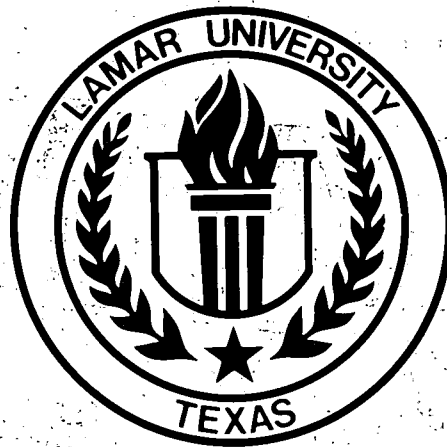




LAMAR UNIVERSITY
TECHNICAL ARTS CATALOG 84•85



Entrance tests are being considered for admission to some of the programs in the College of Technical Arts. All prospective students are encouraged to take the SAT prior to enrollment.



Lamar University

College of Technical Arts

1984-85 Bulletin

Vol. 32 No. 3

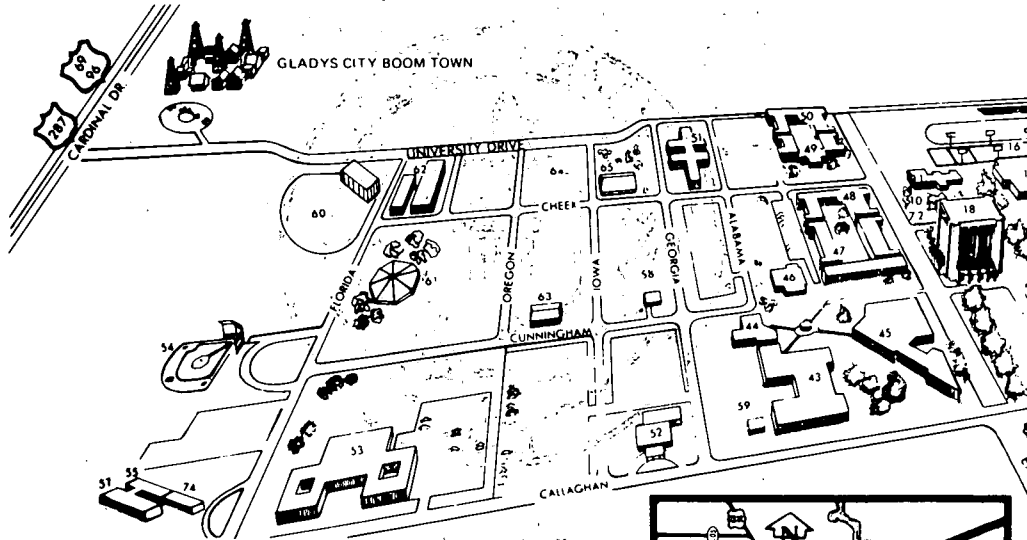
Fifteenth annual catalog issued with announcements for 1984-85.

Founded in 1923, and established as a four-year coeducational state-supported college on September 1, 1951.

The provisions of this bulletin do not constitute a contract, expressed or implied, between any applicant, student, and faculty member in Lamar University. Lamar University reserves the right to withdraw courses at any time, change fees, calendars, curricula, graduation procedures, and any other requirement affecting students. Changes become effective when the proper authorities so determine the application to both prospective students and to the students already enrolled. For additional and complete information refer to the Lamar University General Bulletin.

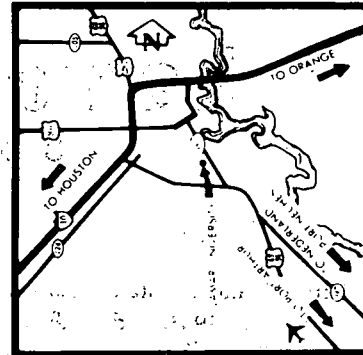
Lamar University is an equal opportunity/affirmative action educational institution and employer. Students, faculty and staff members are selected without regard to their race, color, creed, sex, or national origin, consistent with the Assurance of Compliance with Title VI of the Civil Rights Act of 1964; Executive Order 11246 as issued and amended; Title IX of the Education Amendments of 1972, as amended; Section 504 of the Rehabilitation Act of 1973. Inquiries concerning application of these regulations may be referred to the Executive Associate to the President.

Bulletin of Lamar University. (USPS 074-420). Third class postage paid at Beaumont, Texas 77710. Published monthly except in June, July and August.



Register of Offices

Visitor Information Bldg. 66	Housing 72
Academic Deans (By Colleges)	KVLU-FM Radio 23
Arts & Sciences 43	Operations and Planning 1
Business 9	Parking and Traffic 70
Education 44	Photographic Services 45
Engineering 45	Placement Center 77
Fine and Applied Arts 22	President 1
Graduate Studies 1/3	Print Shop/QC/SC/WPC 73
Health & Behav. Sciences 33	Public Information 1
Technical Arts 39	Purchasing Agent 1
Admissions and Records 3	Research and Programs 32
Alumni Association 50	Spindletop Museum 57
Computer Center 45	Student Aid (Financial) 3
Continuing Education 53	University Police 75
Counseling and Testing 31	University Pres./Cardinal 6
Development 1	Veterans' Affairs 3
Educational Services 55	Vice-Presidents 1
Employment Office 69	Academic Affairs
Evening Classes 3	Finance
Gray Institute 61	University Relations
High School Relations 3	Student Affairs 3

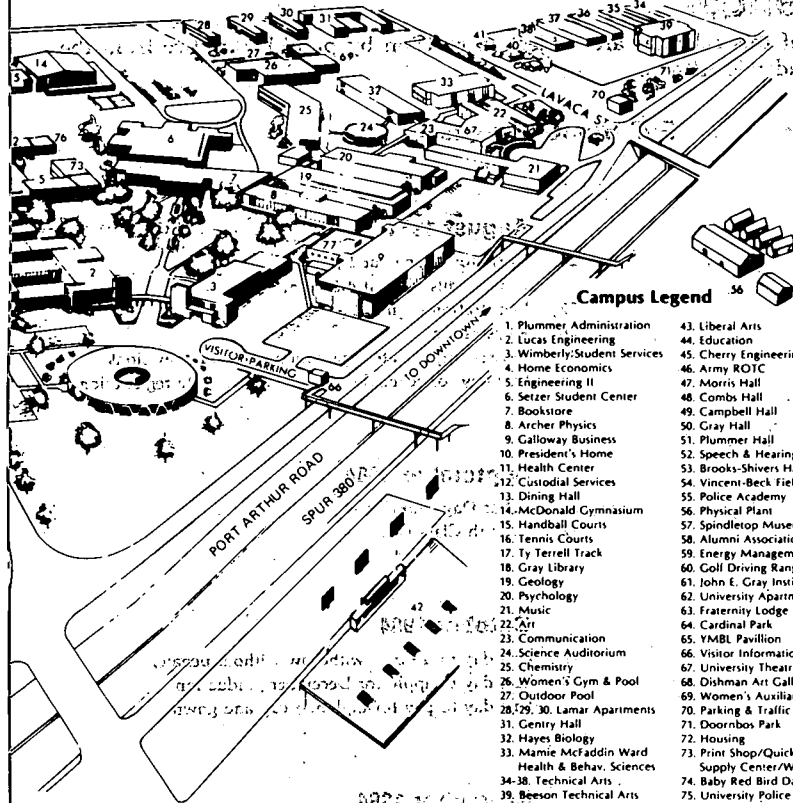


The Campus

Lamar University's campus has expanded rapidly during the past decade and now encompasses some 200 acres.

The Cecil Beeson Technical Arts Building and several other buildings have been completed recently. The University also has campuses in Orange and Port Arthur.

Guidelines for future expansion of the Beaumont campus are included in a conceptual master plan which will guide development into the year 2000. A large portion of the master plan has been approved by the University's Board of Regents.



Campus Legend

- | | |
|--|---|
| 1. Plummer Administration | 43. Liberal Arts |
| 2. Lucas Engineering | 44. Education |
| 3. Wimberly Student Services | 45. Cherry Engineering |
| 4. Home Economics | 46. Army ROTC |
| 5. Engineering II | 47. Morris Hall |
| 6. Seizer Student Center | 48. Combs Hall |
| 7. Bookstore | 49. Campbell Hall |
| 8. Archer Physics | 50. Gray Hall |
| 9. Galloway Business | 51. Plummer Hall |
| 10. President's Home | 52. Speech & Hearing Center |
| 11. Health Center | 53. Brooks-Shivers Hall |
| 12. Custodial Services | 54. Vincent-Beck Field |
| 13. Dining Hall | 55. Police Academy |
| 14. McDonald Gymnasium | 56. Physical Plant |
| 15. Handball Courts | 57. Spindletop Museum |
| 16. Tennis Courts | 58. Alumni Association |
| 17. Ty Terrell Track | 59. Energy Management Ctr. |
| 18. Gray Library | 60. Golf Driving Range |
| 19. Geology | 61. John E. Gray Institute |
| 20. Psychology | 62. University Apartments |
| 21. Music | 63. Fraternity Lodge |
| 22. Art | 64. Cardinal Park |
| 23. Communication | 65. YMBL Pavilion |
| 24. Science Auditorium | 66. Visitor Information |
| 25. Chemistry | 67. University Theatre |
| 26. Women's Gym & Pool | 68. Dishman Art Gallery |
| 27. Outdoor Pool | 69. Women's Auxiliary |
| 28, 29, 30. Lamar Apartments | 70. Parking & Traffic |
| 31. Gentry Hall | 71. Doornbos Park |
| 32. Hayes Biology | 72. Housing |
| 33. Mamie McFaddin Ward Health & Behav. Sciences | 73. Print Shop/Quick Copy/Supply Center/WPC |
| 34-38. Technical Arts | 74. Baby Red Bird Day Care |
| 39. Beeson Technical Arts | 75. University Police |
| 40. Employment Office | 76. Post Office |
| 41. Campus Planning | 77. Placement Center |
| 42. Cardinal Stadium | |

Architects have placed strong emphasis upon developing a feeling of "monumentality and dignity" with the library as the dominant focus of the campus. The 20-year plan shows the addition of multi-storied buildings.

1984-85 Calendar

Published dates of this calendar are subject to revision by published notice from the Vice President for Academic Affairs.

Fall Semester—1984

August 1984

- 26 Dormitories open at 1 p.m.
Dining halls open at 4:30 p.m.
- 27 Registration begins
- 28 Registration
- 30 Classes begin—late registration—schedule revisions
- 31 Last day for schedule revisions and/or late registration

September 1984

- 3 Labor Day—no classes
- 17 Twelfth Class Day

October 1984

- 11 Last day to drop or withdraw without penalty
- 18 Last day to apply for December graduation
Last day to pay for diploma; cap and gown

November 1984

- 16 Last day to drop or withdraw
- 21 Thanksgiving recess begins at 10 p.m.
Dining halls close at 6 p.m.
Dormitories close at 6 p.m.
- 25 Dormitories open at 1 p.m.
Dining halls open at 4:30 p.m.
- 26 Classes resume at 8 a.m.

December 1984

- 12-18 Final examinations
- 19 Dining halls close at 10 a.m.
Dormitories close at 12 noon
- 20 Grades for Graduating seniors due by 8:30 a.m.
All grades due by 4 p.m.
- 21 Associate Degree Commencement (subject to change)
- 22 Baccalaureate and Graduate Degree Commencement

Spring Semester—1985

January 1985

- Dormitories open at 1 p.m.
- Dining halls open at 4:30 p.m.
- Registration begins
- Registration
- Classes begin—late registration—schedule revisions
- Schedule revisions late registration
- Last day for schedule revisions and/or late registration
- Twelfth Class Day

February 1985

- Last day to drop or withdraw without penalty
- Last day to apply for May graduation
- Last day to pay for diploma, cap and gown

March 1985

- Spring recess begins at 5 p.m.
- Dining halls and dormitories close at 6 p.m.
- Dormitories open at 1 p.m.
- Dining halls open at 4:30 p.m.
- Classes resume at 8 a.m.

April 1985

- Last day to drop or withdraw
- Good Friday—No classes

May 1985

- Final examinations
- Dining halls close at 10 a.m.
- Dormitories close at 12 noon
- Grades for graduating students due by 8:30 a.m.
- All grades due by 4 p.m.
- Associate Degree Commencement (Subject to Change)
- Baccalaureate and Graduate Commencement

Summer Session 1985—First Term

June 1985

- Dormitories open at 1 p.m.
- Dining halls open at 4:30 p.m.
- Registration
- Classes begin—Schedule revisions—and/or late registration
- Last day for schedule revisions and/or late registration
- Fourth Class Day
- Last day to drop or withdraw without penalty
- Last day to apply for August graduation
- Last day to pay for diploma; cap and gown

July 1985

- Last day to drop or withdraw
- Independence Day—no classes
- Last class day
- All grades due by noon

Summer Session 1985—Second Term

July 1985

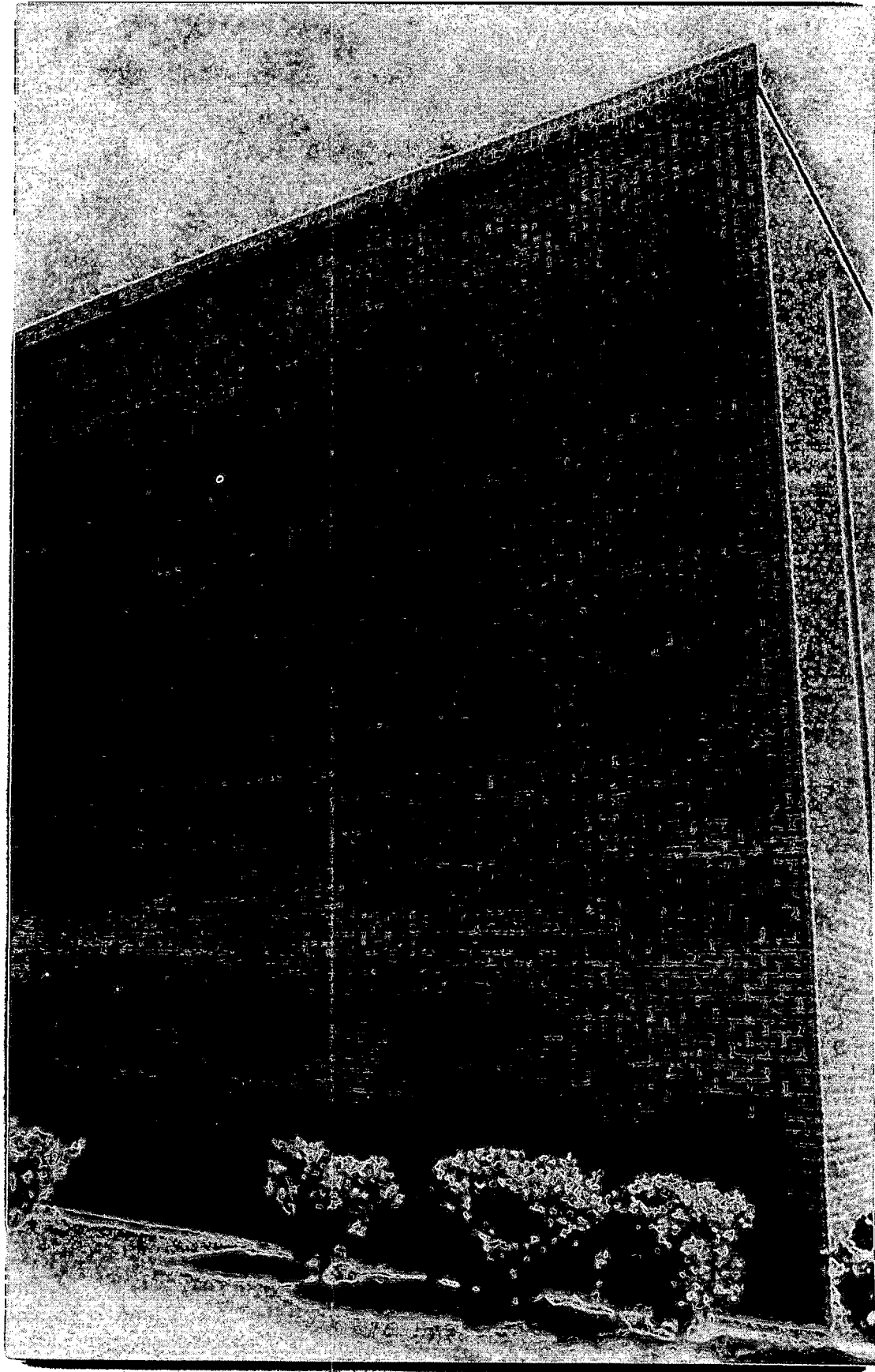
- Registration
- Classes begin—Schedule revisions and/or late registration
- Last day for schedule revisions and/or late registration
- Fourth Class Day
- Last day to drop or withdraw without penalty

August 1985

- Last day to drop or withdraw
- Last class day
- Grades for graduating students due by 8:30 a.m.
- Dining halls and dormitories close at 6 p.m.
- Associate Degree Commencement (Subject to Change)
- Baccalaureate and Graduate Degree Commencement
- All grades due by 8:30 a.m.

Table of Contents

General Information	9
Admissions	11
Financial Aid and Awards	12
Fees and Expenses	15
College of Technical Arts	20
Departments:	
Adult Training Programs	22
Industrial Department	33
Related Arts Department	42
Technical Department	49
Lamar University at Orange	55
Lamar University at Port Arthur	55
Academic Affairs	56
Graduation Requirements	56
Academic General Information	56
Student Affairs	63
Directory of Personnel	71
Index	76



General Information

Location

Lamar University, a state-supported institution, is located in Beaumont, one of the world's largest petrochemical centers. Beaumont is one of the fastest growing and most progressive cities in the Sunbelt. The city offers private and public schools, churches, museums, shopping districts and a wide range of leisure-time activities to serve the metropolis of 130,000. A civic center, convention center and coliseum draw professional entertainers and a wide variety of business, social and professional groups to the city. Beaumont is convenient to major recreational facilities of Southeast Texas, including the Gulf of Mexico, large lakes and the Big Thicket National Forest.

History

South Park Junior College was established in 1923 and was controlled by the South Park Independent School District. Classes were conducted in the South Park High School building. An initial enrollment of about 125 students in 1923 had increased to 300 by 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 instituted. By 1939, enrollment was approximately 640.

Lamar Union Junior College District was created in 1940, and Lamar College was separated from the South Park Independent School District. Bonds were approved 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, enrollment has increased to more than 12,800 students, and the curriculum has been expanded to include many areas of study. Graduate work in specified fields began in the academic year of 1960-61, and extension work became an integral part of the educational program in 1964. A doctoral program in engineering was added in 1971. Lamar University at Orange, offering first and second year courses, opened in 1969. Lamar University at Port Arthur, also offering first and second year courses, began operation in the fall of 1975, and expanded the occupational programs available to students. The University also owns 36 acres on Pleasure Island in Port Arthur.

The institution's status as a university became official on August 23, 1971, when the name was changed to Lamar University.

Vocational subjects were among the first courses offered by Lamar and have played an important role in the development of Lamar University. A Division of Vocations was established in 1946 and became the Lamar School of Vocations in 1955. In 1970, the name was changed to the School of Technical Arts and in 1972, it became the College of Technical Arts. During 1971, the College began awarding Associate of Applied Science degrees in certain two-year programs. The College offers the Certificate of Completion in programs of one year or less in duration.

Government

A board of nine regents, appointed by the Governor and approved by the State Senate for terms of six years, governs the University. The Board of Regents delegates the direction of university affairs to the president, administrative officers and faculty.

Accreditation

Lamar is accredited by the Association of Texas Colleges and Universities, the Southern Association of Colleges and Schools and is approved by the Texas Education Agency.

Several departments and programs have been accredited by professional agencies. In the College of Engineering, the departments of Chemical, Civil, Electrical, Industrial and Mechanical Engineering are accredited by the Accrediting Board for Engineering and Technology. The undergraduate programs of the College of Business are accredited by the Amer-

ican Assembly for Collegiate Schools of Business. Other accreditations include the Department of Chemistry by the American Chemical Society; Department of Music by the National Association of Schools of Music; and the Departments of Elementary and Secondary Education by the National Council for the Accreditation of Teacher Education, and Council on Social Work Education.

The University also is a member of a number of academic councils, societies, associations and other such organizations.

Objectives

The basic objective of the College of Technical Arts is to help students equip themselves for effective living and for responsible citizenship in our society by offering educational programs and training which will extend their basic knowledge, encourage their continued development and give them marketable skills. In working toward this goal, the College encourages students to assume a major share of the responsibility for the development of their potentialities and for utilization of their abilities, for their own purposes and for the good of society.

In order to stimulate students to have open minds, emphasis is placed upon the development of creative and scientific thinking for the solution of problems in the social and physical environment of their time. An effort is also made to provide guidance which will encourage the students to reach mature and responsible decisions, whatever the nature of the problems they may encounter.

The College of Technical Arts recognizes its obligation to make available to the community all the opportunities implicit in its function as a part of Lamar University. In an effort to achieve this goal, the specific objectives of the college are as follows:

1. To provide guidance services that will assist each student in making an appropriate vocational choice.
2. To provide certificate, diploma and degree programs designed to prepare students for employment in various fields.
3. To provide education and training which allows the graduate to advance rapidly in his/her chosen field.
4. To instill in the student the desire to learn which will guide his/her growth in his/her profession.
5. To provide in-service training to persons currently employed in Southeast Texas.

Admissions

High School Relations, Orientation and Recruitment

The Office of School Relations, located in Room 201 of the Wimberly Student Affairs Building, provides complete admissions counseling for entering students. Professionally trained personnel assist prospective students in assimilating all admission credentials so that the transition into a college environment can be made as smooth and problem-free as possible. The office also is responsible for coordinating special days, clinics and institutes on campus as well as arranging for student tours and college day/night visits. Orientation programs for entering freshmen, new international students and college transfers are coordinated here as well. All initial inquiries to the University should be made to this office by writing P.O. Box 10007, Lamar University Station, Beaumont, Texas 77710-409/838-7516.

Admissions Requirements

Students who desire to enter programs in the College of Technical Arts must satisfy the following admission requirements:

1. File an application for admission.
2. Have transcript of high school grades sent directly to the Dean of Admissions and Records, Lamar University. Students transferring from another institution must submit official transcripts from each college previously attended. This requirement applies regardless of the length of time in attendance and regardless of whether credit was earned or is desired. Further information concerning transfer students may be found in the "Admissions" section of the general university bulletin.
3. One of these prerequisites must be met:
 - a. Graduation from an accredited high school, or
 - b. Transfer with transcript from an accredited college or university, or
 - c. Individual approval from the Dean of Admissions and Records. Persons 19 years of age or older whose high school class has been graduated for at least one year who demonstrate the ability to benefit from college coursework may request consideration for individual approval. Students wishing to enter under this prerequisite should first contact the Dean of the College of Technical Arts for admission to the Beaumont campus; the director of the Orange campus or the director of the Port Arthur campus.

