Prerequisite: Mth 431. Class: 3 hours. Credit: 3 semester hours.

539—Infinite Series. Sequences, power series, series of functions, complex series, expansion of functions, tests for convergence, uniform convergence, conditions for rearranging terms in a series, Fourier series, Lambert series, Weierstrass theorem on double series, asymptotic expansions, summation of series. Class: 3 hours. Credit: 3 semester hours.

669A-669B—Thesis. Prerequisite: admission to candidacy for the master's degree. Credit: 6 semester hours.

For Non-Mathematics Majors

530—Seminar in Mathematics for Teachers. A review of basic mathematics through description and problem solving techniques. May not be taken for credit by science, engineering, or mathematics students. Class: 3 hours. Credit: 3 semester hours.

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Master of
Business Administration Degree
(MBA)

A Master of Business Administration degree will be instituted at Lamar State College of Technology at the beginning of the fall semester, 1965. Persons seeking admission to this program must meet the general requirements for admission that are outlined in the Graduate Catalog. An applicant must also have completed the substantial equivalent of the following undergraduate courses in business: accounting, six semester hours; business law, three semester hours; business statistics, three semester hours; principles of economics, six semester hours; industrial management, three semester hours; principles of marketing, three semester hours; principles of finance, three semester hours; business communications, three semester hours.

SPECIFIC DEGREE REQUIREMENTS

The Master of Business Administration degree requires the completion of thirty semester hours of graduate work including the thesis. Specific degree requirements in addition to the general requirements specified in the catalog are as follows:

1. Undifferentiated Business Courses - six semester hours selected from the following are required.

   BA   530--Seminar in Management
   BA   531--Seminar in Marketing
   BA   532--Problems in Business Finance
   Acc   534--Seminar in Accounting
   BA   5310-Advanced Statistical Analysis

2. Specialization - six semester hours selected from the following courses:

   Acc   536--Advanced Accounting Problems
   Acc   537--Managerial Accounting
   BA   538--Business Problems and Organization
   BA   539--Quantitative Analysis Control

3. Six hours Thesis

   669A-669B--Thesis in Business Administration

4. Six hours selected from the following courses in economics:

    Eco   430--Government and Business
    Eco   436--Business Cycles
    Eco   437--Intermediate Theory
    Eco   438--Macro Economics
    Eco   4370-Seminar in Economic Problems
    Eco   4371-Managerial Economics

5. Approved electives - six semester hours

REQUIREMENTS FOR APPLICANTS WITH DEGREES IN NON-BUSINESS FIELDS

Students whose baccalaureate degree are in non-business fields may earn the Master of Business Administration degree by completing sixty semester hours of work in the School of Business.   The first year of work (30 semester hours) will consist of the following undergraduate core courses or their equivalents.   Descriptions of these courses may be found in the undergraduate catalog of this institution.

    Acc   231 and 232 - Principles of Accounting
    BA   331 - Business Law
    BA   332 - Principles of Finance
    BA   334 - Marketing
    BA   335 - Industrial Management
    BA   431 - Business Statistics
    Eco   231 and 232 - Principles of Economics
    Business Communications - 3 semester hours

Requirements for the second year of work leading to the MBA degree for non-business majors are as outlined above for business graduates.

COURSE DESCRIPTIONS

Accounting (Acc)

Acc 534--Seminar in Accounting. A course designed to broaden the student's concepts of current accounting theory and problems. Class: 3 hours. Credit: 3 semester hours.

Acc 536--Advanced Accounting Problems. An intensive study of accounting techniques and problems with emphasis placed on the concepts of income determination, asset valuation, and cost analysis. Contemporary developments are reflected through a study of research materials and professional publications. Class: 3 hours. Credit: 3 semester hours.

Acc 537--Managerial Accounting. Application of accounting data in decision-making; cost analyses as applied in the development of budgets and standards; accounting as a tool for cost control and pricing; case problems. Class: 3 hours. Credit: 3 semester hours.