Entrance Examination

Students entering the College of Technical Arts are not presently required to take an entrance examination. However, they are encouraged to take either the SAT or ACT while attending high school. These examinations are useful for counseling purposes. Both tests are given several times each year at test centers throughout the United States and in many foreign countries. It is recommended that summer and fall applicants take one of these tests early in the senior year and, if possible, no later than February. Location of test centers, test dates, fees, test application forms, sample question booklets, etc. may be obtained without charge from high school school counselors or by writing to the testing agency. SAT inquiries should be directed to the College Entrance Examination Board, Box 1025, Berkeley, California 94704. ACT inquiries should be directed to the American College Testing Program, Box 168, Iowa City, Iowa 52240.

Where to Apply

All required admission forms should be addressed to the Office of Admissions and Records, Lamar University, Lamar University Station, Box 10009, Beaumont, Texas 77710.

Readmission

Former Lamar students who have not been in attendance for one or more regular semesters must file for readmission by submitting the standard application for admission form.

Financial Aid and Awards

Financial assistance in the form of scholarships, grants, loans and employment is available to a number of qualified students. Information regarding programs and eligibility criteria can be obtained from the Office of Student Aid, P.O. Box 10042, Lamar Station, Beaumont, Texas 77710.

When To Apply

Applications should be completed by March 1 for the following academic year. Notification of awards will be mailed in late spring and early summer. The university will continue to award student aid as long as funds are available. The most desirable types of aid, however, are normally expended early. Therefore, students should make every effort to meet the March 1 deadline.

How To Apply

Lamar University requires all students applying for aid to file the General Application for Student Aid. Students wishing to be considered for scholarships only should request the Scholarship Application. Students should be aware that scholarship funds are limited and recipients normally must have a grade point average in excess of 3.50 to be considered.

Students wishing to apply for grants, loans and/or work-study employment must also file the Financial Aid Form with the College Scholarship Service to determine the degree of need. Since the processing of this form requires between three and four weeks those students planning to meet the March 1 deadline should file about February 1.

After the application is complete the Student Aid Office will consider the student's academic record and potential as well as substantiated degree of need. The amount and type of assistance will be determined by the staff of the Student Aid Office.

Minimum Qualifications

Scholarship awards to entering freshmen are determined by the applicant's scores on the Scholastic Aptitude Test (SAT) or American College Testing Program (ACT), leadership and high school class rank. Scholarship awards for upperclassmen are determined by their cumulative grade point average at the college level. Scholarship applicants must have a combined score of 900 on the SAT or composite score of 20 on the ACT plus a grade point average in excess of 2.5 to be eligible for a university administered scholarship.

Those applying for need-based grants, loans or work-study employment have their eligibility established by the Financial Aid Form.

Applicants should arrange to have SAT or ACT test scores on file with Lamar University Admissions Office and have the General Application and Financial Aid Form calculation on file in the Student Aid Office. Freshmen may be able to obtain required forms from their high school counselors or directly from the Student Aid Office, P.O. Box 10042, Beaumont, Texas 77710. Students currently enrolled at Lamar may obtain the forms from the Student Aid Office, Wimberly Student Affairs, Room 216. Students must re-apply each year for consideration for continued assistance.

Grants

The Basic Educational Opportunity Grant (PELL) is the foundation source for all other aid programs. All applicants are required to submit the Student Eligibility Report for the Basic Grant except those applying for scholarships only. No other need based assistance (grants, loans, work-study) can be awarded until the student's eligibility for the Basic Educational Opportunity Grant is determined. The filing of the Financial Aid Form should cause the BEOG Student Eligibility Report to be sent to the student's address. The student should then send the Student Eligibility Report to the Student Aid Office for an estimated grant amount to be determined. The final Basic Grant will be determined at the time of enrollment.

Other available grants are the Supplemental Educational Opportunity Grant, the Texas Public Education Grant (TPEG) and the State Student Incentive Grant (SSIG). Students with

exceptional need as determined by the Financial Aid Form may be awarded one of these grants.

Scholarships

Scholarships are funds which cover a portion of the student's expenses. Scholarships at Lamar University are of two types: those administered solely by the university, including the selection of recipients, and those administered by the university at the request of donors who select the recipients themselves. The scholarship program at Lamar University is financed solely by public donation. Half of the scholarship is disbursed for the fall term and the remaining half for the spring semester.

Loans

Lamar University provides both short-term and long-term loans. Short-term loans for 30 days are designed to cover emergency situations and must be repaid within the semester in which the loan is made. Long-term loans with repayment after graduation may be obtained under such programs as the National Direct Student Loan Program, the Federally Insured Student Loan Program, and the Hinson-Hazelwood College Student Loan Act. Those interested in one of these loan programs should contact the Student Aid Office for information and application forms.

Employment

Employment opportunities under the College Work Study Program and other employment programs of the University are available to Lamar students as part of the financial assistance program. The University, local businesses and industries provide a number of part-time jobs which enable students to earn part or all of their expenses while attending the University.

Valedictorians

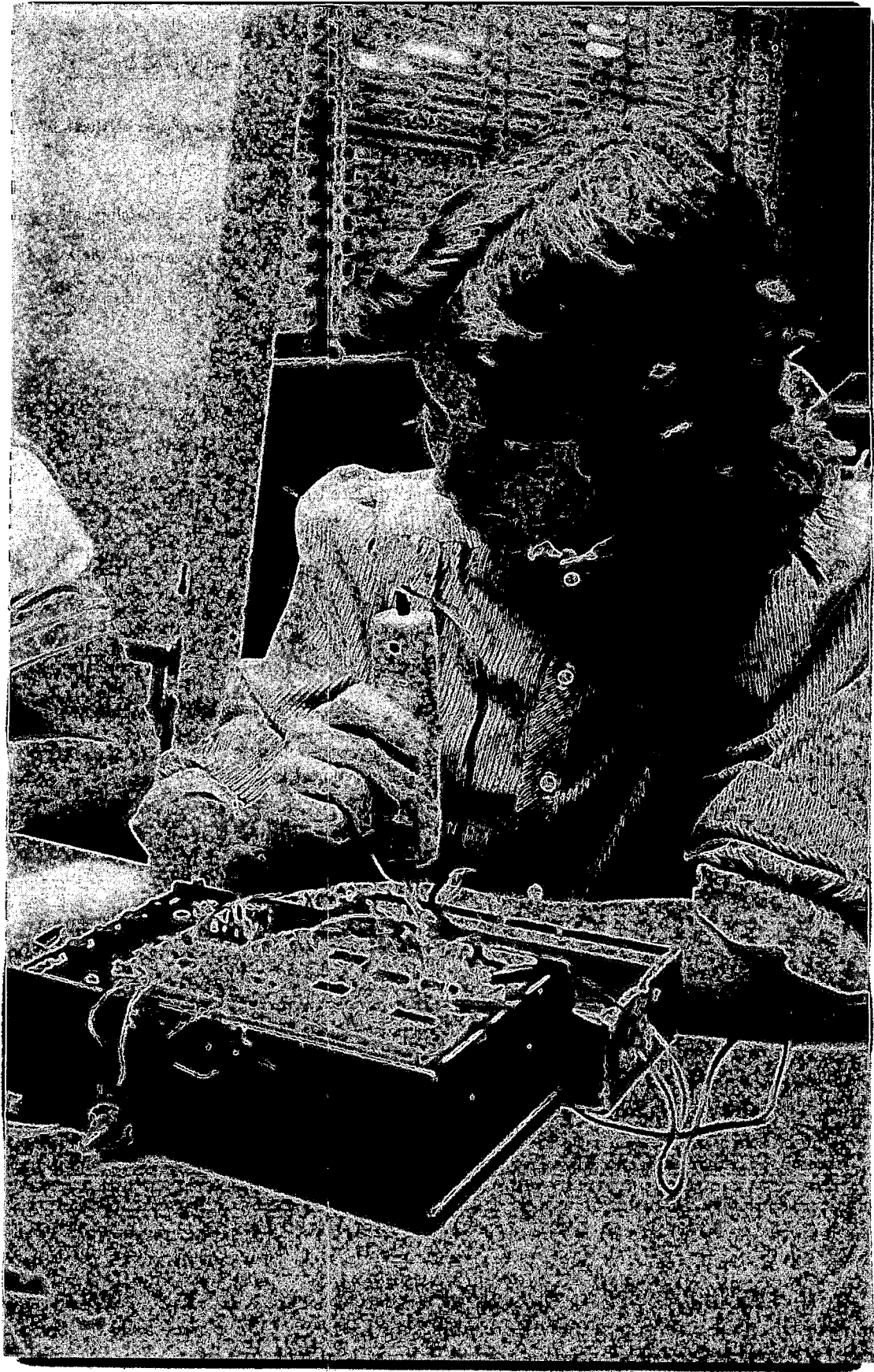
Valedictorians from accredited high schools of Texas are entitled to an exemption from payment of tuition for the two regular semesters immediately following graduation. Fees are not exempt. During registration, valedictorians should report to the scholarship station for fee adjustments. The names of valedictorians of all Texas high schools are certified by principals to the Texas Education Agency and the list is supplied to the University for reference.

Students with Physical Handicaps (Vocational Rehabilitation)

The Texas Rehabilitation Commission offers assistance for tuition and nonrefundable fees to students who have certain disabling conditions, provided their vocational objectives have been approved by a TRC counselor. Examples of such conditions are orthopedic deformities, emotional disorders, diabetes, epilepsy, heart conditions, etc. Other services also are available to assist the handicapped student to become employable. Application for such service should be made at the Texas Rehabilitation Commission, Beaumont District Office, 1110 Goodhue Building, Beaumont, Texas 77701.

Services for Handicapped Students

Services for handicapped students are designed to help the student be as successful as possible on the Lamar campus. Students who have certain disabilities qualify for registration assistance, tutoring, adaptive equipment and other personalized services. For additional information contact the Coordinator of Handicapped Services in the Wimberly Student Services room 101A, phone 838-8026.



Fees and Expenses

Lamar University reserves the right to change fees in keeping with acts of the Texas Legislature and the University's Board of Regents.

Payment of Fees

A student is not registered until all 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 University and will be accepted subject to final payment. Checks and drafts deposited with Federal Reserve banks cannot be handled through regular bank collection channels if received without the magnetic ink (MICR transit number).

Summary of Registration Expenses

Each student must plan a budget carefully. It is possible to attend Lamar on a modest sum and yet participate in most phases of the university program. To assist in planning registration expenses, the following estimate is furnished as a guide.

Texas residents taking a 15 hour academic work load*:

Tuition.....	\$60
Student Services Fee.....	60
General Use Fee.....	90
Setzer Student Center Fee.....	20
Student Health Fee.....	15
Parking Fee (if desired).....	15
Health Insurance (if desired).....	45
Books (estimated).....	160
	\$465
	+ lab fees

Part-time Student (Six semester hours):	
Tuition.....	\$50
Student Services Fee.....	30
General Use Fee.....	36
Setzer Student Center Fee.....	20
Student Health Fee.....	6
Parking Fee (if desired).....	15
Health Insurance (if desired).....	45
Books and Incidentals (estimated).....	80

Tuition and general use fees vary with the semester hours carried so the total may differ from this estimate.

*Tuition for Texas residents taking 12 hours or less is \$50 per semester. Each additional semester hour is \$4 per hour. A full-time student is one who takes 12 or more semester hours of course work.

Summary of Fees

Additional fees and charges which are applied on a selective basis are listed following the Summary of Fees.

Term	No. of Semester Hours	Tuition		Student Services Fee	General Use Fee	Setzer Center Fee	Health Fee	Total Charge Center	
		A	B					A	B
Each	1	\$50	\$ 40	\$ 20	\$ 20	\$20	\$ 5	\$115	\$105
Fall	2	50	80	25	20	20	5	120	150
or	3	50	120	30	20	20	5	125	195
Spring	4	50	350	16	24	20	5	134	244
Semester	5	50	400	20	30	20	5	145	295
	6	50	240	45	36	20	6	157	347
	7	50	280	50	42	20	7	169	399
	8	50	320	55	48	20	8	181	451
	9	50	360	60	54	20	9	193	503
	10	50	400	60	60	20	10	200	550
	11	50	440	60	66	20	11	207	597
	12	50	480	60	72	20	12	214	644
	13	52	520	60	78	20	13	223	691
	14	56	560	60	84	20	14	234	738
	15	60	600	60	90	20	15	245	785
	16	64	640	60	90	20	15	249	825
	17	68	680	60	90	20	15	253	865
	18	72	720	60	90	20	15	257	945
	19	76	760	60	90	20	15	261	945
	20	80	800	60	90	20	15	265	985
Each	1	\$25	\$ 40	\$ 9	\$20	\$10	\$ 1	\$ 76	\$ 91
Six	2	25	80	25	20	10	2	82	137
Week	3	25	120	30	20	10	3	88	183
Summer	4	25	160	30	24	10	4	93	220
Session	5	25	200	30	30	10	5	100	275
	6	25	240	30	36	10	6	107	322
	7	28	280	30	42	10	7	117	369
	8	32	320	30	48	10	8	128	416
	9	36	360	30	54	10	9	139	463
	10	40	400	30	60	10	10	150	510

Code: A. U.S. citizens who are legal residents of Texas under tuition law; B: (1) U.S. citizens who are not legal residents of Texas under tuition law, and (2) aliens from non-exempt countries.

Tuition and Fees

Tuition is based upon the number of hours for which the student registers, and is determined by the student's classification as a Texas resident; a nonresident U.S. citizen; or a citizen of another country. Determination of legal residence for tuition purposes is made on the basis of statutes of the State of Texas.

Laboratory Fees

A laboratory fee of \$2 is charged each semester for courses with a combined lecture and laboratory credit of from one to three semester hours. The laboratory fee is \$4 per semester for courses of four or more semester hours credit.

Private Lessons in Voice and Instrumental Music

One half-hour lesson per week \$18
Two half-hour lessons per week 36

Late Registration Fee

A charge of \$5 is made during the first day of late registration, \$10 for the second day and \$15 for the third and following days.

Parking Fee

Charges for parking on campus are made at registration. Automobile registration fees are as follows: Fall Semester, \$15; Spring Semester, \$10; Summer Session I, \$6; Summer Session II, \$4. Only one registration is required during an academic year, and a student's parking fee is honored until the end of Summer Session II.

Health and Accident Insurance

Health and accident insurance coverage is available at registration for regularly enrolled students. The fee is estimated at \$45 per long semester. This or similar insurance is required of all international students. Additional information may be obtained from the Dean of Students' office, Room 109, Wimberly Student Services Building.

Special Fees

Fees will be set by the University for courses in which special plans must be prepared and specialists secured as instructors.

Exemption 1: Scholarships to High School Honor Graduates

The highest ranking student in the graduating class of a fully accredited Texas high school will be entitled to a tuition and laboratory fee waiver valued at approximately \$100. Details may be obtained from the Student Aid Office.

Exemption 2: Veterans (Hazelwood)

Persons who were citizens of Texas at the time of entry into the Armed Forces, and who are no longer eligible for federal educational benefits, are exempt from tuition, laboratory fees, Setzer Student Center fees, and general use fee. This applies to those who served in World War I, World War II, the Korean Conflict or the Vietnam War and were honorable discharged. This exemption also applies to those veterans who entered service after Jan. 1, 1977, and did not contribute under the VEAP program. To obtain this exemption, necessary papers must be presented prior to registration and approval obtained from the Office of Veterans' Affairs. The above exemption also extends to wives, children and dependents of members of the Armed Forces who were killed in action or died while in the service in World War II, the Korean Conflict or Vietnam War.

Students who have been out of the service more than ten years need to provide a copy of their separation papers (DD214). Students separated for a period of less than ten years must also provide a letter from the Veterans Administration stating that the student has no remaining eligibility.

Students who expect to attend under some veterans' benefit plan should contact the Office of Veterans' Affairs 60 to 90 days prior to registration. The Office of Veterans' Affairs advises veterans on program and training opportunities, academic assistance and counseling. Veterans interested in information in these areas should visit this office in the Wimberly Student Services Building.

Policy on Waiving Fees

Off Campus Classes

Students taking classes which are held off campus will not be required to pay Setzer Center or Health fees. The tuition, student service fee, and general use (building) fee are required by either Board of Regents or State statute and cannot be waived. Students who may have classes both on campus and off campus will have health fee based on the number of hours on main campus.

Example of the above where fees are waived are:

- (a) Field Center Courses
- (b) Summer trips for credit
- (c) Vocational Nursing courses which conduct all their classes at the hospital.

(d) COOP students, for semester when they are not taking classes on campus. (Only pay tuition because Board of Regents have waived student service and general use fee.)

Example Where fees are not waived:

(a) Student enrolled only for thesis course (Pays only \$25 for tuition.) plus all other normal fees.

(b) Student enrolled only for a special project course.

Faculty and Staff with Activity Cards

Faculty and staff with Activity Cards will have the student service fee waived to avoid paying twice for same service.

Refund of Fees-Withdraw Refunds

Any student officially withdrawing during the first part of the semester will receive a refund on tuition, Setzer Center, student service, laboratory, building and general use and private lesson fees according to the following schedule:

Fall or Spring Semester

1. Prior to the first class day, 100 per cent.
2. During the first five class days, 80 per cent.
3. During the second week of the semester, 70 per cent.
4. During the third week of the semester, 50 per cent.
5. During the fourth week of the semester, 25 per cent.
6. After the fourth week of the semester, none.

Summer Session

1. Prior to the first class day, 100 per cent.
2. During the first, second or third class day, 80 per cent.
3. During the fourth, fifth or sixth class day, 50 per cent.
4. Seventh class day and after, none.

Drop Course Refunds

All students who drop courses during the first 12 class days of the Fall or Spring Semester, or within the first four days of a Summer Session, and remain enrolled at Lamar University, will receive a refund on tuition and fees for that particular course or courses. All questions regarding refunds should be directed to the Finance Office.

Returned Check Fees

A student is automatically suspended from the University if a check is returned unpaid. The student may re-enter upon redemption of the check plus payment of the returned check fee of \$10.

Miscellaneous Fees

Associate Diploma	\$12.00
Certificate of Completion	12.00
Bachelor's Diploma	12.00
Master's Diploma	12.00
Ph.D.'s Diploma	12.00
Bachelor's Cap and Gown (disposable)	15.50
Master's Cap, Gown and Hood Rental	25.50
Ph.D.'s Cap, Gown and Hood Rental	27.50
Returned Checks (Bookstore)	10.00
Re-entry fee	5.00
Transcript Fee	2.00
Advanced Standing Examination (per course)	25.00
Photo Identification	2.00
Lost Photo I.D.	5.00
Swimming Pools (suits and towels) Per Semester	15.00
Copy of Fee Receipt50

Fine and Breakage Loss

Library fines, charges for breakage or loss of equipment or other charges must be paid before a transcript of credit or a permit to re-enter the University will be issued.

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

Rules and Regulations for Determining Residence Status

See the general bulletin for complete information on how residence status is determined, or consult the Coordinating Board, Texas College and University System "Rules and Regulations for Determining Residence Status" as revised, October 17, 1975. The latter publication is available at the Admissions and Records Office.

Technical Degree Programs

The following list of technical degree programs is for informational purposes only. The actual program and fee schedule are available in the Admissions and Records Office.

- Agricultural Engineering
- Chemical Engineering
- Electrical Engineering
- Industrial Engineering
- Manufacturing Engineering
- Metallurgical Engineering
- Robotics Engineering
- Software Engineering
- Systems Engineering
- Transportation Engineering
- Urban Planning
- Architecture
- Interior Design
- Professional Education
- Education Administration
- Education Leadership
- Education Policy
- Education Research
- Education Technology
- Education Evaluation
- Education Leadership
- Education Policy
- Education Research
- Education Technology
- Education Evaluation

All of the above degree programs are designed to provide students with the skills and knowledge necessary to enter the workforce upon graduation.

The University of Texas System is committed to providing high-quality education and research. The technical degree programs are an integral part of this commitment.

College of Technical Arts

The College of Technical Arts provides technical and industrial education for thousands of men and women from Texas, other states and many foreign countries. It is housed in a modern plant consisting of six buildings containing 125,000 feet of classroom, shop and office space. The new Cecil R. Beeson Technical Arts classroom and office building was completed for occupancy for the fall of 1977. Parking for 550 cars is provided adjacent to these buildings. Entrance to this area, located in the 4400 block of Spur 380 Beaumont-Port Arthur Highway, is on Lavaca Street. Off-campus courses are offered in several cities in the area.

An Associate of Applied Science degree is awarded in the following fields of study: business data processing; child care technology; computer electronics and robotics technology; drafting technology; diesel mechanics; electrical technology; electronics technology; fire protection technology; industrial electronics technology; industrial supervision; instrumentation technology; machine tools; mid-management; occupational safety and health; property tax administration; real estate; refrigeration and air conditioning technology; and welding.

The appliance repair, child care technology, industrial supervision, instrumentation technology, occupational safety and health, plant maintenance, plate welding, real estate, and refrigeration programs have provisions for offering a Certificate of Completion when the specified course requirements have been satisfied.

Associate Degree Programs

The College of Technical Arts offers career-oriented education in 17 degree programs in four departments in the College. The 17 programs that lead to the Associate of Applied Science degree are:

Adult Training Programs

- Child Care Technology
- Electrical Technology
- Fire Protection Technology
- Instrumentation Technology
- Occupational Safety and Health

Industrial Department

- Diesel Mechanics
- Machine Tools
- Refrigeration and Air Conditioning Technology
- Welding

Related Arts Department

- Business Data Processing
- Industrial Supervision
- Mid-Management
- Property Tax Administration
- Real Estate
- Industrial Electronics Technology

Technical Department

- Computer Electronics and Robotics Technology
- Drafting Technology
- Industrial Electronics Technology

All of the above two-year programs are designed to give the student training prior to entry into an occupation. Successful completion of one of these programs should provide the student with sufficient knowledge, skill and confidence to enter and advance rapidly in a selected field.

The curriculum of each program is designed to allow a student to enter in any semester and is arranged so that a student can take supporting work in either the College of Technical Arts or in other colleges in the University.

Certificate Programs

In addition to the above degree and diploma programs, the College of Technical Arts offers Certificates of Completion in ten programs.

Adult Training Programs

Child Care Technology

Fire Protection Certification School

Instrumentation Technology

Occupational Safety and Health

Plant Maintenance and Operations

Industrial Department

Appliance Repair

Refrigeration

Plate Welding

Related Arts Department

Industrial Supervision

Real Estate

Bachelor of Science in Industrial Technology

The Department of Industrial Engineering in the College of Engineering is offering the Bachelor of Science degree in Industrial Technology. Most of a student's Technical Arts work will apply to this four year degree. Students should refer to the general bulletin for a description of this non-engineering degree.

New Programs in High Technology

Because this publication covers an extended time period, new programs may be created and described in an official supplement to this bulletin. Prospective students are encouraged to contact the College of Technical Arts to determine the status of several new programs being considered.

Other Associate Degrees

Two year program leading to associate degrees and certificates are offered by the other colleges within Lamar University. At the Beaumont campus, the following programs are offered:

Office Administration—College of Business

Food Service Management—College of Education

Law Enforcement—College of Arts and Sciences

Teacher Aide—College of Education

Dental Hygiene—College of Health and Behavioral Science

Radiologic Technology—College of Health and Behavioral Science

Associate Degree Nursing—College of Health and Behavioral Science

Vocational Nursing—College of Health and Behavioral Science

Respiratory Technology—College of Health and Behavioral Science

Adult Training Programs

Supervisor: Norman E. Lowrey

218 Beeson Technical Arts Building

Child Care Technology

This course of study is provided for persons preparing for, or employed in, the field of early childhood care. The courses may be used as academic instruction in working toward national Child Development Associate requirements, but do not provide Child Development Associate certification by themselves. An Associate of Applied Science degree will be awarded upon completion of the program.

Recommended Program of Study

First Semester	Second Semester
*CCT 131 Survey of Early Childhood Development 3:3:0	*CCT 136 The Infant 0 to 18 Months 3:3:0
*CCT 132 Nutrition and Health 3:3:0	*CCT 161 Child Care Practicum 6:3:10
HEc 137 Marriage & Family Relationships 3:3:0	MM 231 Small Business Management 3:3:0
BC 131 Basic Communications or Eng 131 3:3:0	TM 134 Business Mathematics 3:3:0
TM 131 Fundamentals of Math For Mth 1313 3:3:0	Humanities elective 3:3:0
15:15:10	18:15:10
Third Semester	Fourth Semester
*CCT 231 Advancing Language Use 3:1:4	*CCT 241 Developing and Advancing Creativity 4:2:4
*CCT 232 Toddlers 18 to 36 Months 3:3:0	CCT 237 Development and Administration of Child Care Centers 3:3:0
CCT 235 Working with the Exceptional Child 3:3:0	CCT 262 Curriculum Planning and Teaching Techniques 6:3:10
*CCT 261 Special Problems Seminar and Practicum 6:3:10	.. Elective 5:5:0
Gov.231 Introduction to American Government 3:3:0	
18:11:18	18:13:14

**A certificate of completion will be awarded upon satisfactory completion of these courses.

**At least 2 semester hours to be chosen from Art 139 Art Appreciation WPE 123 Basic Movement Fundamentals Psy 131 Introduction to psychology Soc 131 Introduction to Sociology JR 232 Human Relations.

Child Care Technology Courses (CCT)

- 131 **Survey of Early Childhood Development** 3:3:0
This course includes an overview of the basic development in children-zero to six years of age with emphasis placed on working with children in all areas on their developmental level.
- 132 **Nutrition and Health** 3:3:0
This course will cover instruction in basic health, and safety, including an overview of common childhood illnesses and recognition of them.
- 136 **The Infant 0 to 18 Months** 3:3:0
This course will provide an in-depth study of the infant from conception to 18 months. All phases of infant development will be included. Appropriate ways of working with infants in a day care center situation will be discussed.
- 161 **Child Care Practicum** 6:3:10
This course will focus on guidance techniques and observation skills to be used with young children. Students will also be certified in first aid and CPR. This course is a prerequisite to all other lab courses.
Prerequisite: CCT 131 and CCT 132.
- 231 **Advancing Language Use** 3:1:4
This course is designed to teach methods of increasing language use in children. These techniques include role-playing, puppetry, dramatization, etc. This course also includes an insight into the vast world of literature available for young children at different age levels and instructions on how teachers may effectively present stories to them.
- 232 **Toddlers 18 to 36 Months** 3:3:0
This course provides an in-depth study of the toddler's development in all areas. Means of working with a toddler in a day care center will be discussed.

- 235 **Working with the Exceptional Child** 3:3:0
This course is designed to help the student deal with exceptional children in a day care situation. Simple testing procedures for determination of a child's developmental levels will be presented. The course will include discussions of ways to work with children who do not have "normal" development.
- 237 **Development and Administration of Child Care Centers** 3:3:0
This course includes an overview of the types of centers, equipment needs, licensing requirements, choosing and working with staff and current issues concerning day care center operation.
- 241 **Developing and Advancing Creativity** 4:2:4
This course demonstrates how creativity is used in arts and crafts in the young child as well as how it influences other areas of the early childhood curriculum.
- 261 **Special Problems Seminar and Practicum** 6:3:10
This course will include discussions concerning situations arising in the operation of day care centers and how to deal with them, offering practical experience through actual participation in a day care center.
- 262 **Curriculum Planning and Teaching Techniques** 6:3:10
This course deals with planning curricula for pre-school age children and a survey of learning methods and theories with practical application of these theories in the child care facility.

Electrical Technology

Graduates of the program will be prepared to function in electrical maintenance and electrical distribution related occupations. The program is designed to interface with approved training programs.

Upon completion of the Program of Study an Associate of Applied Science Degree will be awarded.

Recommended Program of Study

First Semester	Second Semester
ELE 130 Electrical Blueprint Reading I..... 3:2:2	ELE 133 Electrical Blueprint Reading II..... 3:2:2
ELE 131 Fundamentals of Electricity..... 3:3:0	ELE 134 Three Phase AC Theory I..... 3:3:0
ELE 132 DC and Single Phase AC Theory..... 3:3:0	ELE 135 Three Phase AC Theory II..... 3:3:0
ELE 136 Basic Electrical Lab or..... 3:0:6	ELE 138 Three Phase AC Lab I or..... 3:0:6
ELE 137 DC and Single Phase AC Lab or..... 3:0:6	ELE 142 Electrical Internship*..... (4:0:20)
ELE 121 Seminar*..... (2:2:0)	ELE 139 Three Phase AC Lab II or..... 3:0:6
ELE 141 Electrical Internship*..... (4:0:20)	ELE 122 Seminar*..... (2:2:0)
TM 1331 Algebra-Trigonometry..... 3:3:0	BC 131 Basic Communications..... 3:3:0
18:11:14	18:11:14
Third Semester	Fourth Semester
ELE 230 Electrical Codes and Standards I..... 3:3:0	ELE 233 Electrical Codes and Standards II..... 3:3:0
ELE 231 Electrical Power Distribution..... 3:3:0	ELE 234 AC-DC Motor Control..... 3:3:0
ELE 232 AC-DC Machines..... 3:3:0	ELE 238 AC-DC Motor Control Lab or..... 3:0:6
ELE 236 Power Distribution Lab or..... 3:0:6	ELE 242 Electrical Internship*..... (4:0:20)
ELE 241 Electrical Internship*..... (4:0:20)	ELE Electives..... 6:3:6
ELE 237 AC-DC Machines Lab or..... 3:0:6	Elective or ELE 222 Seminar*..... (3:3:0)
ELE 221 Seminar*..... (2:2:0)	Elective..... (2:2:0)
BC 231 Technical Report Writing..... 3:3:0	Elective..... 3:3:0
18:12:12	18:12:12
Electives	
ELE 235 Electrical Power Generation..... 3:3:0	
ELE 239 Protective Relaying..... 3:0:6	
ELE 2310 Trouble Shooting Techniques..... 3:3:0	
ELE 2311 Industrial Installations..... 3:0:6	

*These courses are designed for students in approved training or apprentice programs.

Electrical Technology Courses (ELE)

- ELE 121, 122, 221, 222 Seminar** (2:2:0)
This course is designed to address specific topics of interest to students enrolled in ELE 141, 142, 241, or 242 Electrical Internship.
Corequisite: ELE 141, 142, 241 or 242.
- ELE 130 Electrical Blueprint Reading I** (3:2:2)
This course includes a study of the provisions of the National Electrical Code and its application to electrical installations. Block diagrams and schematics of industrial controls also will be studied.

- ELE 131 Fundamentals of Electricity** (3:3:0)
This course is designed to give the student an introduction to electrical theory. Electron theory, ohm's law, and theory of magnetism will be discussed.
Corequisite: TM 1331.
- ELE 132 DC and Single Phase AC Theory** (3:3:0)
A study of more complex DC and single phase AC circuits, reactance, impedance, power factor and phase relationship will be discussed.
- ELE 133 Electrical Blueprint Reading II** (3:2:2)
A continuation of ELE 130 with emphasis on the mathematics involved in code applications.
- ELE 134 Three Phase AC Theory I** (3:3:0)
A study of the generation, distribution, transformation and utilization of three phase current.
- ELE 135 Three Phase AC Theory II** (3:3:0)
A continuation of ELE 134 with emphasis on power factor correction and introduction to motor loads.
- ELE 136 Basic Electrical Lab** (3:3:0)
This lab course will provide experiments with basic electrical circuits to demonstrate electrical and magnetic principles, basic wiring techniques and skills will also be taught in this lab.
Corequisite: TM 1331
- ELE 137 DC and Single Phase AC Lab** (3:0:6)
Advanced wiring procedures and skills, including residential and commercial installations will be taught in this course.
- ELE 138 Three Phase AC Lab I** (3:0:6)
Experiments with the transformation and utilization of three phase AC in inductive and capacitive loads will be conducted in this lab.
- ELE 139 Three Phase AC Lab II** (3:0:6)
A continuation of ELE 138 with emphasis of phase correction for inductive and capacitive loads.
- ELE 141, 142, 241, 242 Electrical Internship** (4:0:20)
Approved supervised employment under supervision of journeyman or first class craftsman to be certified by program coordinator.
Corequisite: ELE 121, 122, 221, or 222.
- ELE 230 Electrical Codes and Standards I** (3:3:0)
A study of the provisions and interpretations of the National Electrical Code and its relationship to other standards including the OSHA Act.
- ELE 231 Electrical Power Distribution** (3:3:0)
A detailed study of transformers, relays, utility lines and installation practices.
- ELE 232 AC-DC Machines** (3:3:0)
A study of the various types of AC-DC motors and their characteristics.
- ELE 233 Electrical Codes and Standards II** (3:3:0)
A continuation of ELE 230.
- ELE 234 AC-DC Motor Control** (3:3:0)
A study of motor starting, speed control and stopping systems and devices will be studied in this course.
- ELE 235 Electrical Power Generation** (3:3:0)
Study of the operation and maintenance of electrical generation equipment and drive mechanisms utilized in industrial and public utility applications.
- ELE 236 Power Distribution Lab** (3:0:6)
Extensive experiments with transformers, relays and other devices used in the electrical distribution system will be conducted in this lab.
- ELE 237 AC-DC Machines Lab** (3:0:6)
Practical experiments with electrical machines, controls and accessories will be conducted in this laboratory course.
- ELE 238 AC-DC Motor Control Lab** (3:0:6)
A continuation of ELE 232 with emphasis on starting, speed control and stopping systems and devices.
- ELE 239 Protective Relaying** (3:0:6)
Experiments with relays used in switching of high voltage and balancing of generation equipment.
- ELE 2310 Trouble Shooting Techniques** (3:3:0)
Techniques and equipment used in diagnosing and remediating electrical malfunctions will be studied in this course.

ELE 2311 Industrial Installations (3:0:6)
 Skills in the installation of rigid, explosion proof electrical system will be taught in this course.

Instrumentation Technology

This program of study will prepare students to diagnose problems in complex loops utilized in automated manufacturing systems. The graduate will be proficient in the repair and maintenance of individual control devices, both pneumatic and electronic.

An Associate of Applied Science Degree will be awarded upon completion of the two-year Program of study.

Recommended Program of Study

First Semester	Second Semester
ELE 131 Fundamentals of Electricity, or IET 131 DC Theory and Circuits..... 3:3:0	IT 131 Pneumatic Instruments I..... 3:3:0
ELE 136 Basic Electrical Lab or IET 136 DC Lab..... 3:0:6	IT 132 Pneumatic Instruments II..... 3:3:0
PM 1418 Related Physics..... 4:3:2	IT 136 Pneumatic Instruments Lab I..... 3:0:6
PM 1340 Industrial Hydraulics..... 3:3:0	IT 137 Pneumatic Instruments Lab II..... 3:0:6
OSH 131 Introduction to Occupational Safety and Health..... 3:3:0	BC 131 Basic Communications..... 3:3:0
TM 1331 Algebra - Trigonometry..... 3:3:0	JR 231 Job Relations..... 3:3:0
19:15:8	18:12:12

Third Semester	Fourth Semester
IT 232 Electronic Instruments..... 3:3:0	IT 234 Control System..... 3:3:0
IT 232 Analyzer Theory and Application..... 3:3:0	IT 235 Introduction to Robotics..... 3:3:0
IT 236 Electronic Instrument Lab..... 3:0:6	IT 238 Control Systems Lab..... 3:0:6
IT 237 Analyzer Lab..... 3:0:6	IT 239 Electro-Mechanical System Lab..... 3:0:6
PIP 232 Instrument Piping System..... 3:3:0	BC 231 Technical Report Writing..... 3:3:0
PM 1320 Unit Operations..... 3:3:0	IS 1317 Applied Supervision..... 3:3:0
18:12:12	18:12:12

Instrumentation Technology Courses (IT)

- IT 131 Pneumatic Instruments I** 3:3:0
 A study of the physical and chemical laws affecting pressure and temperature measuring and recording instruments. The operation and application of instruments for controlling processes is covered.
- IT 132 Pneumatic Instruments II** 3:3:0
 A continuation of Pneumatic Instruments I with emphasis on loop configuration and interfacing.
- IT 136 Pneumatic Instruments Lab I** 3:0:6
 A study of the various instruments used in the control of industrial processes. Demonstration and application of calibration procedures will be the major emphasis of this lab course.
- IT 137 Pneumatic Instruments Lab II** 3:0:6
 Experimentation with changing parameters for loop operation and troubleshooting techniques.
- IT 231 Electronic Instruments** 3:3:0
 A study of electrical generating, inducing and activating devices.
- IT 232 Analyzer Theory and Application** 3:3:0
 A study of various analyzers utilized in process and environmental analysis.
- IT 233 Automated Manufacturing Processes** 3:3:0
 Application of robots, instrumentation and electro-mechanical systems in metal machining and forming, assembling and other manufacturing tasks.
- IT 234 Control System** 3:3:0
 The basic control theory and methods for obtaining various control effects are studied. Practical industrial installations of control systems, controller adjustments and checking and testing procedures are stressed.
- IT 235 Introduction to Robotics** 3:3:0
 Introduction to Robotics relative to instrumentation. A study of pneumatic, hydraulic and electrical power supplies and controls used by Industrial robots.
- IT 236 Electronic Instrument Lab** 3:0:6
 A lab course to prepare the student to align, repair and diagnose problems incurred with electronic/electro-mechanical controllers, recorders and transmitters.
- IT 237 Analyzer Lab** 3:0:6
 A laboratory course in operation and maintenance of various analytical devices including O₂, CO₂, H₂S, and boiler stack gas analysis.

- IT 238 Control Systems Lab 3:0:6
A study of the interface between various instruments. Techniques of isolation of defective components in instrumentation loops will be explored.
- IT 239 Electro-Mechanical Systems Lab 3:0:6
A study of switches, relays, mechanical counters and mechanical motor controls.

Fire Protection Technology

The objectives of this program are to provide training for supervisory personnel for fire departments and industrial safety departments, provide inservice education for fire fighters and prepare graduates for related careers, such as fire insurance sales personnel. The fire protection technology courses are generally taught during the extended day hours and the schedule of classes allows attendance by students working shifts.

A graduate of this two-year instructional program is awarded the Associate of Applied Science degree.

Students who successfully complete FT 1311, 1312 and 1313 will be awarded a Certificate of Completion in Fire Protection Technology. This program is approved by the Texas Commission on Fire Protection Personnel Standards and Education.

Recommended Program of Study

First Semester		Second Semester	
FT 131 Fund of Fire Protection	3:3:0	FT 132 Fire Protection Systems	3:3:0
FT 133 Indus Fire Protection I	3:3:0	FT 134 Fire Prevention	3:3:0
Eng 1311 English Composition	3:3:0	FT 135 Ind Fire Protection II	3:3:0
Chm 143 Introductory Chem	4:3:2	Spc 131 Public Speaking	3:3:0
Mth	3:3:0	Chm 144 Introductory Chem	4:3:2
	16:15:2		16:15:2
Third Semester		Fourth Semester	
FT 230 Fire Admin I	3:3:0	FT 233 Hazardous Mat	3:3:0
FT 231 Bldg Codes and Const	3:3:0	FT 234 Fire Admin II	3:3:0
FT 232 Fire and Arson Inves	3:3:0	FT 241 Fire Fighting Tactics	4:3:2
BC 231 Tech Writing	3:3:0	*Approved Electives	9:9:0
Gov 231 Introduction to Amer Gov	3:3:0		
*Approved Elective	3:3:0		
	18:18:0		19:18:2

*Six hours of approved electives must be in FT courses for Texas Commission on Fire Protection Personnel Standards and Education approval.

Fire Protection Technology Courses (FT)

- 1311 Introduction to Fire Protection 3:2:2
Organization of fire departments, general rules and regulations, fire apparatus; first aid; fire alarm and communications.
Prerequisite: Admission to the Basic Certification School for Fire Fighters and consent of instructor.
- 1312 Fire Science 3:1:7
Foreceable entry, fire extinguishers, fire service ladder practices, salvage and overhaul, water supplies, automatic sprinklers, fire science and arson detection.
- 1313 Fire Fighting 3:0:10
Ropes, fire hose practices, fire stream practices, ventilation practices, rescue operations, breathing apparatus, inspection procedures, aircraft fire protection, emergency driving and civil disorders.
- 1314 Related Fire Studies 3:3:0
Effective reading and study skills, fire service mathematics, community relations and report writing.
- 131 Fundamentals of Fire Protection 3:3:0
History and philosophy of fire protection; review of statistics of loss of life and property by fire; introduction to agencies involved in fire protection; current legislative developments and career orientation; recruitment and training for fire departments; position classification and plans; employee organization; a discussion of current related problems and review of expanding future fire protection problems.

- 132. Fire Protection Systems** 3:3:0
Study of the required standard for water supply; special hazards protection systems; automatic sprinkler and special extinguishing system; automatic signalling and detection system; rating organizations and underwriting agencies.
- 133. Industrial Fire Protection I** 3:3:0
Specific concerns and safeguards related to business and industrial organizations. A study of industrial fire brigade organization and development, plant layout, fire prevention programs; extinguishing factors and techniques, hazardous situations and prevention methods.
- 134. Fire Prevention** 3:3:0
The objectives and views of inspections, fundamental principles, methods, techniques and procedures of fire prevention administration. Fire prevention organization; public cooperation and image; recognition of fire hazards; insurance problems and legal aspects; development and implementation of a systematic and deliberate inspection program; survey of local, state and national codes pertaining to fire prevention and related technology; relationship between building inspection agencies and fire prevention organization.
- 135. Industrial Fire Protection II** 3:3:0
Development of fire and safety organizations in industry; relation between private and public fire protection organizations; current trends, deficiencies and possible solutions for industrial fire problems; role of insurance problems and other special organizations; an in-depth study of specific industrial processes; equipment, facilities and work practices to understand potential hazards and techniques to detect and control such hazards.
- 230. Fire Administration I** 3:3:0
An in-depth study of organization and management as related to a fire department including budgeting, maintenance of records and reports and management of fire department officers. Personnel administration and distribution of equipment and personnel and other related topics.
- 231. Building Codes and Construction** 3:3:0
Fundamental consideration and exploration of building construction and design with emphasis on fire resistance of building materials and assemblies, exposures and related data focused on fire protection concerns; review of related statutory and suggested guidelines, both local and national in scope.
- 232. Fire and Arson Investigation** 3:3:0
A study of the detection of arson, investigation techniques, case histories, gathering and preserving of evidence; preparing for a court case; selected discussion of laws, decisions and opinions; kinds of arsonists, interrogation procedures, cooperation and coordination between fire fighters and arson investigators and other related topics.
- 233. Hazardous Materials I** 3:3:0
Study of chemical characteristics and behavior of various materials that burn or react violently related to storage, transportation, handling hazardous materials, i.e., flammable liquids, combustible solids and gases. Emphasis on emergency situation and most favorable methods of handling fire fighting and control.
- 234. Fire Administration II** 3:3:0
Study to include insurance rates and ratings; preparation of budgets; administration and organization of training in the fire department; city water requirements, fire alarm and communications systems; importance of public relations, report writing and record keeping; measurements of results, use of records to improve procedures and other related topics.
- 235. Hazardous Materials II** 3:3:0
Hazardous materials covering storage, handling, laws, standards and fire fighting techniques associated with chemicals, gases, flammable liquids, corrosives, poisons, explosives, rocket propellants and exotic fuel and radioactive materials.
- 236. Field Safety Education** 3:3:0
A survey of physical, chemical and electrical hazards and their relationship to loss of property and/or life. Study of codes, laws, problems and cases. Safe storage, transportation and handling techniques are stressed to eliminate or control potential risks.
- 237. Legal Aspects of Fire Protection** 3:3:0
A study of legal rights and duties, liability concerns and responsibilities of the fire department while carrying out their duties. Introduction and basic concepts of Civil and Criminal law, the Texas and Federal judicial structure and cities' liability for acts of the fire department and fire prevention bureaus. An in-depth study of various cases concerning fire fighters, fire departments, municipalities.
- 238. Fire Service Communications** 3:3:0
The development of fire alarm systems, the various types of systems, installation, operation and testing of the most common systems; receiving, dispatching and radio communication procedures; FCC regulations; the fire alarm operations office; mutual aid systems; fire station communications and facilities; response and fire ground procedures; emergency operations; code and numbering systems; required records and reports; technological advances.

- 241 Fire Fighting Tactics and Strategy** 4:3:2
Essential elements in analyzing the nature of fire and determining the requirements. Efficient and effective utilization of manpower, equipment and apparatus. Emphasis to be placed on pre-planning, study of conflagration problems, fire ground organization problem solving related to fire ground decision making and attack tactics and strategy. Use of Mutual Aid and large scale command problems.