Business Administration (BA)

BA 530--Seminar in Management. A course designed to broaden students' concept of the field of management other than functional specialization; analysis of present and possible future problems in organization; labor-management relations; governmental and organizational relationships; responsibility of management, local and national. The student's ability to analyze, judge trends, and consider varying influences is developed through practice with actual cases. Research papers are presented by each student for critical analysis and discussion. Class: 3 hours. Credit: 3 semester hours.

BA 531--Seminar in Marketing. An intensive study of specific marketing problems with emphasis on research methodology and marketing problems; a critical evaluation of research procedures and utilization of research findings; promotional programs. Prerequisite: approval of professor. Class: 3 hours. Credit: 3 semester hours.

BA 532--Problems in Business Finance. A comprehensive study of how financial problems affect all areas of business management. The case study approach is utilized in order to stimulate analysis and discussion of forms of organization, promotion of new firms, short-term and long-term sources of funds and financing, dividend policies, mergers, refinancing and recapitalzation, reorganization, and comprehensive financial planning. Class: 3 hours. Credit: 3 semester hours.

BA 538--Business Problems and Organization. Managerial decision-making in the areas of marketing, finance, production, and labor-management relations. General management perspectives and stressed in determining objectives, establishing policies, and planning and organizing the use of facilities, materials, and manpower; motivation of individuals and groups. The case-study approach is utilized. Class: 3 hours. Credit: 3 semester hours.

BA 539--Quantitative Analysis Control. A course designed to cover the interrelationships of production, distribution, and finance. The problems and situations confronting top and middle management are critically examined. Quantitative tools and techniques of accounting, statistics, and mathematics are employed to provide a framework for analysis and decision-making. Prerequisite: approval of professor. Class. 3 hours. Credit: 3 semester hours.

BA 5310--Advanced Statistical Analysis. Further development of the application of statistical methods to the process of making decisions in the face of uncertainty. The use of quantitative methods and models for management is emphasized. Topics include multiple correlation, sampling theory, queing theory, and statistical quality control. Prerequisite: BA 432 and mathematical competence. Class: 3 hours. Credit: 3 semester hours.

Economics (Eco)

Eco 430--Government and Business. Regulation and restriction of business enterprises by government. Regulatory bodies; anti-trust laws; public utilities; transportation; government ownership. Class: 3 hours. Credit: 3 semester hours.

Eco 436--Business Cycles. The nature and causes of business cycles. Cyclical theories; business fluctuations; forecasting stabilization; current problems. Class: 3 hours. Credit: 3 semester hours.

Eco 437--Intermediate Theory. Economic analysis and methodology. Distribution theory; price theory; imperfect competition and monopoly; national income analysis. Class: 3 hours. Credit: 3 semester hours.

Eco 438--Macro Economics. A descriptive-analytical approach to the dynamic forces that influence the aggregate level of economic activity. Income and employment determinants; levels of income and employment; stabilization theory; investment and income relationship; monetary and fiscal policies. Class: 3 hours. Credit: 3 semester hours.

Eco 4370--Seminar in Economic Problems. An advanced level survey of current economic problems, methods, and empirical studies. Subject matter will be varied from semester to semester and will encompass the field of economic inquiry. Class: 3 hours. Credit: 3 semester hours.

Eco 4371--Managerial Economics. A study in depth of the principles and techniques of economic analysis applicable to the problems of business management; demand analysis and forecasting; costing; pricing; capital budgeting and related problems. Class: 3 hours. Credit: 3 semester hours.

HOW TO ENTER THE GRADUATE SCHOOL AT LAMAR

1. Complete two application blanks and mail to the appropriate address.

2. Ask the Registrar of each college that you attended to send a transcript to the Dean of the Graduate School.

3. Have Graduate Record Examination scores (aptitude section and the appropriate subject area) sent to the Dean of the Graduate School.

4. Make preliminary arrangements with head of major department concerning program of study. This may be done in person or by correspondence.

5. If college housing is desired, mail request that is attached to this catalog.