Maintenance Pipefitting

This course of study is provided for persons preparing for, or employed in, the occupation of maintenance pipefitting. The courses may be used as related instruction in company apprentice training programs. Liberal substitution of courses will be allowed in consideration of the diversity of skill requirements among companies in the area. However, a program of study must be agreed upon prior to enrollment.

An Associate of Applied Science Degree will be awarded upon completion of the program of study.

Recommended Program of Study

First Semester		Second Semester	
*Pip 131 Pipefitting	3:3:0	*Pip 134 Pipe Layout	3:3:0
*Pip 132 Potable Water Systems	3:3:0	*Pip 135 Drainage Waste and Vent Systems	3:3:0
*Pip 136 Pipefitting Lab	3:0:7	*Pip 138 Piping Systems Lab I	3:0:7
*Pip 137 Sanitary Systems Lab I	3:0:7	*Pip 139 Sanitary Systems Lab II	3:0:7
TM 132 Fundamentals of Math II	3:3:0	TM 1331 Algebra-Trigonometry	3:3:0
BC 131 Basic Communications	3:3:0	PM 1418 Related Physics	4:3:2
	18:12:14		19:12:16
Third Semester		Fourth Semester	
*Pip 231 Blueprint Reading for Pipefitters	3:3:0	*Pip 234 Field Measurements	3:3:0
*Pip 232 Instrument Piping Systems	3:3:0	*Pip 238 Field Sketching	3:0:7
*Pip 236 Piping Systems Lab II	3:0:7	*RAC 231 Principles of Air Conditioning	3:3:0
*Pip 237 Instrument Piping Techniques	3:0:7	*RAC 236 Forced Air Heating and Cooling Systems	3:0:7
BC 132 Business Communications	3:3:0	Elective	6:6:0
JR 231 Job Relations	3:3:0		
	18:12:14		18:12:14

*A Certificate of Completion will be awarded upon the satisfactory completion of these courses.

Maintenance Pipefitting Courses (Pip)

- 131 Pipefitting** 3:3:0
Methods of fabricating pipe are studied. The use of layout tools, full scale layout methods and practices, layout of miters and saddles and the use of the steel square in pipe layout is stressed.
- 132 Potable Water Systems** 3:3:0
A study of potable water systems, its treatment and protection from contamination. Sizing and installation of water systems will be covered with emphasis on materials and tools needed to accomplish the installation.
- 134 Pipe Layout** 3:3:0
A course in planning, scheduling and laying out of work to be performed by the craftsman. An introduction to the estimation of material, labor and miscellaneous costs.
- 135 Drainage Waste and Vent Systems** 3:3:0
A study of drainage, waste and vent systems including sanitary and storm systems. Tools, materials and maintenance of installations will be discussed in this course.
- 136 Pipefitting Laboratory** 3:0:7
The use of layout tools, full scale layout methods and practices, layout of miters and saddles is studied in this laboratory course.
- 137 Sanitary Systems Laboratory I** 3:0:7
A laboratory course providing practice in the repair, replacement and adjustment of fixtures and appliances used in commercial and industrial installations.
- 138 Piping Systems Laboratory I** 3:0:7
A study of layout problems that includes template making, offset problems, hangers and supports, rigging and hoisting, and other fabrication procedures utilized in the maintenance and repair of process piping systems.
- 139 Sanitary Systems Laboratory II** 3:0:7
A laboratory course in sanitary fixture repairs, adjustments and replacement. Emphasis will be placed on fixtures used in commercial and industrial installations.

231	Blueprint Reading for Pipefitters An introduction to piping drawings, symbols and schematics. Shop fabrication drawings, specifications and material takeoff also will be covered in the course.	3:3:0
232	Instrument Piping Systems A study of the piping required for pressure flow and temperature controllers both transmitting and recording.	3:3:0
234	Field Measurements A study of the use of the transit and level with emphasis on field dimensioning and sketching for fabrication.	3:3:0
236	Piping Systems Laboratory II A continuation of Pip 138 with emphasis on systems layout.	3:0:7
237	Instrument Piping Techniques A laboratory course designed to develop skills in the layout and piping of pneumatic instrument systems and associated equipment.	3:0:7
238	Field Sketching A laboratory course designed to teach field measurements and sketching. Conversion of field sketches to detailed drawings will also be covered in the course.	3:0:7

Occupational Safety and Health

This program is designed to prepare the individual for employment as a safety specialist in business, education or industry. Courses may be taken individually to upgrade persons already employed as safety specialists. Occupational Safety and Health courses will be taught in the evening hours as well as the regular day schedule to accommodate the shift worker.

A graduate of this two-year instructional program is awarded the Associate of Applied Science Degree. A Certificate of Completion will be awarded upon completion of the courses marked with an asterisk. Persons interested in pursuing the Bachelor of Science in Industrial Technology are required to take the alternate general education courses.

Recommended Program of Study

First Semester	Second Semester
*OSH 131 Introduction to Occupational Safety and Health..... 3:3:0	*OSH 133 Physical Hazards Control I..... 3:3:0
*OSH 132 Safety and Health Standards, Codes and Regulations..... 3:3:0	*OSH 134 Vehicle and Traffic Safety..... 3:3:0
BC 131 Basic Communications or English Composition..... 3:3:0	IS 1325 Industrial Communications I or Spc 131..... 3:3:0
TM 132 Fundamentals of Math II or Mth 1334..... 3:3:0	MM 138 Fundamentals of Supervision..... 3:3:0
Chm 143 Introductory..... 4:3:2	*JR 232 Human Relations, or + Soc..... 3:3:0
	PM 1418 Related Physics or Phy 141 General Physics..... 4:3:2
	16:15:2
	19:18:2
Third Semester	Fourth Semester
*OSH 231 Physical Hazards Control II..... 3:3:0	*FT 135 Industrial Fire Protection II..... 3:3:0
*OSH 232 Health Hazard Recognition..... 3:3:0	*OSH 253 Industrial Hygiene Measurement..... 5:3:4
*FT 133 Industrial Fire Protection I..... 3:3:0	*OSH 233 Human Factors in Safety..... 3:3:0
IS 1326 Industrial Communications II or Eng 4335..... 3:3:0	*OSH 234 Safety Program Management..... 3:3:0
IS 1312 Applied Supervision..... 3:3:0	** Elective..... 3:3:0
** Elective..... 3:3:0	
18:18:0	17:15:4

*A Certificate of Completion will be awarded upon the satisfactory completion of these courses.
 **Persons desiring to continue in the Bachelor of Science in Industrial Technology will be required to take Math 1341 in place of one of these electives

Occupational Safety and Health Courses (OSH)

131	Introduction to Occupational Safety and Health An introduction to the principles of occupational safety and health. A survey course covering the basic principles and techniques. Required for OSH majors and suitable for management and supervisory certificate students.	3:3:0
132	Safety and Health Standards, Codes and Regulations A review of the important occupational safety and health standards and codes with particular emphasis on application of the codes to typical work situations as prescribed by the Occupational Safety and Health Act of 1970.	3:3:0

133	Physical Hazards Control I	3:3:0
	An in-depth study of the basic responsibilities and techniques for safety inspections and control of, or removal of hazards from the site.	
134	Vehicle and Traffic Safety	3:3:0
	A basic introduction to problems and practices of vehicle and traffic safety programming with emphasis on regulatory requirements.	
231	Physical Hazards Control II	3:3:0
	Continuation of physical hazards inspections and studies in the work environment. Covers the principles of protective equipment, guarding, material handling, chemical and electrical hazards and illuminations.	
232	Health Hazard Recognition	3:3:0
	The subject matter of the course deals with the fundamentals of industrial hygiene and surveying techniques.	
233	Human Factors in Safety	3:3:0
	Designed to acquaint the student with the physiological and psychological factors that contribute to accident causation. An exploration of theoretical and research findings.	
234	Safety Program Management	3:3:0
	Designed to acquaint the student with the common elements of a modern safety program covering management responsibility, roles of committees, budgeting maintenance and accident investigation.	
235	Security Administration	3:3:0
	Organization, administration and management of security and plant protection units. Personnel and budgeting.	
253	Industrial Hygiene Measurements	5:3:4
	Methods of hazard evaluation will be studied in this course including gas and vapor sampling, air flow measurements, particulate sampling, industrial ventilation, heat stress, radiation and noise.	

Plant Maintenance and Operations

This course of study is provided for persons engaged in the maintenance and operations of the various petrochemical plants in the area.

Objectives of this program are to reinforce the practical work skills developed by the student as a result of his/her work experience and to insure that he/she has the necessary skills to maintain a position and fulfill a vital role in area industry.

A person who completes 30 semester hours of Plant Maintenance courses, or approved related courses, is awarded a Certificate of Completion in Plant Maintenance and Operations. Some Plant Maintenance courses are offered at Port Arthur and Orange, but students must enroll in courses on the main campus to complete the program.

Plant Maintenance and Operations Courses (PM)

1311	Compressors	3:3:0
	The application, operation and maintenance of air and gas compressors, proper installation and power requirements.	
1312	Pumps	3:3:0
	The application, care and operation of centrifugal rotary and reciprocating pumps and the study of direct and belt drives.	
1313	Pumps Laboratory	3:0:6
	Diagnosis and remedy of pump malfunctions will be covered in this laboratory course. Replacement of seals, couplings and impellers; alignment; and disassembly for inspection will be emphasized in this course.	
1418	Related Physics	4:3:2
	A study of matter, energy, mechanics, heat and basic electrical principles as they relate to the refining and chemical processes.	
1419	Related Chemistry	4:3:2
	A study of organic and inorganic chemistry, the safety consideration in the handling of chemicals and the physical properties of organic homologs.	
1320	Unit Operations	3:3:0
	This course will include an investigation of fluid flow and transport, distillation, evaporation, extraction and other unit functions.	
1321	Blueprint Reading	3:3:0
	A study of lines, views, symbols and dimensions involved in reading blueprint and shop sketches. Practice in making freehand sketches of simple objects.	

1322	Structural Blueprint Reading	3:3:0
	A study of the various engineering drawings and specifications used in the fabrication and erection of structural steel members.	
1324	Blueprint Reading for Pipefitters	3:3:0
	An introduction to piping drawings, symbols and schematics. Shop fabrication drawings, specifications and material take-off also will be covered in the course.	
1328	Marine Blueprint Reading	3:3:0
	A study of marine and shipbuilding blueprints, and the symbols and conventions relating to them. The course also includes a study of A.I.S.C. standards and specifications.	
1329	Industrial Blueprint	3:3:0
	A study of plot plans, foundation drawings, schedules, sections and specifications used in commercial and industrial construction.	
1333	Construction Estimating	3:3:0
	A study of building codes, plans, specifications, contracts, and the general techniques of estimating building construction costs.	
1340	Industrial Hydraulics	3:3:0
	The operation and maintenance of hydraulic equipment, including basic hydraulics and all types of pumps, motors and controls, will be studied in this course.	

Special Training Activities

The purpose of Special Training Activities is to serve the educational and training needs of adults by offering short courses, workshops and conferences designed to achieve a specific objective. The flexibility of these training activities allows the College of Technical Arts to react quickly to a training need expressed by industrial firms, governmental agencies or groups of concerned individuals. Technical Arts, in cooperation with the Division of Public Service, negotiates the nature and length of the training with the group requesting the training. College facilities, equipment and faculty are available to insure that the training objective is successfully achieved.

Special Training Activities include:

Defensive Driving Classes: National Safety Council approved classes in defensive driving are offered regularly by the College of Technical Arts. Successful completion of the eight hour class allows students to receive a reduction in their automotive insurance rates as well as learn safe driving techniques.

Industrial Safety Conference: Faculty members in the Fire Protection Technology and Occupational Safety and Health programs periodically sponsor safety related conferences and workshops. Recent workshops covered safety for supervisors and OSHA regulations.

Industrial Start-Up Training: New industries and existing firms undergoing expansions may qualify for industrial start-up training operated by Lamar and funded by the Texas Education Agency. To date, several extensive training programs have been conducted by Adult Training.

Lamar IMI Maintenance Training Institute: The International Maintenance Institute in conjunction with Adult Training Programs offers a continuing series of seminars and workshops on various topics of interest to maintenance trainees, mechanics and supervisors.

Motorcycle Safety: The Motorcycle Safety Course is offered by the Fire and Safety Institute in conjunction with the Motorcycle Safety Foundation. The course offers twenty hours of training and is designed for the beginner or novice rider. Motorcycle insurance and instructive material used in the course are provided by the institute.

Alcohol Awareness: The Alcohol Awareness program is aimed at the young offender (13-21) and is offered in conjunction with the local Justices of the Peace. The three hour course is a night course which is held twice a month and discusses the psychological, physiological, and legal aspects of involvement with alcohol.

Child Care Staff Training: Workshops are held periodically to provide in-service training for day care personnel and the other persons working with pre-school age children. On-site training is also available for individual centers.

Volunteer Fire Fighter Program: This program is designed to facilitate the certification of volunteer fire fighters by providing monthly, all day training sessions in the subject areas required by the Commission on Fire Protection Standards and Personnel.

Truck Driving: This course is designed to prepare persons for employment as operators of tractor trailers in interstate commerce. Extensive highway driving coupled with preparation for the D.O.T. certification and Texas Commercial Operators examination plus a defensive driving course and certification are included in the instruction.

Industrial Fire Training: One and two-day courses are offered for fire brigade members in business and industry. These programs meet the training requirements specified in the OSH Act regulations.

Fire and Safety Institute: The Lamar University Fire and Safety Institute was officially recognized in the Spring of 1982. The Institute concept will combine existing fire and safety related programs, both credit and non-credit, into a cohesive organizational structure to provide training to local business and industry.

Information concerning Special Training Activities can be obtained from the supervisor of adult training. The telephone number of this office is 409 838-8207.

Industrial Department

Department Head: M. Paul Roy

220 Beeson Technical Arts Building

Appliance Repair

Appliance Repair is a one-year program designed to prepare persons for employment in the installation and repair of domestic appliances. With practically every household equipped with clothes washers, clothes dryers, ranges, disposals and hot water heaters the need for qualified service personnel increases from month to month. Servicing the varied types of appliances, which are built by different manufacturers, requires skills in both mechanics and electricity.

The Appliance Repair program provides experiences which afford opportunity to develop an understanding of electrical and mechanical principles, safety, and the related occupational information necessary to service appliances.

Students successfully completing the required 33 semester hours may apply for the Certificate of Completion in Appliance Repair.

Recommended Program of Study

First Semester	Second Semester
AR 131 Basic Principles of App..... 3:3:0	AR 134 Appliance Problem Analysis..... 3:3:0
AR 132 Applied Electrical Circuitry..... 3:3:0	AR 135 Electro-Mechanical Troubleshooting..... 3:3:0
AR 136 Basics of Appliance Mechanics..... 3:0:7	AR 138 Major Kitchen Appliances..... 3:0:7
AR 137 Laundry Appliances..... 3:0:7	AR 139 Water Heater Analysis..... 3:0:7
TM 131 Fundamentals of Math I..... 3:3:0	TM 132 Fundamentals of Math II..... 3:3:0
BC 131 Basic Communication..... 3:3:0	
18:12:14	15:9:14

Appliance Repair Courses (AR)

- 131 **Basic Principles of Appliances** 3:3:0
The history of home appliances. Current trends in appliance service and repair. Information and data required for servicing. Electrical and mechanical functions.
- 132 **Applied Electrical Circuitry** 3:3:0
Sources of electricity. DC and AC circuits. Electric motors, wiring diagrams, connectors, Volt, ohm, watt and amp meters. Timing switches. Transformers. Relays. Wiring.
- 134 **Appliance Problem Analysis** 3:3:0
Study of appliance failures for cause determination. Inspection of damaged components. Systematical search to classify trouble. Electrical and mechanical data appraisal.
- 135 **Electro-Mechanical Troubleshooting** 3:3:0
Failure causes due to abuse or normal wear. Electrical meters and wiring diagrams. Transmissions; motor capacitors, switches and solenoids. Bearings, belts and pumps.
- 136 **Basics of Appliance Mechanics** 3:0:7
Disassembly and assembly of domestic appliances. Tracing mechanical and electrical power utility. Testing procedures. Use of manuals and diagrams.
- 137 **Laundry Appliances** 3:0:7
Proper installation methods for clothes washers and dryers. Service procedures for mechanical and electrical components. Motors, timers, pumps, overload protectors.
- 138 **Major Kitchen Appliances** 3:0:7
A study of service procedures for ranges, disposals, ovens and dishwashers. Heavy emphasis on repair of specific units.
- 139 **Water Heater Analysis** 3:0:7
Proper installations for natural gas and electric water heaters, controlling temperatures thermostatically. Safety controls. Trouble shooting and maintenance.

Diesel Mechanics

The two-year diesel mechanics program is designed to prepare the graduate for a career in the operation, repair and maintenance of diesel engines.

Diesel engines provide power for transportation equipment such as heavy trucks, buses and locomotives. They are used in every type of farming and harvesting equipment. Heavy equipment and stationery engines for pumps and compressors use diesel engines also.

To effectively repair an engine which does not perform, the mechanic must be able to isolate the cause of the problem, repair or replace defective parts, make adjustments and test the engine.

Objectives of the diesel mechanics program include opportunities to learn the design and construction of diesel engines, experiences in their disassembly and repair, tuneup, trouble-shooting electrical and hydraulic problems, and preventive maintenance.

A graduate of this instructional program is awarded the Associate of Applied Science degree.

Recommended Program of Study

First Semester	Second Semester
DM 131 Introduction to Diesel Mech..... 3:3:0	DM 134 Related Sys..... 3:3:0
DM 132 Diesel Cycle Appl..... 3:3:0	DM 135 Maint and Repair Prob..... 3:3:0
DM 136 Basic Shop Proc..... 3:0:7	DM 138 Tune-up..... 3:0:7
DM 137 Precision Inst Usage..... 3:0:7	DM 139 Accessory Serv..... 3:0:7
TM 131 Fundamentals of Math I or Approved Mth (Math Dept)..... 3:3:0	TM 132 Fundamentals of Math II or Approved Mth (Math Dept)..... 3:3:0
BC 131 Basic Communications or Eng Comp (Eng Dept)..... 3:3:0	BC 132 Business Communications or Eng Comp (Eng Dept)..... 3:3:0
<u>18:12:14</u>	<u>18:12:14</u>
Third Semester	Fourth Semester
DM 231 Ignition and Comb Prin..... 3:3:0	DM 234 Overhaul Proc..... 3:3:0
DM 232 Diesel Fuel and Lub..... 3:3:0	DM 235 Fuel Injec System..... 3:3:0
DM 236 Troubleshooting and Install..... 3:0:7	DM 238 Dynamometer Oper and Anal..... 3:0:7
DM 237 Adv Diesel Eng Maint..... 3:0:7	DM 239 Diesel Eng Hydr..... 3:0:7
TM 231 Applied Geometry..... 3:3:0	TM 232 Industrial Math..... 3:3:0
JR 231 Job Relations or Soc 131 Introduction to Sociology..... 3:3:0	Elective..... 3:3:0
<u>18:12:14</u>	<u>18:12:14</u>

¹By Approval

Suggested Technical Arts electives: BC 231; JR 232; MM 131, 132, 134, 135, 138, 231; MT 133; Wld 133; Dft 133; IET 133; TM 134; BDP 131.

Diesel Mechanics Courses (DM)

131	Introduction to Diesel Mechanics General description and construction of engines, diesel engine principles, frames, cylinders, heads and pistons.	3:3:0
132	Diesel Cycle Application The diesel cycle, its advantages and applications. The basic problems of operations and the design and construction of diesel engines are studied.	3:3:0
133	Small Engines The operation and repair of small internal combustion engines. Diagnosis and troubleshooting will be emphasized.	3:3:0
134	Related Systems Engine cooling, air intake systems, exhaust systems and starting systems. <i>Prerequisite: DM 131 and 132.</i>	3:3:0
135	Maintenance and Repair Problems Maintenance and repair problems of the diesel engine. The checking of bearing clearances and the installation of piston rings are stressed. <i>Prerequisite: DM 131 and 132.</i>	3:3:0
136	Basic Shop Procedures Installation, operation, maintenance and repair of diesel engines; hand tools and precision instruments, shop safety, fastening devices and tubing fabrication.	3:0:7
137	Precision Instrument Application Installation, operation, maintenance and repair of diesel engines; disassembly, measuring, checking for wear, proper assembly, correct use of taps and dies, flaring tools and torque wrenches.	3:0:7
138	Tune-up and Repair Valve reconditioning, cylinder head repairs, engine operation and testing, diesel engine operation, shop safety, engine adjustments, cylinder and piston reconditioning. <i>Prerequisite: DM 136 and 137.</i>	3:0:7

- 139 Accessory Servicing** 3:0:7
Repair of water pumps, oil pumps, fuel pumps, blowers, minor engine tune-up, valve and turbocharger repair.
Prerequisite: DM 136 and 137.
- 231 Ignition and Combustion Principles** 3:3:0
Electrical systems, governors, fuels and combustion and fuel systems.
Prerequisite: DM 131 and 132.
- 232 Diesel Fuel and Lubrication** 3:3:0
A comprehensive study of diesel fuel and lubricating oils. Basic electricity, electrical and gasoline starting systems are also stressed.
Prerequisite: DM 131 and 132.
- 234 Overhaul Procedures** 3:3:0
Engine overhauling, special repairs, salvaging, hydraulics and terms used in diesel engineering.
Prerequisite: DM 231 and 232 or DM 134 and 135.
- 235 Fuel Injection Systems** 3:3:0
Fuel injection systems, hydraulics and its application, engine tune-up and troubleshooting.
Prerequisite: DM 231 and 232 or DM 134 and 135.
- 236 Troubleshooting and Installation** 3:0:7
Installation, operation, maintenance and repair of diesel engines, electrical systems, generators, alternators, cranking motors, regulators, governors, steering clutches, final drives, track and roller frames.
Prerequisite: DM 138 and 139 or DM 136 and 137.
- 237 Advanced Diesel Engine Maintenance** 3:0:7
Installation, operation, maintenance and repair of diesel engines, fuel systems, oil pumps, filters, oil pressure regulators, natural gas carburetors, natural gas regulators and preventive maintenance.
Prerequisite: DM 138 and 139 or DM 136 and 137.
- 238 Dynamometer Operation and Analysis** 3:0:7
Installation, operation, maintenance and repair of diesel engines, fuel injection systems, fuel injection pumps, injector nozzles, unit injectors. Engine performance, testing and engine dynamometer.
Prerequisite: DM 236 and 237 or DM 138 and 139.
- 239 Diesel Engine Hydraulics** 3:0:7
Installation, operation, maintenance and repair of diesel engines, hydraulic pumps, hydraulic controls, hydraulic power applications, advanced engine overhaul, special repairs, diagnosing and tune-up.
Prerequisite: DM 236 and 237 or DM 138 and 139.

Machine Tools

The machine tools program is a two-year program of study directed toward preparing the graduate with the skills, knowledge and perceptions needed to advance in industry as a competent craftsman.

The machinist must set up and operate the standard machine tools, grind his cutting tools, and machine parts to the specifications on a drawing or blueprint. Machinists use precision measuring instruments to insure parts are correct to very close tolerances. These duties require the machinist to be able to work independently.

Because they often carry through all operations, machinists may use the drill press, lathe, milling machine, grinder and other machines to complete individual parts. Students therefore are consistently encouraged to develop responsibility and self-reliance.

Students of this program study cutting tools and materials and will use metal removing machines in the shop to advance their abilities. Graduates are awarded the Associate of Applied Science degree.

Recommended Program of Study

First Semester	Second Semester
MT 131 Introduction to Hand and Mac Tools 3:3:0	MT 134 Milling Machines 3:3:0
MT 132 Fund of Lathe 3:3:0	MT 135 Introduction to Grinding Mac 3:3:0
MT 136 Basic Drill Press and Lathe 3:0:7	MT 138 Milling Processes 3:0:7
MT 137 Bench Tools and Layout 3:0:7	MT 139 Milling and Grinding Proc 3:0:7
TM 131 Fundamentals of Math I or Approved Mth (Math Dept) 3:3:0	TM 132 Fundamentals of Math II or Approved Mth (Math Dept) 3:3:0
BC 131 Basic Communications or Eng Comp (Eng Dept) 3:3:0	BC 132 Business Communications or Eng Comp (Eng Dept) 3:3:0
18:12:14	18:12:14
Third Semester	Fourth Semester
MT 231 Adv Lathe and Drill Press 3:3:0	MT 234 Adv Grinding and Milling Tech 3:3:0
MT 232 Appl of Lathe and Drill Press 3:3:0	MT 235 Prob in Grinding and Milling 3:3:0
MT 236 Multi-Machine Projects 3:0:7	MT 238 Layout and Set-up 3:0:7
MT 237 Gauges and Inspection 3:0:7	MT 239 Mach Design and Maint 3:0:7
TM 231 Applied Geometry 3:3:0	TM 232 Ind Math 3:3:0
JR 231 Job Relations or Soc 131 Introduction to Sociology 3:3:0	Elective† 3:3:0
18:12:14	18:12:14

†By Approval

Suggested Technical Arts electives: MM 131, 132, 135, 138, 231; BC 231; JR 232; DM 133; Dft 133; IET 133; Wid 133, 235; TM 133, 134; BDP 131.

Machine Tools Courses (MT)

131	Introduction to Hand and Machine Tools Study of hand and machine tools used in the machine shop, with emphasis on safety, measuring tools, layout and drilling machines. Basic blueprint reading.	3:3:0
132	Fundamentals of the Lathe Consideration of the engine lathe, its uses and capabilities. Basics of material selection. Cut-off machines. Blueprint interpretation.	3:3:0
133	Machine Shop Practice in the use of hand and machine tools of the modern machine shop.	3:3:1-3
134	Milling Machines Applications of vertical and horizontal milling machines. Setups and operations. Gears. Indexing devices. Vertical band machines. Blueprint interpretation.	3:3:0
135	Introduction to Grinding Machines Grinding machines, grinding wheels and cutter sharpening. Shapers, planers and their uses. Basic metal heat treatment. Blueprints.	3:3:0
136	Basic Drill Press and Lathe A laboratory study with use of various hand and machine tools. Special emphasis is placed on safety, bench work, the lathe and drill press.	3:0:7
137	Bench Tools and Layout A continuation of the development of manipulative skills with bench tools, gauges, layout and setups common to the drill press, lathe and shaper.	3:0:7
138	Milling Process Typical processes, jobs and setups are employed to further develop skills and understanding of the machining process. Additional projects are aimed at gaining experience with companion machine tools.	3:0:7
139	Milling and Grinding Procedures Additional emphasis is placed on implementation of different types of mills and their attachments. The association of the grinder with the mill is introduced.	3:0:7
231	Advanced Lathe and Drill Press Lathe, drill press and details of layout, set up and operations are extended. Continued emphasis on blueprint interpretations. <i>Prerequisite: MT 131 and 132.</i>	3:3:0
232	Applications of Lathe and Drill Press Problems encountered in diverse applications of lathes and drill presses. Precision measuring and gauging instruments. Further blueprint study. <i>Prerequisite: MT 131 and 132.</i>	3:3:0

- 234 **Advanced Grinding and Milling Techniques** 3:3:0
Advanced treatment of various machine tools involved in planing, milling, and grinding of metals. Problems in blueprint reading.
Prerequisite: MT 134 and 135.
- 235 **Problems in Grinding and Milling** 3:3:0
Further discussion of grinding and milling principles and problems. Fundamental treatment of hydraulics as applied to machine tools. Advanced study of blueprints and sketches.
Prerequisite: MT 134 and 135.
- 236 **Multi-Machine Projects** 3:0:7
Jobs and processes involving the use of various machine tools with close tolerances throughout. Stress is placed on improving time consumption.
Prerequisite: MT 136 and 137.
- 237 **Gauges and Inspection** 3:0:7
A continuation of the development of manipulative skills with additional practice in close tolerance measuring and inspection.
Prerequisite: MT 136 and 137.
- 238 **Layout and Setup for Mills and Grinders** 3:0:7
Laboratory practice in the proper procedures and methods for layout and setup. Tool and cutter grinding is treated. Time utilization and accuracy are pronounced.
Prerequisite: MT 138 and 139.
- 239 **Machine Design and Maintenance** 3:0:7
Maintenance and repair of laboratory machine tools is implemented to expand ability and manipulative skills. Assembly projects which involve several machine tools are promoted.
Prerequisite: MT 138 and 139.

Refrigeration and Air Conditioning Technology

The refrigeration and air conditioning industry has expanded to include all phases of food preservation and temperature control for human comfort. In addition, many industrial processes require a product be heated or cooled to specific levels to create special compounds.

The refrigeration and air conditioning technology program offers two alternatives in its training. With successful completion of specific courses, students may apply for the Certificate of Completion in Refrigeration. Completion of the two-year program, as listed below, will earn the graduate an Associate of Applied Science degree.

Students will receive experiences which provide opportunity for learning the mechanical and electrical principles of environmental control equipment. They will also receive practice in installation, trouble shooting inoperative equipment, and performing preventive maintenance on air conditioning and refrigeration equipment.

Recommended Program of Study

First Semester	Second Semester
RAC 131 Basic Refrig Prin* 3:3:0	RAC 134 Refrig Theory* 3:3:0
RAC 132 Basic Elec and Elec Devices* 3:3:0	RAC 135 Comm Refrig* 3:3:0
RAC 136 Basic Refrig* 3:0:7	RAC 138 Basic Refrig and Service Proc* 3:0:7
RAC 137 Basic Elec Wiring and Testing Proc* 3:0:7	RAC 139 Basic Elec Wiring and Control Systems* 3:0:7
TM 131 Fundamentals of Math I or Approved Mth (Math Dept) 3:3:0	TM 132 Fundamentals of Math II or Approved Mth (Math Dept) 3:3:0
BC 131 Basic Communications or Eng Comp (Eng Dept) 3:3:0	BC 132 Business Communications or Eng Comp (Eng Dept) 3:3:0
18:12:14	18:12:14
Third Semester	Fourth Semester
RAC 231 Prin of Air Cond 3:3:0	RAC 234 Adv Air Cond 3:3:0
RAC 232 Load Estimation, Heating and Cooling 3:3:0	RAC 235 Cooling Towers 3:3:0
RAC 236 Forced Air Heating and Cooling Sys 3:0:7	RAC 238 Adv Air Cond 3:0:7
RAC 237 Air Cooled Heating and Cooling Sys 3:0:7	RAC 239 Heat Pumps and Absorption Sys 3:0:7
TM 231 Applied Geometry 3:3:0	TM 232 Ind Math 3:3:0
JR 231 Job Relations or Soc 131 Introduction to Sociology 3:3:0	Elective† 3:3:0
18:12:14	18:12:14

†By Approval

*These courses are required for a Certificate of Completion in Refrigeration.

Suggested Technical Arts electives: MM 131, 132, 135, 138, 231; BC 231; JR 232; DM 133; Dr 133; IET 133; Wld 133; BDP 131.

Refrigeration and Air Conditioning Technology Courses (RAC)

- 131 **Basic Refrigeration Principles** 3:3:0
The history of refrigeration, theory of heat, compression cycle, metering devices and components of the refrigeration cycle.
- 132 **Basic Electricity and Electrical Devices** 3:3:0
Servicing domestic refrigeration, heat loads, defrosting, basic electric controls, wiring diagrams, capacitors and relays.
- 134 **Refrigeration Theory** 3:3:0
Related knowledge in chemistry necessary for refrigeration, cooling coil and condenser design, refrigerant flow controls, electrical control requirements, manufacturers' tables, charts, diagrams and engineering specification sheets. Safety to be used in refrigeration work.
Prerequisite: RAC 131 and 132.
- 135 **Commercial Refrigeration** 3:3:0
Introduction to and history of commercial refrigeration trade. Knowledge necessary in servicing and repairing electrical motors, motor controllers, measuring power in electrical circuits, calculating compressor tonnage capacities, steps in the systematic analysis of refrigeration circuits and applications of commercial refrigeration.
Prerequisite: RAC 131 and 132.
- 136 **Basic Refrigeration** 3:0:7
Methods of cutting, flaring and bending copper tubing, soldering (hard and soft), leak testing, evacuating and charging of reciprocating equipment. Gauge installation, removal and calibration.
- 137 **Basic Electrical Wiring and Testing Procedure** 3:0:7
Electric motors, controls and transformers. Finding common start and run on sealed units, changing motor starting switches, testing and wiring single phase and shaded pole motors.
- 138 **Basic Refrigeration and Service Procedure** 3:0:7
Adding and removing refrigerant, repair of domestic refrigerators and freezers. Tracing and installation of refrigeration circuits, leak testing, evacuating and system charging.
Prerequisite: RAC 136 and 137.
- 139 **Basic Electrical Wiring and Control Systems** 3:0:7
Commercial refrigeration. Installation of time clocks, automatic defrosting and pressure defrost. Wiring of low pressure controls, magnetic starters and temperature controls.
Prerequisite: RAC 136 and 137.
- 231 **Principles of Air Conditioning** 3:3:0
Refrigeration for summer comfort cooling systems, air cycles, properties of air, psychrometric processes, application of warm air heating systems, sizing and balancing air ducts, and application and selection of humidification equipment.
Prerequisite: RAC 134 and 135.
- 232 **Load Estimation, Heating and Cooling** 3:3:0
Estimation of summer cooling loads, winter heat loss, refrigeration for comfort cooling and air conditioning, automatic controls for heating and cooling systems and interpretation of electrical wiring schematics.
Prerequisite: RAC 134 and 135.
- 234 **Advanced Air Conditioning** 3:3:0
Air conditioning survey for commercial and/or residential system design, cost estimates, codes, calculations for conditioned air supply, fan types, room air conditioning and heat pumps.
Prerequisite: RAC 231 and 232.
- 235 **Cooling Towers** 3:3:0
Selecting, sizing and installing cooling towers, piping and pumps. Central station equipment, water chillers, boilers, absorption refrigeration, refrigerant piping data, steam lines, electrical data and tools of the estimator.
Prerequisite: RAC 231 and 232.
- 236 **Forced Air Heating and Cooling** 3:0:7
Skills in the correct use of instruments, fitting and installing ducts, service of limit switches, fan controls, blowers and filters. Setting and checking oil failure switches.
Prerequisite: RAC 138 and 139.
- 237 **Air Cooled Heating and Cooling Systems** 3:0:7
Installation and service of residential and commercial cooling and heating systems. Electronic air cleaners. Humidification equipment. Capacity testing by refrigeration and air methods.
Prerequisite: RAC 138 and 139.

- 238 **Advanced Air Conditioning** 3:0:7
Sizing, installing and checking small tonnage commercial air conditioning systems. Design and installation of primary and secondary electrical circuits. Sizing, installation and capacity testing water pumps and water circuits for air conditioning systems. Capacity testing refrigerant circuits. Acidizing condensers.
Prerequisite: RAC 236 and 237.
- 239 **Heat Pumps and Absorption Systems** 3:0:7
Installation, operation, maintenance and repair of natural gas systems. Total electric heating and cooling systems, electrical circuits, electronic instruments, three phase motors and controls.
Prerequisite: RAC 236 and 237.

Welding

Welding concerns the various processes of joining metal parts together. It is the most common method for permanently connecting the sections necessary for building drilling rigs, pipelines, ships, bridges and many other manufactured units. The welding program is designed to prepare the student for a career in the field of industrial welding, either as a competent welder or in a position which requires knowledge of welding and welding equipment.

Welding requires manual dexterity, good eyesight and eye-hand coordination. Competence in oxyacetylene welding, arc welding and inert gas welding demands concentration and attention to the job being done. The student is given instruction in the safe and efficient methods for the different types of welding methods and procedures. Students' welds are regularly tested in ways common to industry in order to determine their quality.

Students who complete the required twenty-four semester hours of welding courses may apply for the Certificate in Plate Welding. Students who successfully complete the entire program are awarded the Associate of Applied Science degree.

Recommended Program of Study

First Semester	Second Semester
Wld 131 Oxyacetylene Welding* 3:3:0	Wld 134 Arc Cutting; Metal Surfacing and Resistance Welding* 3:3:0
Wld 132 AC-DC Welding, Oxyacetylene Cutting* 3:3:0	Wld 135 AC-DC Equipment and Supplies, Brazing and Braze Welding* 3:3:0
Wld 136 Flat, Horizontal and Vertical Plate Welding* 3:0:7	Wld 138 Flat and Horizontal Vee-Groove Welding* 3:0:7
Wld 137 Vertical and Overhead Plate Welding* 3:0:7	Wld 139 Vertical and Overhead Vee-Groove Welding* 3:0:7
TM 131 Fundamentals of Math I or Approved Mth (Math Dept) 3:3:0	TM 132 Fundamentals of Math II or Approved MTH (Math Dept) 3:3:0
BC 131 Basic Communications or Eng Comp (Eng Dept) 3:3:0	BC 132 Business Communications or Eng Comp (Eng Dept) 3:3:0
18:12:14	18:12:14
Third Semester	Fourth Semester
Wld 231 Weld Tests and Inspection, Pipe Welding and Layout 3:3:0	Wld 234 Special Welding and Cutting Processes 3:3:0
Wld 232 Inert Gas Arc Welding, Equipment and Supplies 3:3:0	Wld 235 Production, Heat Treatment and Identification of Metals 3:3:0
Wld 236 Introduction to Inert Gas Welding and Pipe Welding 3:0:7	Wld 238 Introduction to Butt Welds in Pipe 3:0:7
Wld 237 Layout and Fabrication of Pipe 3:0:7	Wld 239 Advanced Pipe Welding 3:0:7
TM 231 Applied Geometry 3:3:0	TM 232 Ind Math Elective 3:3:0
JR 231 Job Relations or Soc 131 Introduction to Sociology 3:3:0	
18:12:14	18:12:14

*By Approval
*These courses are required for a Certificate of Completion in Plate Welding.
Suggested Technical Arts electives: MM 131, 132, 135, 138, 231; BC 231; JR 232; DM 133; Dft 133; IET 133; MT 133; TM 133, 134.

Welding Courses (Wld)

- 131 **Oxyacetylene Welding** 3:3:0
A study of oxyacetylene welding. Types, and proper use, of various torches and tips. Welding tools and materials, and their relation to the welding process. Welding safety. Blueprint reading.

- 132 **AC-DC Welding, Oxyacetylene Cutting** 3:3:0
Proper methods employed in AC-DC shielded metal arc welding (SMAW) and oxyacetylene cutting. Soldering and soldering alloys. Safety. Blueprint reading continued.
- 133 **Welding as an Elective** 3:3:1-3
Arc welding, SMAW in the flat, horizontal, vertical and overhead positions. Oxyacetylene cutting and welding.
- 134 **Arc Cutting, Metal Surfacing and Resistance Welding** 3:3:0
Studies of carbon-arc, air carbon-arc, metallic electrodes and oxygen-arc cutting processes. Metal surfacing (Hard Surface) and resistance welding. Blueprint reading.
Prerequisite: Wld 131 and 132.
- 135 **AC-DC Equipment and Supplies. Brazing and Braze Welding** 3:3:0
A thorough study of AC and DC welding electrodes and arc welding equipment and supplies. Brazing and braze welding are also studied. Emphasis on blueprint interpretation.
Prerequisite: Wld 131 and 132.
- 136 **Flat, Horizontal and Vertical Plate Welding** 3:0:7
Multiple pass fillet welding using the SMAW process (Shielded Metal Arc Welding). Various types and sizes of electrodes will be used. Introduction to oxyacetylene welding and cutting. Welding safety.
- 137 **Vertical and Overhead Plate Welding** 3:0:7
A continuation of multiple-pass fillet welding using the SMAW process. Oxyacetylene welding and cutting practice is extended. Emphasis on safety.
- 138 **Flat and Horizontal Vee-Groove Welding** 3:0:7
Vee-groove welding of plate in the flat and horizontal positions using the SMAW process. Introduction to destructive and non-destructive welding test procedures.
Prerequisite: 136 and 137.
- 139 **Vertical and Overhead Vee-Groove Welding and Brazing** 3:0:7
Vee-groove welding of plate in the vertical and overhead positions using the SMAW process. Focus on destructive and non-destructive tests.
Prerequisite: Wld 136 and 137.
- 231 **Weld Tests and Inspection. Pipe Welding and Layout** 3:3:0
An in-depth study of welding tests and their uses. Introduction to pipe, pipe fittings and layout as used in the welding field. Sketching and blueprint reading extended.
Prerequisite: Wld 131 and 132.
- 232 **Inert Gas Arc Welding, Equipment and Supplies** 3:3:0
An introduction to GTAW (Gas Tungsten Arc Welding) and GMAW (Gas Metal Arc Welding), equipment and supplies. Development of the principles and uses of these processes. Blueprint reading and layout.
Prerequisite: Wld 131 and 132.
- 233 **Basic Metallurgy** 3:3:0
A basic course in metals' structure, foundry practices, heat treatments, welding, machining and testing procedures. Intended for persons working with, or involved with metals.
- 234 **Special Welding and Cutting Processes** 3:3:0
A study of materials (ferrous and non-ferrous) and processes that require special techniques for welding and cutting. Continuation of blueprint reading and layout.
Prerequisite: Wld 134 and 135 or Wld 231 and 232.
- 235 **Production, Heat Treatment and Identification of Metals** 3:3:0
An introduction to welding metallurgy, metal manufacture, metal identification and heat treatment. Blueprint interpretation and pipe layout continued.
Prerequisite: Wld 134 and 135, or Wld 231 and 232.
- 236 **Introduction to Inert Gas Welding and Pipe Welding** 3:0:7
Introduction to the "TIG" process (GTAW) for carbon steel, aluminum and stainless steels. Fabrication of various projects used in industry. Introduction to pipe welding and plasma arc cutting (PAC).
Prerequisite: Wld 136 and Wld 137.
- 237 **Layout and Fabrication of Pipe** 3:0:7
A continuation of the "TIG" and "MIG" (GMAW) welding methods. Concentrated instruction in the layout, fabrication and welding of ferrous metals and pipe. Continuation of plasma arc cutting (PAC).
Prerequisite: Wld 136 and 137.
- 238 **Introduction to Butt Welds in Pipe** 3:0:7
Horizontal and vertical pipe welding (position 1G and 2G) with shielded metal arc welding (SMAW) and "TIG" (GTAW). Continued "MIG" (GMAW) welding. Plasma arc cutting.
Prerequisite: Wld 138, and 139 or Wld 236 and 237.

239 **Advanced Pipe Welding**

3:07

Concentration on pipe welding in the vertical fixed and "Arkansas-Bell-Hole" positions (positions 5G and 6G) with shielded metal arc welding (SMAW), "TIG" welding (GTAW) and "MIC" (GMAW) welding. Plasma arc cutting.

Prerequisite: WLD 138 and WLD 139, or WLD 236 and WLD 237.

Related Arts Department

Department Head: Joe I. Juarez Beeson Technical Arts Building

Business Data Processing

The objective of this course of study is to prepare the student for a career in computer programming within the field of business data processing. Students learn to write programs in different programming languages to solve a variety of problems. Programs vary with the type of problems to be solved.

In hiring programmers, employers look for people who can think logically and are capable of exacting analytical work. The job also calls for patience, persistence, and the ability to work with extreme accuracy even under pressure. Ingenuity and imagination are particularly important when programmers must find new ways to solve a problem.

A graduate of this two-year instructional program is awarded the Associate of Applied Science degree.

Placement Test

A good Math background is necessary for a student to benefit fully from any of the languages taught in the Business Data Processing program. A placement test has been developed that will assist in placing a student in the beginning freshman courses.

All entering students are required to take the test before they can register for any of the language courses. It will be given during summer orientation and regular registration periods.

Recommended Program of Study

First Semester	Second Semester
BDP 131 Introduction to Tech Accounting..... 3:3:0	BDP 136 Technical Accounting..... 3:3:0
BDP 133 Introduction to Bus Data Proc..... 3:3:0	BDP 142 BASIC/FORTRAN I..... 4:3:2
BDP 144 COBOL I..... 4:3:2	BDP 241 COBOL II..... 4:3:2
BC 131 Basic Communications or Eng Comp (Eng Dept)..... 3:3:0	TM 1331 Algebra Trig..... 3:3:0
TM 134 Business Mathematics..... 3:3:0	BC 132 Business Communications or Eng Comp (Eng Dept)..... 3:3:0
<u>16:15:2</u>	<u>17:15:4</u>
Third Semester	Fourth Semester
BDP 230 Advanced Tech Accounting..... 3:3:0	BDP 233 Tech Cost Accounting..... 3:3:0
BDP 231 System Design..... 3:3:0	BDP 243 FORTRAN II or BDP 246 Basic II..... 4:3:2
BDP 244 COBOL Applications..... 4:3:2	BDP 245 RPG..... 4:3:2
BDP 247 Assembly Language..... 4:3:2	Electives..... 6:6:0
MM 131 Survey of Business..... 3:3:0	
<u>17:15:4</u>	<u>17:15:2</u>

*By Approval

Suggested Electives: MM 132, 134, 135, 133, 138, 231; BC 231; Psy 131; Soc 131; Spc 131; OA 121, 122; Eco 131, 132.

Business Data Processing Courses (BDP)

131	Introduction to Technical Accounting	3:3:0
	Double-entry accounting practices and procedures applied to special journals, working papers, subsidiary records and preparation of financial statements for a sole proprietorship with an introduction to partnerships.	
133	Introduction to Business Data Processing	3:3:0
	A survey of data processing from its beginning. Introduction to internal data representation, file concepts, record layouts and an overview of programming languages to be encountered in later courses.	
136	Technical Accounting	3:3:0
	A continuation of accounting principles begun in BDP 131. <i>Prerequisite: BDP 131.</i>	
142	BASIC/FORTRAN	4:3:2
	A study of the BASIC programming languages and introduction to FORTRAN. Progressive techniques are developed through programming, definition, flow charting, coding, documentation, and execution. <i>Prerequisite: Placement test.</i>	

- 144 **COBOL I** 4:3:2
A study of the COBOL programming language. Progressive techniques are developed through program definition, flow charting, coding, documentation and program execution.
Prerequisite: Placement test.
- 231 **System Design** 3:3:0
Fundamentals of system design analysis and documentation. Problems in designing, analyzing, changing and existing system, and implementation.
- 230 **Advanced Tech Accounting**
A continuation of accounting principles that were begun in BDP 131 and BDP 136.
- 245 **RPG** 4:3:2
A study of the RPG language. Progressive techniques are developed through problem definition. Flowcharting and coding.
Prerequisite: BDP 142 or consent of the instructor.
- 233 **Principles of Technical Cost Accounting** 3:3:0
Accounting for material, labor and overhead under job cost, process cost and standard cost systems.
Prerequisite: BDP 136 or consent of the instructor.
- 241 **COBOL II** 4:3:2
A continuation of BDP 144 with emphasis on table handling and disk file processing.
Prerequisite: BDP 144.
- 243 **FORTRAN II** 4:3:2
The application of FORTRAN to business and numerical problems.
Prerequisite: BDP 142.
- 244 **COBOL Applications** 4:3:2
Defining problems for business application and programming the solutions using primarily the COBOL Language.
Prerequisite: BDP 241.
- 246 **Basic II**
The course is to further the programming skills of students who have completed BDP 142 and who have chosen the Basic Language as an alternative to FORTRAN for advanced study.
- 247 **Assembly Language** 4:3:2
An introduction to the GMAP (Honeywell) language using computer registers, opcode interpretation/execution and assembled program structure.
Prerequisite: BDP 142 or BDP 144.

Industrial Supervision

Industrial supervision was approved in 1981 as an Associate of Applied Science degree program after being offered for several years as a certificate program. The purpose of the program is to prepare supervisors for industry. The program contains courses needed by foremen, group leaders, superintendents, and others who directly supervise workers in industry. The emphasis is on industrial as opposed to business.

After successful completion of the program of study, a student is awarded an Associate of Applied Science degree.

A person who successfully completes 24 semester hours is eligible to receive a Certificate of Completion in Industrial Supervision.

Recommended Program of Study

First Semester	Second Semester
MM 131 Survey of Business..... 3:3:0	IS 1315 Cost Reduction..... 3:3:0
MM 132 Free Enterprise System I..... 3:3:0	BC 132 Business Communications..... 3:3:0
*BC 131 Basic Communications..... 3:3:0	TM 134 Business Mathematics..... 3:3:0
TM 131 Fundamental Mathematics I..... 3:3:0	BDP 131 Introduction to Tech Accounting..... 3:3:0
*IS 1312 Applied Supervision..... 3:3:0	OSH 131 Introduction to Occupational Safety & Health..... 3:3:0
15:15:0	18:12:14
Third Semester	Fourth Semester
*IS 1313 Critical Path Scheduling..... 3:3:0	MM 238 Legal Aspects of Business..... 3:3:0
Soc 131 Introduction to Sociology..... 3:3:0	*IS 1322 Labor Relations and Legislation..... 3:3:0
IS 1325 Industrial Communication I..... 3:3:0	Spc 131 Public Speaking..... 3:3:0
*MM 232 Human Resources Management..... 3:3:0	IS 235 Training and Developing Workforce..... 3:3:0
**Electives (6 hours)..... 6:6:0	IS 231 Time and Motion Studies..... 3:3:0
18:18:0	18:18:0

*Required for Certificate of Completion
 **By Approval
 Electives: BDP 136; IS 1317, 1318, 1319, 1326; OSH 132, 134; MM 134, 231.

Industrial Supervision Courses (IS)

1312	Applied Supervision	3:3:0
	A study of methods of applying psychology to the handling of people; the use of testing methods, consideration of such factors as morale, group attitudes, motivation, frustration and fatigue; and application of psychological studies to human behavior on the job.	
1313	Critical Path Scheduling	3:3:0
	A study of the mechanics of the CPM and PERT method and their specific applications to business and industry. How to introduce CPM into a company and set up the procedures necessary to adapt it to various types of organizations.	
1315	Cost Reduction	3:3:0
	Methods of carrying out a comprehensive continuing cost reduction and control program including how to get all levels of supervisory management to participate in the cost reduction effort and to include cost control as an integral part of the supervisor's total job.	
1317	Construction Materials	3:3:0
	An in-depth study of the nature, origin, properties and use of construction materials. All types of materials used in construction will be covered with particular emphasis on their physical characteristics.	
1318	Construction Methods and Equipment	3:3:0
	The analysis of up-to-date construction techniques with emphasis upon understanding the organization and equipment used in excavating; pile driving; and concrete, wood, brick, stone and steel construction.	
1319	Construction Management	3:3:0
	An introductory course covering the total responsibilities of a construction manager, project manager and construction supervisor.	
1322	Labor Relations and Legislation	3:3:0
	Company policy, labor history, legislation and labor unions, the labor contract, grievances and arbitration are included in this course.	
1325	Industrial Communications I	3:3:0
	Basic information and techniques for effectively communicating with employees, management, customers and the public. Some of the topics covered in the course are logical and creative thinking, making a speech, dictating, and telephoning.	
1326	Industrial Communications II	3:3:0
	Basic information and techniques for effectively communicating with employees, management, customers and the public through letter and report writing.	
231	Time and Motion Studies	3:3:0
	This course is designed to acquaint the industrial supervisor with the techniques of improving productivity through more productive practices.	
235	Training and Developing Workforce	3:3:0
	Preparing the first line supervisor for the tasks of training and developing workers. Philosophy and techniques are emphasized.	

Mid-Management

Mid-Management is a program in business and supervisory management designed to develop the fundamental skills, knowledge, attitudes and experience which will enable men and women to function in decision-making positions as supervisors or managers. All new students must be counseled by a mid-management coordinator before registering. This program is offered at the Beaumont, Port Arthur and Orange campuses.

A graduate of this two-year instructional program is awarded the Associate of Applied Science degree.

Recommended Program of Study

First Semester		Second Semester	
MM 131 Survey of Business.....	3:3:0	MM 135 Free Enterprise System II.....	3:3:0
MM 132 Free Enterprise System I.....	3:3:0	BC 132 Business Communications or	
BC 131 Basic Communications or		English Composition.....	3:3:0
English Composition.....	3:3:0	TM 134 Business Mathematics.....	3:3:0
TM 131 Fundamental Mathematics I or		MM 138 Fundamentals of Supervision &	
Mth 1313 (Math Dept).....	3:3:0	Leadership.....	3:3:0
BDP 133 Introduction to Business Data Proc.....	3:3:0	BDP 131 Introduction to Technical Accounting.....	3:3:0
		*Elective (3 hours).....	3:3:0
	15:15:0		18:18:0

Third Semester		Fourth Semester	
MM 231 Small Business Management	3:3:0	IS 1322 Labor Relations & Legislation	3:3:0
MM 2311 Internship Seminar	3:1:15	MM 2312 Internship Seminar	3:1:15
BDP 136 Technical Accounting	3:3:0	Spc 131 Public Speaking	3:3:0
Soc 131 Introduction to Sociology	3:3:0	MM/238 Legal Aspects of Business	3:3:0
MM 232 Human Resources Management	3:3:0	*Elective (3 hours)	3:3:0
*Elective (3 hours)	3:3:0		
18:16:15		15:13:15	

*By approval
 Suggested Electives: BDP 230, BDP 142, 144; BC 231; MM 133, 134, 237; REs 1311, 1312, 1313, 1314, 2315, 2316; BA 331, 332, 3301; IS 1313, 1315; OSH 131.

Mid-Management Courses (MM)

- 131 **Survey of Business** 3:3:0
 Survey of the functional areas of business and their interrelationships. Economics of industry and business; ownership and organization; marketing; production; personnel; finance and business controls.
- 2311, 2312 **Internship Seminar** 3:1:15
 This course includes a one-hour seminar designed to build or strengthen a specific management skill. A requisite for this course is that the enrolled student must have at least 15 hours per week of approved supervised employment toward his/her career plan.
- 132 **Free Enterprise System I** 3:3:0
 A basic introduction to macroeconomics for the vocational student.
- 133 **Principles of Selling** 3:3:0
 Precepts of effective selling in the American economy. Sales process; prospecting; presentation; objections; and closing.
- 134 **Personal Money Management** 3:3:0
 Advice on how to make the student a better money manager in personal and family affairs. This includes budgets, purchases, taxes, savings, insurance, Social Security, investments, wills and estates.
- 135 **Free Enterprise System II** 3:3:0
 A practical application of the free enterprise system to the individual and his business. A basic introduction to microeconomics for the vocational student.
- 138 **Fundamentals of Supervision and Leadership** 3:3:0
 Methods and techniques of supervision; included are basic skills for beginning supervisors. Topics included are new employees, interviewing, job methods training, safety, grievances, motivation, and discipline.
- 231 **Small Business Management** 3:3:0
 A practical view of the problems of initiating and operating a small business. Should clarify some questions of career choice and decision-making in business.
- 232 **Human Resources Management** 3:3:0
 An elementary and practical approach to the problems with employees as individuals and groups, including those represented by unions.
- 237 **Retailing** 3:3:0
 The development, organization, methods, policies of operation and problems in the marketing structure.
- 238 **Legal Aspects of Business** 3:3:0
 An introductory course in contracts, warranties, agency, and property law.

Basic Communications, Technical Mathematics and Job Relations

These courses are designed to relate to and complement the various programs offered in the College of Technical Arts. The objectives are to develop student competence in the areas of reading, applied grammar and public speaking; to develop student competence in applied mathematics and to develop student understanding of job and human relations.

Basic Communications Courses (BC)

- 131 **Basic Communications** 3:3:0
 The objectives of this course are to develop student competence in speaking and writing and to increase student competence in the use of the library for research in his major field.

- 132 Business Communications** 3:3:0
The preparation of specifications, inventories, orders for supplies, tools and equipment and the basic elements of business letters and report writing through the use of practice letters and case studies.
- 231 Technical Writing** 3:3:0
A study of the techniques of technical writing and its application to the individual student's major field.
Prerequisite: Students must have taken BC 131 and 132 or its academic equivalent.

Job Relations Courses (JR)

- 231 Job Relations** 3:3:0
The purpose of this course is to present and analyze the roles of the worker and management. Included in the course will be a presentation of labor-management relations, evolution and growth of the American labor movement, development and structure of American business, communicative channels, state and federal legislation that affects the worker and management and personnel problems encountered in association with employers and employees.
- 232 Human Relations** 3:3:0
The purpose of this course is to survey the social sciences that help explain human behavior and motivation. This course will include such topics as maturation, deviant behavior, cultural and social problems and interpersonal relationships in the job situation. These topics are designed to help individuals better understand themselves and society.

Mathematics Courses (TM)

- 131 Fundamentals of Mathematics I** 3:3:0
Review and application of the fundamentals of mathematics; fractions, decimals, ratio and proportion, weights and measures, metric system, introduction to algebra.
- 132 Fundamentals of Mathematics II** 3:3:0
Introduction to algebra, polynomials, exponents, powers and roots, solutions of simple equations, introduction to trigonometry and logarithms.
Prerequisite: TM 131 or the equivalent.
- 134 Business Mathematics** 3:3:0
A comprehensive course in basic business mathematics. Presenting work in interest, payrolls, taxes, financial statements and special problems for the mid-manager.
Prerequisite: TM 131 or the equivalent.
- 135 Fundamentals of Metric Measure for the Craftsman** 3:3:0
An introduction to the "Think Metric" approach of learning the International System of Measurement. Presentation of units on prefixes, length, volume, mass, area and temperature.
- 1331 Algebra Trigonometry** 3:3:0
A study of basic algebraic and trigonometric techniques needed by a technician. Includes simultaneous equations, logarithms, solutions of triangles, radian measure and complex numbers.
- 231 Applied Geometry** 3:3:0
Introduction to geometry, areas of polygons, triangles, circles, prisms, cylinders, pyramids, cones, frustrums, spheres and special solids.
Prerequisite: TM 132 or the equivalent.
- 232 Industrial Mathematics** 3:3:0
Introduction to trigonometry; strength of materials; work and power problems; speed ratios and pulleys and gears.
Prerequisite: TM 231.

Property Tax Administration

The objectives of the Property Tax Administration program are the following: to provide knowledge and ability to property appraisal procedures; to be an effective training for professional advancement in property valuation and assessment administration; and, to serve as a basis for certification of personnel in the appraisal field.

Upon completion of this two-year program of study, the student is awarded an Associate of Applied Science degree.

Recommended Program of Study

First Semester	Second Semester
English Composition 3:3:0	English Composition 3:3:0
TM 134 Business Mathematics 3:3:0	PTA 131 Tax Office Administration 3:3:0
PM 1333 Construction Estimating 3:3:0	PTA 132 Ad Valorem Tax Law 3:3:0
RES 1311 Real Estate Principles & Practices 3:3:0	RES 1313 Real Estate Appraising 3:3:0
Elective 3:3:0	Elective 3:3:0
15:15:0	15:15:0

Third Semester		Fourth Semester	
RES 2313 Advanced Appraising.....	3:3:0	PTA 231 Mass Property Appraisal.....	3:3:0
BDP 133 Introduction to Data Processing.....	3:3:0	PTA 232 Tax Collection and Procedures.....	3:3:0
PTA 133 Assessment Administration and Procedures.....	3:3:0	PTA 233 Problems in Taxation.....	3:3:0
PTA 134 Personal Property Appraisal.....	3:3:0	PTA 261 Internship.....	6:2:30
Elective.....	3:3:0		
	<u>15:15:0</u>		<u>15:11:30</u>

Suggested Electives: Eco 131, Spc 131, Psy 131, His 231, Dft 133, BDP 131, Gov 2331, MM 231, RES 1314

Course Description (PTA)

131 Tax Office Administration	3:3:0
A study of principles, practices, and methods utilized in tax offices.	
132 Ad Valorem Tax Law	3:3:0
A study of Texas laws and regulation on property tax.	
133 Assessment Administration and Procedures	3:3:0
Assessment administration and techniques involved in the assessment process.	
134 Personal Property Appraisal	3:3:0
A study in the methods and techniques of appraising all types of personal property.	
231 Mass Property Appraisal	3:3:0
A study of the methods and application of appraising large numbers of property in a minimum time.	
232 Tax Collection and Procedures	3:3:0
A study of the procedures of collection and legal remedies.	
233 Problems in Tax	3:3:0
A study of types of problems and solutions to be encountered in the tax field.	
261 Internship	6:2:3
An on-the-job learning experience to allow students to apply skills, education, and abilities.	
2312 Advanced Appraising	3:3:0
This course is an advanced study of market, cost, and income approaches to value for residential and commercial property.	

Real Estate

The program of study is designed to prepare a student to enter the real estate industry in the fields of real estate sales, appraising, brokerage, finance, development, investment and management. It is planned for those entering the real estate industry, as well as for those who wish to expand their professional knowledge. These courses may be taken to satisfy the educational requirements of the Texas Real Estate Commission for salesman's licenses, renewals and broker's licenses.

Upon successful completion of 60 semester hours in the real estate degree program, a student is awarded an Associate of Applied Science degree in Real Estate.

After successful completion of 15 semester hours of real estate courses, a person is awarded a Certificate of Completion in Real Estate, upon request.

The real estate program is offered at the Beaumont, Orange and Port Arthur Campuses.

Recommended Program of Study

First Semester		Second Semester	
English Composition.....	3:3:0	English Composition.....	3:3:0
Mathematics.....	3:3:0	Mathematics.....	3:3:0
MM 132 Free Enterprise System I.....	3:3:0	BDP 131 Introduction to Technical Accounting.....	3:3:0
REs 1311 Real Estate Prin and Prac.....	3:3:0	REs 1312 Real Estate Finance.....	3:3:0
REs 1319 Real Estate Marketing.....	3:3:0	REs 1313 Real Estate Appraising.....	3:3:0
	<u>15:15:0</u>		<u>15:15:0</u>
Third Semester		Fourth Semester	
Gov 231 American Government.....	3:3:0	Soc 131 Introduction to Sociology or	
Spc 131 Public Speaking.....	3:3:0	JR 232 Human Relations.....	3:3:0
MM 231 Small Business Management.....	3:3:0	REs 2315 Real Estate Development.....	3:3:0
REs 1314 Real Estate Law.....	3:3:0	REs 2316 Real Estate Invest and Management.....	3:3:0
REs 2318 Real Estate Brokerage.....	3:3:0	REs 2317 Real Estate Current Trends and Problems.....	3:3:0
	<u>15:15:0</u>	Approved Elective.....	3:3:0
			<u>15:15:0</u>

Suggested electives: Eco 131, 132; Acc 231, 232; REs 1301; MM 131, 134; BDP 133, 136.

Real Estate Courses (REs)

- 1311 **Principles and Practices** 3:3:0
This is a study of the basic concepts and characteristics of real estate. It includes specialized areas such as real estate financing, investment, management, development, planning and property appraising.
- 1312 **Real Estate Finance** 3:3:0
This course deals with the finance involved in the real estate transaction, including the economic basis for mortgage financing, second mortgage and individual versus group or corporate financing.
Prerequisite: REs 1311.
- 1313 **Real Estate Appraising** 3:3:0
Methods of appraising real property from the income approach to value through residual techniques will be covered in this study.
Prerequisite: REs 1311.
- 1314 **Real Estate Law** 3:3:0
Law as it relates to real estate activities, including contract law, the law of agency and a study of legal characteristics influencing the capacity of real estate to produce a flow of services and income are topics explored in this course.
Prerequisite: REs 1311.
- 1319 **Real Estate Marketing** 3:3:0
Concepts for effective marketing of real estate through the sales process; prospecting, listing techniques, presentations, contracts, closings and basic objectives.
Prerequisite: REs 1311.
- 2315 **Real Estate Development** 3:3:0
This course is a study of the techniques and related areas of residential, industrial, recreational and marine (coastal) development, including certain ecological ramifications.
Prerequisite: REs 1311.
- 2316 **Real Estate Investment and Management** 3:3:0
This course is concerned with the analysis of real estate for investment decisions, including estimates of cash flow, impact of transaction and management of investment.
Prerequisite: REs 1311.
- 2317 **Real Estate Current Trends and Problems** 3:3:0
This course is designed to cover problems related to the practice of real estate.
Prerequisite: REs 1311.
- 2318 **Real Estate Brokerage** 3:3:0
This course consists of procedures to establish a real estate office; selling; securing and listing prospects; showing the property; financing the sale; legal factors of the transaction and closing the sale.
Prerequisite: REs 1311.
- 2312 **Real Estate Advanced Appraising** 3:3:0
This course is an advanced study of market, cost, and income approaches to value for residential and commercial property.
- 1301 **Real Estate Internship** 3:1:15
The student works with a real estate related business for 15 hours a week. The duties and activities are aimed at providing a training program for the student. Students, as a group, meet once a week with the instructor to analyze their work experience and relate it to their course in real estate.
Prerequisite: REs 1311.

Technical Department

Department Head: Dr. Jerry L. Wilson Beeson Technical Arts Building

Computer Electronics and Robotic Technology

Program Coordinator: William H. Mauer

High-technology technicians must be able to install, calibrate, troubleshoot, and repair microprocessors and/or computers and the many possible peripherals they may control. Therefore, Computer Electronics and Robotic Technology (CRT) majors must understand basic electricity and mechanics, digital electronics, and electro-mechanical/hydraulic/pneumatic devices.

These majors receive extensive instruction in computer and robot systems. They also receive 140 clock hours each semester of hands-on laboratory time for maximum manipulative skill development and operation competence with test equipment; digital microprocessor and computer circuits and components; disc and tape drive, plotter, and printer mechanics; and electro-mechanical, hydraulic and pneumatic robot design theory of operation, and maintenance techniques.

The quality and variety of skill and the intensity of instruction required of computer and robot technicians is high. Thus, the academic standard required of CRT majors is high. A graduate of this two year program is awarded the Associate of Applied Science degree.

Recommended Program of Study

To enroll in this program a student must:

- (a) have earned credit or equivalent credit in IET 131, IET 132, IET 136, IET 137, and TM 1331 with a grade of C or better; or
- (b) successfully challenge the above listed courses.

First Semester	Second Semester
IET 134 Solid State Devices I..... 3:3:0	IET 231 Digital Logic I..... 3:3:0
IET 1341 Introduction to Digital Logic..... 3:3:0	IET 232 Digital Logic II..... 3:3:0
IET 135 Solid State Devices II..... 3:3:0	IET 236 Digital Logic Laboratory I..... 3:0:6
IET 138 Solid State Lab I..... 3:0:6	IET 237 Digital Logic Laboratory II..... 3:0:6
IET 139 Solid State Lab II..... 3:0:6	BC 131 Basic Communications or
TM 1334 Electronic Mathematics or	Eng 131 (Eng. Dept.)..... 3:3:0
Math 1341 (Math Dept.)..... 3:3:0	CS 131 Computer Programming..... 3:3:0
18:12:12	18:12:12
Third Semester	Fourth Semester
IET 2331 Electronic Physics or	CRT 2331 Digital/Microprocessor Techniques..... 3:3:0
PHY 141 General Physics Mechanics and Heat..... 3:3:0	CRT 2341 Computer/Robotic Systems I..... 3:3:0
(Physics Dept)	CRT 2351 Computer/Robotic Systems II..... 3:3:0
IET 234 Microprocessor Theory I..... 3:3:0	CRT 2381 Computer/Robotic Laboratory I..... 3:0:6
IET 235 Microprocessor Theory II..... 3:3:0	CRT 2391 Computer/Robotic Laboratory II..... 3:0:6
IET 238 Microprocessor Laboratory I..... 3:0:6	Elective..... 3:3:0
IET 239 Microprocessor Laboratory II..... 3:0:6	
BC 132 Business Communications or	
Eng 132 (Eng. Dept.)..... 3:3:0	
18:12:12	18:12:12

Elective requires departmental approval:

Computer Electronics and Robotic Technology Courses (CRT)

The courses listed above with the IET prefix are described under the Industrial Electronics Technology program. All course work shown above must be completed with a grade of C or better. Any CRT major not earning a grade of C or better in attempted CRT degree plan course work will be required to repeat and complete the course(s) with a grade of C or better before continuing to take courses as a CRT major.

2331 Digital/Microprocessor Applications 3:3:0
 An investigation into various combinations of basic digital and microprocessor circuits for complex applications.
Prerequisite: IET 239 with a grade of C or better.

- 2341 Computer/Robotic Systems I** 3:3:0
Basic theory of positioning mechanisms and positioning techniques including pneumatic, electromechanical and hydraulic systems. Types of measurements and sensors as-related to positioning techniques. Theory of computer systems including basic interfacing and control techniques for various types of peripherals.
Prerequisite: IET 235 with a grade of C or better.
- 2351 Computer/Robotic Systems II** 3:3:0
In depth studies of systems including continuous closed loop applications; detailed analysis of robotics including hardware and software requirements; and detailed theory of computer systems interfacing, both hardware and software requirements, as applied to various peripherals.
Prerequisite: CRT 2341 and 2381 with a grade of C or better or taken concurrently.
- 2381 Computer/Robotic Laboratory I** 3:0:6
Applications of basic mechanisms and devices for positioning techniques. Introduction to sensors and familiarization with computer systems operation using a basic set of peripherals. Must be taken concurrently with CRT 2341 or 2341 is prerequisite.
Prerequisite: IET 239 with a grade of C or better.
- 2391 Computer/Robotic Laboratory II** 3:0:6
Advanced "hands-on" manipulation and maintenance of a computer system and hydraulic robot. Software development for manipulations and diagnostic techniques. Procedures and actual practice in electro-mechanical maintenance of computer and robotic hardware. Must be taken concurrently with CRT 2351 or 2351 is prerequisite.
Prerequisite: CRT 2381 with a grade of C or better or taken concurrently.

Drafting Technology

Program Coordinator: Ralph K. Mock

The two-year drafting program offered by the College of Technical Arts is designed to provide basic technical information required for entry into the occupation of conventional or computer aided drafting. Drafters prepare precise drawings and specifications from sketches, field notes and other information furnished by an engineer or designer. They also calculate the strength, quality, quantity, and cost of materials. Final drawings either by use of conventional drafting procedures or by computer, contain a detailed view of the object as well as specifications for materials to be used, procedures to be followed, and other information to carry out the job. Upon graduation drafters may specialize in a particular field of work, such as mechanical, electrical, electronic, aeronautical, structural, pipe, or architectural drafting.

Anyone planning a career in drafting should be able to do detailed work requiring a high degree of accuracy; have good eyesight and eye-hand coordination; and be able to function as part of a team since they work directly with engineers, architects, and skilled workers. Artistic ability is helpful in some specialized fields. A graduate of this two-year program is awarded the Associate of Applied Science degree.

Recommended Program of Study

First Semester	Second Semester
131 Drafting Instruments..... 3:3:0	134 Civil-Arch Drafting..... 3:3:0
132 Fund of Drafting..... 3:3:0	135 Civil-Arch Techniques..... 3:3:0
136 Basic Drafting Lab I..... 3:0:6	138 Civil-Arch Lab I..... 3:0:6
137 Basic Drafting Lab II..... 3:0:6	139 Civil-Arch Lab II..... 3:0:6
BC 131 Basic Communications or Eng 131 (Eng Dept)..... 3:3:0	BC 132 Business Communications or Eng 132 (Eng Dept)..... 3:3:0
TM 131 Fundamentals of Math I or Math 1334 (Math Dept)..... 3:3:0	TM 1331 Algebra-Trigonometry or Math 1341 (Math Dept)..... 3:3:0
<u>18:12:12</u>	<u>18:12:12</u>
Third Semester	Fourth Semester
231 A.S.M. Standards, Pipe and Fitting Designs..... 3:3:0	234 A.I.S.C. Specifications and Standards..... 3:3:0
232 Process Pipe Drafting..... 3:3:0	235 Structural Design..... 3:3:0
236 Systems Drafting Lab I..... 3:0:6	238 Structural Design Lab I..... 3:0:6
237 Systems Drafting Lab II..... 3:0:6	239 Structural Design Lab II..... 3:0:6
2301 Intro to Computer Aided Drafting..... 3:3:0	2331 Computer Aided Drafting Procedures..... 3:3:0
JR 231 Job Relations or CS 131 (Computer Science Dept.) or Approved Soc (Soc Dept)..... 3:3:0	Elective..... 3:3:0
<u>18:12:12</u>	<u>18:12:12</u>

Suggested Technical Arts electives: DFT 261; MM 131, 132, 134, 135, 231; BC 231; MT 133; TM 231. Other electives by departmental approval only.

Drafting Technology Courses (Dft)

- 131 Drafting Instruments** 3:3:0
 The proper use of all drafting instruments, the construction of freehand and mechanical lettering, dimensioning, multiview projection and geometrical construction. TM 131 (or equivalent) to be taken concurrently.
- 132 Fundamentals of Drafting** 3:3:0
 Instruments and materials of the professional draftsman. The course will include geometric construction, orthographic projections, sections, conventions, various methods of pictorial drawing and other technology as required in the profession.
Prerequisite: 131.
- 133 Introduction to Drafting** 3:1:4
 A course designed to develop illustrative and graphic communication skills; with emphasis on presenting information effectively by using diagrams, drawings, prints, sketches, graphs and charts drawn freehand and employing commonly available drawing aids such as straight edges, squared and graph paper and similar aids.
- 134 Civil-Architectural Drafting** 3:3:0
 This course covers the drafting techniques and theory of design for floor plans, schedules, elevations, site plans, foundations, electrical plans and schematics, sectional views, and surveying.
Prerequisite: 131 and 132. TM 1331 (or equivalent) to be taken concurrently.
- 135 Civil-Architectural Drafting Techniques** 3:3:0
 This course introduces terminology and techniques related to building construction estimating. It also introduces structural steel shapes, loading conditions, and conditions of static equilibrium.
Prerequisite: 131 and 132.
- 136 Basic Drafting Laboratory I** 3:0:6
 This is the first in a series of four courses in the use of drafting instruments, freehand and mechanical lettering, conventional signs and symbols, orthographic projection and pictorial drawing. This is a comprehensive laboratory course in basic drafting procedures and skills and is planned as a preparation for the three succeeding courses which will provide practice in the skills required in specialized types of drafting. 131 to be taken concurrently.
- 137 Basic Drafting Laboratory II** 3:0:6
 This course is a continuation of 136. 132 to be taken concurrently.
Prerequisite: 136.
- 138 Civil-Architectural Drafting Laboratory I** 3:0:6
 Drafting of plans for construction in wood, metal, or masonry including: foundation, floor, and electrical plans; window, door and room finish schedules; and elevations. It also includes miscellaneous electrical schematics and surveying problems.
Prerequisite: 136 and 137.
- 139 Civil-Architectural Drafting Laboratory II** 3:0:6
 This is a continuation of 138. 134 is to be taken concurrently.
Prerequisite: 136 and 137.
- 1311 Blueprint Reading** 3:3:0
 A study of lines, views, symbols and dimensions involved in reading blueprint and shop sketches. Practice in making freehand sketches of simple objects.
- 1331 Electrical and Electronics Drawing** 3:0:6
 This course is designed to enhance the background of the electrical-electronics student as well as the professional draftsman, by treating the main areas of the electrical industry, such as electronics, automation, microelectronics, electric power and architectural wiring.
- 230 Smoley's Tables** 3:0:3
 Introduction and applications of Smoley's Tables.
Prerequisite: TM 1331 or equivalent.
- 2301 Introduction to Computer Aided Drafting** 3:0:3
 Introduction to nomenclature, basic software and hardware utilized in computer aided drafting.
Prerequisite: 132 and 137.
- 231 ASM Standards, Pipe and Fitting Designs** 3:3:0
 A study of pipe and fittings, designs, symbols and specifications, sizing process lines and process symbols. Drafting of flow diagrams, vessels, heat exchangers, pumps, instruments, compressors and mechanical equipment.
Prerequisite: 132 and TM 1331 (or equivalent).

- 232 Process Pipe Drafting** 3:3:0
Process pipe drafting covering nomenclature, plans, elevations, details and process equipment.
Prerequisite: 231 and 230. 230 may be taken concurrently.
- 233 Drafting Design Procedures** 3:3:0
The solutions of essential miscellaneous elements in the design and drawing of problems in the electrical, architectural, piping, structural and other types of drafting by the use of Smoley's Tables and the calculator.
Prerequisite: 230 or approval of instructor.
- 2331 Computer Aided Drafting Procedures** 3:0:3
Drafting and design problems involving piping, architectural, structural, and electrical drawings utilizing computer aided drafting procedures.
Prerequisite: 2301.
- 234 AISC Specifications and Standards** 3:3:0
AISC specifications and standards, basic strength of materials, structural theory and data. Detailing structure members and connections.
Prerequisite: 132 and 135 or 232.
- 235 Structural Design** 3:3:0
Structural steel, completion of column details, brace details, skewed connections, moment connections, seated connections, erection drawings, stair and miscellaneous details. Design using AISC standards of beams and columns working with kip loads.
Prerequisite: 234.
- 2351 Theoretical Application of Computer Aided Drafting to Structural Steel** 3:0:3
Drafting detail and procedures involving, but not limited to, columns, braces, skewed connections, moment connections, seated connections, beams, stairs, and ladders utilizing computer aided drafting techniques.
Prerequisite: 2331 and 234 or taken concurrently.
- 236 Systems Drafting Laboratory I** 3:0:6
A study of pipe and fittings, designs, symbols and specifications, sizing process lines and process symbols. Drafting of flow diagram, vessels, heat exchangers, pumps, instruments, compressors and mechanical equipment. 231 to be taken concurrently.
Prerequisite: 137.
- 237 Systems Drafting Laboratory II** 3:0:6
This course is a continuation of 236. 232 to be taken concurrently.
Prerequisite: 236.
- 238 Structural Design Laboratory I** 3:0:6
Drafting of plans, sections and details and AISC specifications for industrial structures which will include structural steel, pipe and concrete reinforcing rods. 234 to be taken concurrently.
Prerequisite: 137 and 139 or 237.
- 239 Structural Design Laboratory II** 3:0:6
This course is a continuation of 238. 235 to be taken concurrently.
Prerequisite: 238.
- 2391 Computer Aided Structural Design Laboratory** 3:0:6
Plans, sections, details and AISC specifications for industrial structures are examined in detail utilizing computer aided drafting techniques.
Prerequisite: 2351 or 2351 taken concurrently.
- 261 Design Project Seminar** 6:1:10
This course is designed to stimulate and develop the design drawing skills of the student. The course will include one major design project which includes a scale model and complete set of working drawings, selected by the student and approved by the instructor.
Prerequisite: Consent of the instructor.

Industrial Electronics Technology

Program Coordinator: William H. Mauer

Electronic technicians are faced with a veritable maze of semiconductor and microprocessor devices and a multitude of new and diverse circuits which utilize them. These devices and their applications increase continually as industrial, government, and academic research and development laboratories push back the frontiers of knowledge in pure and applied science and in technology. The technical manpower needed to help design, maintain, and repair the "new breed" of industrial electronics equipment that is currently available and in use is expected to triple during the next decade.

Learning about electronics requires that a person must acquire both technical knowledge and manual dexterity. Both are required in order to demonstrate an acceptable level of performance. Those who acquire basic electronic knowledge alone are of little value in industry if they cannot put it to use in the practical applications encountered in the real world. A truly technically trained individual must be able to do things with what he knows. The Industrial Electronics program offered by the College of Technical Arts teaches a person how to apply learned electronic knowledge to practical situations. A graduate of this two-year program is awarded the Associate of Applied Science degree.

Recommended Program of Study

First Semester	3:3:0	Second Semester	3:3:0
IET 131 DC Theory and Circuits	3:3:0	IET 1341 Introduction to Digital Logic	3:3:0
IET 132 AC Theory I	3:3:0	IET 134 Solid State Devices I	3:3:0
IET 136 DC Lab	3:0:6	IET 135 Solid State Devices II	3:0:6
IET 137 AC Lab	3:0:6	IET 138 Solid State Lab I	3:0:6
TM 1331 Algebra - Trigonometry or Math 1334 (Math Dept)	3:3:0	IET 139 Solid State Lab II	3:0:6
BC 131 Basic Communications or Eng 131 (Eng Dept)	3:3:0	TM 1334 Electronic Mathematics or Math 1341 (Math Dept)	3:3:0
	18:12:12		18:12:12
Third Semester	3:3:0	Fourth Semester	3:3:0
IET 231 Digital Logic I	3:3:0	IET 2331 Electronic Physics or Phy 141 General Physics-Mechanics and Heat (Physics Dept)	3:3:0
IET 232 Digital Logic II	3:3:0	IET 234 Microprocessor Theory I	3:3:0
IET 236 Digital Logic Lab I	3:3:0	IET 235 Microprocessor Theory II	3:0:6
IET 237 Digital Logic Lab II	3:0:6	IET 238 Microprocessor Lab I	3:0:6
BC 132 Business Communications or Eng 132 (Eng Dept)	3:3:0	IET 239 Microprocessor Lab II	3:3:0
CS 131 Computer Programming (Computer Science Dept)	3:3:0	Elective	3:3:0
	18:12:12		18:12:12

Suggested Technical Arts electives: DFT 133; MM 131, 132, 134, 135, 231, 232, BC 231, MT 133, Wld 133. Other electives by departmental approval only.

Industrial Electronics Technology Courses (IET)

- 131 DC Theory and Circuits** 3:3:0
Electron theory, Ohm's Law, power, simple series and parallel circuits, combined series/parallel circuits, and Kirchoff's laws. TM 1331 (or equivalent) to be taken concurrently.
- 132 AC Theory I** 3:3:0
Electromagnetism, generation and characteristics of alternating voltage and current, inductance, transformers; inductive reactance, capacitance, and capacitive reactance.
Prerequisite: IET 131.
- 133 Basic Electricity** 3:3:0
Introduction to the field of electricity and electronics.
- 134 Solid State Devices I** 3:3:0
The theory of CE-CB-CC transistor circuits. Oscillators and trouble shooting.
Prerequisite: IET 132 and TM 1331 (or equivalent).
- 1341 Introduction to Digital Logic** 3:3:0
Number systems; logic family characteristics; and boolean equations.
Prerequisite: IET 132 and 137.
- 135 Solid State Devices II** 3:3:0
The theory of audio and linear circuits. TTL basic logic. N and D, nor gates. Truth tables.
Prerequisite: IET 134.
- 136 DC Laboratory** 3:0:6
Basic electronic component and symbol familiarization, wiring techniques for DC series, parallel and combination circuits; voltmeter, ohmmeter and ammeter hookup and reading techniques; and DC power supply use and operation. IET 131 to be taken concurrently.
- 137 AC Laboratory** 3:0:6
Familiarization with TVM, oscilloscope and audio generator; experimentation and analysis of the characteristics of series and parallel inductance and capacitance and transformers. IET 132 to be taken concurrently.
Prerequisite: IET 136.

- 138 Solid State Laboratory I** 3:0:6
CE-CB-CC circuits; Audio and linear circuit oscillators. Transistor testing devices. IET 134 to be taken concurrently.
Prerequisite: IET 132.
- 139 Solid State Laboratory II** 3:0:6
Special transistors: FET; MOSFET; IGFET; etc. TTL basic circuits, N and D, nor gates. Visual-audio oscillators. IET 135 to be taken concurrently.
Prerequisite: IET 138.
- 230 Radio Telephone License Preparation** 3:3:0
A course designed to prepare the student to take the Federal Communications Commission test. It is oriented primarily toward two-way radio communication services. Elements I and II prepares for the third-class license; Elements III for the second-class license.
- 231 Digital Logic I** 3:3:0
The theory of TTL, including timers, readouts, OP AMPS, the use of Truth tables, and the binary number system.
Prerequisite: IET 135 and 1341.
- 232 Digital Logic II** 3:3:0
The theory and application to practical circuits using CMOS devices. Emphasis is placed on clocked circuits, flip-flops, shift registers, counters and OP-amplifiers.
Prerequisite: IET 231.
- 233 Transmitters and Receivers** 3:3:0
Principles of modulation and transmitter, transmitter circuits, principles of t-r-f and superheterodyne receiver circuits.
- 2331 Electronic Physics** 3:3:0
A basic study of light, sound and mechanics as they relate to the field of electronics.
Prerequisite: TM 1334 and IET 139.
- 234 Microprocessor Theory I** 3:3:0
Development of the computer, numbering systems, logic circuits, arithmetic logic.
Prerequisite: IET 237 and TM 1334 or equivalent.
- 235 Microprocessor Theory II** 3:3:0
Theory of memories, computer organization, computer peripherals, programming.
Prerequisite: IET 234 and 2331. IET 2331 may be taken concurrently.
- 236 Digital Logic Laboratory I** 3:0:6
Timers, registers, readouts, counters, OP Amps. IET 231 to be taken concurrently.
Prerequisite: IET 139.
- 237 Digital Logic Laboratory II** 3:0:6
Practical experiments with CMOS circuits. Clocked circuits, flip-flops, shift registers, counters, OP-amplifiers are examined in detail. IET 232 to be taken concurrently.
Prerequisite: IET 236.
- 238 Microprocessor Laboratory I** 3:0:6
Experiments with numbering systems, microcomputer basics, arithmetic, introduction to the microprocessor. IET 234 to be taken concurrently.
Prerequisite: IET 237.
- 239 Microprocessor Laboratory II** 3:0:6
Continued experiments with the MPU, interfacing, and programming. IET 235 to be taken concurrently.
Prerequisite: IET 238.

Lamar University at Orange

Lamar University began offering courses in Orange, Texas, in 1969 on an extension basis. In 1971, the Texas Legislature created Lamar University at Orange and the citizens of Orange provided facilities for the educational center. The campus became part of the Lamar University system in 1983. The facilities have been expanded with the acquisition of land formerly owned by the U.S. Navy. An extensive remodeling of the main building was completed in 1976 at a cost exceeding \$500,000.

Lamar University offers first and second year courses in the principal fields of the University in addition to complete programs in drafting technology, real estate, office occupations, technical accounting, industrial electronics, mid-management, industrial supervision, marine construction, welding and other career-oriented courses. Most courses are offered during the evening hours for the convenience of working students. For additional information, see the Lamar University at Orange bulletin.

Lamar University at Port Arthur

Port Arthur College merged with Lamar University in August 1975, with legislative funding of instructional programs at the first and second year level. Lamar University-Port Arthur courses are offered on the same basis as courses authorized for the university system in principal areas of business, education and liberal arts, as well as vocational and technical arts programs. Fields of study located only at the Port Arthur campus include automotive mechanics, auto body repair, electronics technology, cosmetology, drafting, welding, child care technology, word processing, real estate, general secretary, legal secretary and medical secretary.

For additional information, see the Lamar University at Port Arthur bulletin.

not required to provide

... ..

... ..

... ..

... ..

... ..

Academic Affairs

Graduation Requirements

Associate of Applied Science

Generally, students are eligible for graduation when they have completed an approved program of study. Specifically, a student must:

1. Satisfy all admission requirements.
2. Complete an approved degree plan.
3. Have at least a 2.0 grade point average on all courses attempted in the College of Technical Arts, at least a 2.0 grade point average on all courses used to meet degree requirements and at least a 2.0 grade point average on all courses in the major field. These grade point requirements must be met before applying for graduation.
4. Complete 24 semester hours of major work at Lamar with 12 hours in 200 level courses.
5. Make final application for graduation and pay all fees by the deadline date as stated in the current catalog.
6. Attend the official graduation exercise or receive prior approval from the Dean of Admissions and Registrar to be absent.

Diploma

1. Satisfy all admission requirements.
2. Complete an approved diploma plan.
3. Have at least a 2.0 grade point average on all work submitted on the diploma plan and at least a 2.0 on all courses in the major field submitted on the diploma plan.
4. Complete 18 semester hours of major work at Lamar.
5. Make final application for graduation and pay all fees by the deadline date as stated in the current bulletin.

Certificate of Completion

Generally, students are eligible for graduation when they have completed an approved program of study. Specifically, a student must:

1. Satisfy all admission requirements.
2. Complete an approved certificate plan.
3. Have at least a 2.0 grade point average on all work submitted on the certificate plan.
4. Make application for certification to the person responsible for the program.

Graduation Under a Particular Bulletin

A student normally is entitled to graduate under the degree provisions of the catalog in effect at the time of the first completed semester of enrollment with these exceptions:

A catalog more than seven years old shall not be used.

The program of the student who interrupts enrollment (for reasons other than involuntary military service) for more than one calendar year shall be governed by the catalog in effect at the time of the student's re-entrance to the University. The student who interrupts enrollment for involuntary military service must re-enroll within one year from the date of separation from military service in order for this provision to apply. For these purposes, enrollment shall be defined as registration for and successful completion of at least one course during an academic term. A student forced to withdraw for adequate cause before completion of a course may petition for a waiver of this provision at the time of withdrawal.

The program of the student who changes major from one department to another within the University shall be governed by the degree requirements in effect at the time the change of major becomes effective.

At the discretion of the dean, the student will be required to comply with all changes in the curriculum made subsequent to the year in which the student is enrolled. Deletions and additions of courses will be of approximately equal credit so that no student will have an overall appreciable increase of total credits required for graduation.

Any first-time college student who entered a junior college on or after September 1, 1968, can qualify, upon transfer to Lamar University, to graduate under the Lamar University catalog in effect when the student entered the junior college if the core curriculum provisions of the Coordinating Board are followed. Students are subject to the requirement that if they interrupt their studies for more than one calendar year at the junior college or before transfer to Lamar University, they must qualify for graduation under the catalog in effect when they return to the junior college or matriculate at Lamar University. This policy became effective for the year 1974-75.

Graduation With Honors

To be designated as honor graduates, members of the College of Technical Arts graduating class must (1) have completed at least 30 semester hours at Lamar University, (2) have a grade point average of at least 3.5 for all course work attempted at Lamar as well as a 3.5 on the combination of work at Lamar and all attempted work at other institutions attended. A grade point average of 3.5 to 3.64 qualifies for "honors," 3.65 to 3.79 for "high honors" and 3.80 to 4.00 for "highest honors."

Grades made the semester of graduation are included in the calculation of grade point averages for honors. Recognition of honor graduates at the commencement exercises, however, will of necessity be limited to those who have the qualifying grade point average at the end of the semester or term preceding graduation. Both diplomas and permanent records indicate graduation honors.

Academic Progress

Student Classification

Students are classified as freshmen, sophomores, juniors, seniors and post baccalaureate. For the purpose of determining eligibility to hold certain offices and for other reasons, officially enrolled students are classified as follows:

Freshman: has met all entrance requirements but has completed fewer than 30 semester hours.

Sophomore: has completed a minimum of 30 semester hours with 60 grade points.

Junior: has completed a minimum of 60 semester hours with 120 grade points.

Senior: has completed a minimum of 90 semester hours with 180 grade points.

Post baccalaureate: holds a bachelor's degree, but is not pursuing a degree program.

Grading System

A—Excellent	W—Withdrawn
B—Good	Q—Course was dropped
C—Satisfactory	S—Credit
D—Passing	U—Unsatisfactory; no credit
F—Failure	NG—No grade
I—Incomplete	

The grade of W or Q is given if the withdrawal or drop is made before the penalty date or if the student is passing at the time of withdrawal or drop.

The grade of I may be given when any requirement of the course, including the final examination, is not completed. Arrangements to complete deficiencies in a course should be made with the instructor.

Incomplete work must be finished during the next long semester, or the Office of Admissions and Records must change the I grade to the grade of F. The course must then be repeated if credit is desired.

An I grade also automatically becomes an F if the student reregisters for the course prior to removing the deficiencies and receiving a grade change.

The instructor may record the grade of F for a student who is absent from the final examination and is not passing the course.

Semester grades are filed with the Office of Admissions and Records. A grade may not be recorded for a student not officially enrolled in a course during the semester covered. A grade may not be corrected or changed without the written authorization of the instructor giving the grade. The written instruction for a grade change should be accompanied by a statement explaining the reason for the change.

Academic Appeals Procedures

After an enrollment lapse of seven or more years from Lamar University and after completing successfully (2.2 average) thirty semester hours of work at Lamar, a student may petition to disregard a maximum of two entire successive semesters of work taken previously at Lamar University. The petition shall be filed with the department head and shall follow regular channels to the vice president for academic affairs for a final decision. Endorsements and/or recommendations shall be required at each academic level. When approved by the vice president for academic affairs, disregarded work shall not count in determining the student's grade point average for academic progress or for graduation; however, it shall remain on the transcript with an appropriate notation, and it shall be used in determining honors.

Second Associate Degree

When another associate degree is taken simultaneously, or has been taken previously, the second associate degree may be granted upon the completion of all required work for the second degree. A total of 15 semester hours above the number required for the degree having the greater semester hours requirements must be completed.

Changing Schedules

All section changes, adds and drops must be approved by the department head of the student's major field. All such changes are initiated by the completion of the proper form available in the department head's office. Usually, a course may not be added after the first week of the semester or first two days of a Summer Session.

Dropping Courses

After consultation with their advisor and/or department head, students may drop a course and receive a grade of "Q" during the first six weeks (two weeks in the summer session) of the semester. For drops after this penalty-free period, grades are recorded as "Q" or "F" indicating that the student was passing or failing at the time of the drop. A grade of "Q" may not be assigned unless an official drop has been processed through the Office of Admissions and Records. A student may not drop a course within seven calendar days of the beginning of final examinations or three calendar days before the end of a summer term.

Withdrawals

Students wishing to withdraw during a semester or summer term should fill out a Withdrawal Petition in triplicate in the office of their department head. Students must clear all financial obligations and return all uniforms, books, laboratory equipment and other materials to the point of original issue. Three copies of the withdrawal form signed by the department head, the director of Library Services and an associate dean of Student Development are presented to the Office of Admissions and Records by the student.

The Finance Office, on application before the end of the semester or Summer Session, will return such fees as are returnable according to the schedule shown under the "Fees" section of the catalog. If a withdrawal is made before the end of the sixth week (second week of a summer term) or if the student is passing at the time of withdrawal after the sixth week, a grade of "W" is issued for each course affected. A grade of "F" is issued for all courses not being passed at the time of withdrawal after the penalty-free period.

A student may not withdraw within seven calendar days of the beginning of final examinations or three calendar days before the end of a summer term. A student who leaves without withdrawing officially will receive a grade of "F" in all courses and forfeit all returnable fees.

Enforced Withdrawal Due to Illness

The director of the Health Center and the vice-president for Student Affairs, on the advice of competent medical personnel, may require withdrawal or deny admission of a student for health reasons (mental or physical).

Grade Point Average Computation

The grade point average is a measure of the student's overall academic performance and is used in the determination of academic standing, rank in class, eligibility for graduation, etc.

In order to compute grade averages, grade points are assigned to letter grades as follows: to the grade A, 4 points; to B, 3 points; to C, 2 points; to D, 1 point, and to F, I, S, U, NG, W, 0 points. The number of grade points earned in a course is obtained by multiplying the number of semester hours credit by the number of points assigned to the grade made in the course.

The grade point average is calculated by dividing the total number of grade points earned by the total number of semester hours attempted in courses for which the grades A, B, C, D, F and I are assigned. Thus, for grades S, U, NG, W and Q, neither semester hours nor grade points are used in the computation of the grade point average. Hours attempted include all work taken whether passed, failed or repeated.

This method of calculating grade point averages will apply to all students in baccalaureate programs of study effective July 5, 1978. The University's former repeat policy will not apply to students in four year programs after this date; thus, the grade of a course repeated after July 5, 1978, may not be substituted for a prior grade.

Grade point averages for students in certificate, diploma and associate degree programs are calculated in the manner prescribed for baccalaureate programs, with one exception: A student in one of these programs who passes a course at the same institution where the student previously received a failing grade (F or U) will have only the passing grade and its associated grade points applied toward any certificate, diploma or associate degree. After the course is repeated, the student must file a request for a grade point adjustment with the Records Office. Any adjustment to a grade point average made during the time a student is enrolled in an applicable course of study is disregarded once the student enters a four-year program.

Final Grade Report

Reports on grades are mailed at the end of each semester or summer term. These reports include the semester grades and the grade point average for the semester, and for all work attempted at the University.

Scholastic Probation and Suspension

Students are expected to make acceptable scholastic progress toward their degree objectives. A "C" is the minimum satisfactory grade and a "C" average or 2.0 grade point average (GPA), constitutes satisfactory performance. Since two grade points are awarded for each semester hour of "C", students are in good standing if they have earned at least twice as many grade points as semester hours attempted. Students with a grade point deficiency shall be placed on scholastic probation and continued on probation as long as a deficiency exists.

All students with a grade point deficiency of 25 or more grade points at the end of the fall and spring semesters shall be suspended.

Students suspended from Fall and/or Spring Semesters by this action may, however, attend the Summer Session on probation. Students with a grade point deficiency less than 25 at the close of the Summer Session will be automatically reinstated and may register for the following Fall Semester.

Students with a grade point deficiency of 25 or more at the end of the Fall, Spring, or Summer Session must obtain approval for probationary re-enrollment from the dean of their respective college.

A college with approval of the Vice President for academic affairs, may prescribe academic requirements for its majors in addition to the basic university grade point standard. Students suspended under this provision may register in another college provided they meet the prescribed standards and are accepted through the normal change of major procedure. Students may not register for a 300 or 400 level course offered by the suspending college unless the course is required by their new curriculum.

Academic Records and Transcripts

Academic records are in the permanent custody of the Admissions and Records Office. Transcripts of academic records may be secured by an individual personally, or will be released on the student's written authorization. Also see Academic General Information, this bulletin.

Students who owe debts to the University may have their official transcripts withheld until the debt is paid.

Chapter 675, Acts of the 61st Legislature, 1969 Regular Session, provides that no person may buy, sell, create, duplicate, alter, give, or obtain a diploma, certificate, academic record, certificate of enrollment or other instrument which purports to signify merit, or achievement conferred by an institution of education in this state with the intent to use fraudulently such document or to allow the fraudulent use of such document.

"A person who violates this Act or who aids another in violating this Act is guilty of a misdemeanor and upon conviction, is punishable by a fine of not more than \$1,000 and/or confinement in the county jail for a period not to exceed one year."

Dean's List

At the end of each semester the Office of Admissions and Records prepares a list of all full-time (those who complete 12 or more semester hours) freshman and sophomore students who have earned for that semester a grade point average of 3.40 or above and junior and senior students who have earned for that semester a grade point average of 3.60 or above. This list is the Dean's List and is announced by the academic dean of each college.

Course Numbering

The unit of instruction for credit purposes is the course. Most courses meet three hours each week and have a credit value of three semester hours for one semester, or six hours for two semesters.

Each course has an individual alpha-numeric code (such as Eng 333). The alpha part indicates the subject area. Each number contains three or more figures. The first digit indicates the rank of the course: 1, means it is freshman level; 2, sophomore level; 3, junior level; and 4, senior level. The second figure indicates the number of semester hours credit. The third figure (or figures) indicate the order in which the course normally is taken. The letter a or b following course numbers indicates partial credit in each case; full credit for such numbered courses will be granted only when the series is complete.

Applied music courses are numbered so the second number indicates both semester hour credit and number of private lessons each week.

In this bulletin, each course title will be followed by three digits separated by colons such as (3:3:1). This code provides the following information. The first number is the semester hours of credit for the course. The second number is the class hours of lecture, recitation or seminar meetings per week. The third number is the required laboratory hours per week. The letter A indicates that the hours are Arranged, usually with the instructor of the course.

New Courses

In order to meet changing educational requirements, the University reserves the right to add any needed courses at any time without regard to the listing of such courses in the catalog. It is expected that a listing of these courses will appear in the next catalog issue.

The right to change numbers in order to indicate changes in semester hours also is reserved for the reasons above.

Semester Hour

The unit of measure for credit purposes is the semester hour. One hour of recitation or equivalent in laboratory work each week usually is equal to one semester hour. For each classroom hour, two hours of study are expected. Two or more hours of laboratory work are counted equivalent to one classroom hour. For laboratory work which requires reports to be written outside of class, two clock hours are usually counted as one semester hour.

Registration for Classes

Students will be permitted to attend class only when the instructor has received evidence of proper registration. Registration dates and deadlines are listed in the official University calendar. Students may add courses, make section changes or drop courses only within the period specified in the calendar. A schedule of classes is prepared by the Office of Admissions and Records well in advance of a given semester.

Minimum Class Enrollment

The University reserves the right not to offer any courses listed in this catalog if fewer than 12 students register for the course.

Evening Classes

Classes offered after 4:45 p.m. are considered Evening Classes. Both day and evening classes, with few exceptions, are taught by the regular faculty, and educational facilities are the same. Persons employed during the day may attend classes in the evening and study to obtain a degree or to expand their knowledge in a special field of interest as an adult non-degree student. Enrollment forms are available through the department of Off-Campus and Evening Programs, Room 101 Wimberly Student Affairs Building.

Auditing of Courses by Senior Citizens

Senior citizens, 65 years of age or older, may audit courses without the payment of fees on a space-available basis.

Class Attendance

Regular and punctual attendance in classes and laboratories is expected of all students. Instructors should maintain attendance records and adhere to attendance policies formulated by their departments.

In general, the individual instructor approves absences. Absences approved because of engagement in a university activity are published by the Admissions and Records Office. An approved absence allows the student to make-up examinations and written assignments without penalty. Although the student must make up the work missed, additional laboratory time is not granted the student.

All instructors should announce these policies concerning unexcused absences at the beginning of each semester.

Students who miss classwork to the extent that their laboratory performance may be unsafe or that they have no reasonable chance to pass the course may be dropped from that course by the department head. The department head should notify the student prior to this action. If this action is taken after the first six weeks of the semester, a grade of "F" may be recorded for the course. The student's major department will be notified that the student was dropped for the reason of excessive unexcused absences.

Overloads

The Dean of the College of Technical Arts must approve all overloads. In general, the student must demonstrate that he/she is capable of maintaining a high performance level in all classes.

Change of Address or Name

Students are responsible for all communications addressed to them at the address on file in the Student Affairs Office and in the Office of Admissions and Records. Any student who moves during a semester must immediately register his/her change of address in the

office of the dean of Student Development and in the office of Admissions and Records. Change of address forms are available in the Office of Admissions and Records.

Change of name due to marriage, or correction of name because of spelling errors may be made by completing a name change card at the Admissions and Records Office. All name changes must be accompanied by a copy of the legal document making the name change official. This document will be kept on file in the student's confidential folder.

Educational Records and Student Rights

The following information concerning student records maintained by Lamar University is published in compliance with the Family Education Rights and Privacy Act of 1974 (PL 93-380).

Access to educational records directly related to a student will be granted to him or her unless the type of record is exempted from the provision of the law.

The types, locations and names of custodians of educational records maintained by the University are available from the dean of Admissions and Records.

Access to records by persons other than the student will be limited to those persons and agencies specified in the statute. Records will be maintained of persons granted such access and the legitimate interest in each case.

The release of information to the public without the consent of the student will be limited to the categories of information which have been designated by the University as directory information and which will be routinely released. The student may request that any or all of this information be withheld from the public by making written request to the Admissions and Records Office. The request must be made by the last official day to register for a given session and applies to that session only. Directory information includes name; current and permanent address; telephone listing; date and place of birth; sex; marital status; country of citizenship; major and minor; semester hour load; classification; class schedule; eligibility for and participation in officially recognized activities and sports; weight and height of members of athletic teams; dates of attendance; degrees and awards received, with dates; previous educational agencies or institutions attended.

A student has the right to challenge records and information directly related to him or her if it is considered to be inaccurate, misleading or otherwise inappropriate. Issues may be resolved either through an informal hearing with the official immediately responsible or by requesting a formal hearing. The procedure to be followed in a formal hearing is available in the Office of Admissions and Records.

The right of parental access to student records may be established by either of two methods; first, by the student filing a written consent statement and second, by the parent validating the student's dependency as defined by IRS.

Student Affairs

Counseling and Testing Center

Lamar University maintains a Counseling and Testing Center to serve students encountering educational, social or personal difficulties as well as provide testing services. The center is staffed with a fully-trained and qualified psychologist and counselors and a psychometrist to assist in the resolution of student problems and questions.

While the Counseling Office does not address problems of a long-term therapeutic nature, students encountering difficulties are encouraged to consult the office on a no-charge basis. All contacts are maintained as confidential and there are no entries made in the student's records. In addition to counseling, the office maintains a library to assist students in making decisions concerning choices of majors and careers.

The Testing Office coordinates required testing by Lamar University and provides individual testing services which include the administration and interpretation of vocational interest, and personality tests as requested by the Counseling Center staff. The Testing Office also acts as a National Testing Center for programs such as the Graduate Record Examinations, Law School Admission Test, National Teacher Examinations, Graduate Management Admission Test, Scholastic Aptitude Test (SAT), American College Testing Program (ACT), College Level Examination Program (CLEP), General Educational Development (GED High School Equivalency Test) and numerous other tests. Information and application forms concerning these tests may be obtained from the Testing Office.

The Counseling and Testing Center is located in the Wimberly Student Affairs Building and observes the office hours of the University. A staff member is also available until 7 p.m. Monday through Wednesday for the benefit of students who are attending evening classes.

Health Center

The University maintains a Health Center for the use of students. 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 University physician or of nursing care.

It is not possible for the University to provide unlimited medical service. Special medicines, examinations, treatments, X-rays and laboratory tests are not furnished. No charge is made, however, for up to 10 days care each semester in the Health Center, except for meals.

All students pay a Health Service Fee of \$5 up to 5 semester hours then \$1 for each additional hour with a maximum of \$15 for each of the Fall and Spring semesters, and \$1 per semester hour with a maximum of \$10 for each of the Summer sessions. Vaccines, serums and gamma globulin will be given in the Health Center from 1:00 to 4:30 P.M. Monday through Friday, free of charge. Pre-admission vaccinations are not included. All drugs prescribed and dispensed in the Health Center are free of charge except for a limit of one prescription refill per illness or accident. The first \$100 of costs for emergency care of accidental injuries sustained on the campus and treated in a local hospital or doctor's office will be paid from student health fees. For services in the Health Center, each student must present his or her student services card.

The Health Center is located on East Virginia Street adjacent to tennis courts. The Health Center does not provide care for students requiring surgery or the services of specialists. In these cases, every effort will be made by the physician or nurse to refer to a doctor or facility for treatment; furthermore, every effort will be made to notify the parent or guardian of the student's needs.

The University assumes no responsibility for continued medical care for chronically ill or injured students. These students should arrange for the care of a private physician. When the University is not in session, the Student Health Center is not responsible for a student's health care.

The University is not under obligation to provide hospital services elsewhere if the Health Center is filled to capacity. The Health Center, however, has a sufficient number of beds for all normal needs.

Students who are ill should report promptly to the Health Center for medical care.

Learning Skills Programs

The Department of Learning Skills Programs is continually seeking to develop new programs and approaches to aid students in making the most of their college experience and thus increase student retention.

Carefully selected and trained student counselors under the direct supervision of the Director of Learning Skills conduct a systematic instructional program designed to provide students with the opportunity to develop the kinds of skills necessary for satisfactory performance in college courses. This program is designed to serve all students both the very able learners and students with potential academic problems. Any student, regardless of SAT or ACT score, high school rank, grade point average, or classification is eligible to take the course.

The office of Learning Skills Programs also assists with new student orientation and with obtaining and evaluating assessment data for appropriate programs.

Students who desire more information should contact the Director of Learning Skills, Galloway Business Building, Room 102.

Technical Arts Learning Support Center

The College of Technical Arts operates a Learning Support Center for Technical Arts students who need assistance with their studies. Tutorial assistance in several Technical Arts courses is available.

Placement Center

The Placement Center is a centralized operation responsible for placement activities for all colleges of the University. The placement services are available free of all costs to students, faculty, staff and all former students. The center keeps updated information in career fields and job areas, employers and the kind of employees being sought.

Interviews are scheduled regularly with companies, governmental agencies, schools and other employers.

The center also offers student seminars pertaining to job search techniques, interviews, resume writing and job availability. The Placement Center is located in Room 102 of the Galloway Business Building.

Special Services Program

The Special Services Program, under the auspices of the Vice President for Student Affairs/Dean of Students, is designed to provide support services for students who need academic counseling or other assistance to successfully complete their college education. The goal of the office is to increase the retention and graduation rate of students who, by traditional academic measures, would have difficulty succeeding in college. There are also cultural and social activities and seminars included in the program to motivate, expose and help students learn to think more clearly and effectively in problem-solving situations.

The Special Services Program staff includes a career counselor to help with educational and vocational planning, a mathematics specialist to instruct and assist students who require supplementary help in that area, and a reading specialist to assist students who need help in reading and/or English. In addition, a student tutoring staff is available to provide individualized assistance to program participants. Any student enrolled at Lamar University who is determined to be educationally or economically disadvantaged or physically handicapped is eligible to receive tutoring and participate in the activities of the program.

The program operates in close cooperation with the Counseling and Testing Center, the Office of Retention Services, and the Director of Learning Skills in order to deliver its services in the most efficient, effective, and pervasive manner.

The overall thrust of the program is: (1) to identify those students having academic difficulty; (2) diagnose what the difficulty is; (3) and bring the total resources of the Special Services Program and the university to bear on a given student's problem.

The Special Services Program is located on the second floor of the School of Education in Room 244, P.O. Box 10049, Lamar University, Beaumont, Texas 77710.

Religious Centers

Several denominations provide a full-time ministry to the campus and have established student centers adjacent to the campus.

In addition to credit Bible courses, the centers offer opportunities for worship, noncredit study and counseling to aid the student in developing a meaningful context for his university years.

Student Government Association

The Student Government Association serves as the representative voice of students; as a major facilitator of new and improved student services and programs; and in an important role relative to student judicial proceedings. All regularly enrolled Lamar University students are members of the Student Government Association which affords each student an opportunity to promote, support and participate in a well-rounded student life program.

The President and members of the Student Senate are named each spring in a general student election. The Vice President and Secretary-Treasurer are elected annually by the Student Senate which meets weekly. Student opinions may be expressed at the open meetings of the Senate, or ideas, suggestions, and/or concerns may be submitted through SGA suggestion boxes at various campus locations.

The Student Government Association offices are located in Room 211 of the Setzer Student Center and are staffed by three student officers and a full-time secretary.

Setzer Student Center

The Richard W. Setzer Student Center provides facilities for leisure-time recreation and is the campus center for many extracurricular activities. Completed in 1971 at a cost of \$2,800,000, the Center includes a games area, TV rooms, check cashing/ticket sales, music listening room, snack bar, a pub, graphics operations, reservations office, video lounges, a ballroom, various meeting rooms and lounges. The Center houses the Setzer Student Center Council, Student Government Association, Recreational Sports Office, Student Organizations Office, Alpha Phi Omega Office, Student Publications Offices and various staff members who work with these organizations and many others. Commercial business housed in the Center include the Lamar University Bookstore, the Teachers Credit Union of Beaumont and Campus Cut-Up hair styling shops.

Setzer Student Center Council

The Setzer Student Center Council (SSCC) is the student organization responsible for providing the campus with a variety of programs and extracurricular activities, using the Center for the majority of its functions.

The SSCC is comprised of 12 committees: concert, performing arts, forum, contemporary film, classic film, coffeehouse, recreation, social, video tape, video tape productions, travel and homecoming. Students and members of the faculty and staff are urged to seek membership on these committees.

Student Organizations

More than 125 student organizations currently active at Lamar offer student membership opportunities in one or more of the service, professional, religious, mutual interest, honor, sorority, fraternity or recreational groups. Participation in student organizational activity enhances the education of students, who are strongly encouraged to affiliate with the organization(s) of their choice and participate in the programs.

Recreational Sports

All faculty, staff and currently enrolled students have access to the recreational facilities and may participate in the wide variety of activities that are offered. The Recreational Sports Office is responsible for organizing the activities which are arranged into three different levels of involvement and competition.

The Recreation Program offers the use of the University's facilities for free time recreation. Published schedules and reservations allow the student, faculty or staff member to exercise and enjoy competition with friends at a leisurely pace. Sports equipment is available to be checked out for overnight and weekend excursions or club activities.

The Intramural Program provides an opportunity to participate in supervised, competitive sports between groups within the University community. Persons not involved in varsity athletics are given further opportunity to develop skills learned at the high school level. Organizations may place teams in the All-Sports Division, which consists of competition in 25 different sports, or choose the Independent Division in which specialization in one or more sports may be chosen. The stated purpose of the Intramural Program is to promote human understanding, fair play and behavioral control through the inter-relationships occurring in athletic competition.

Sports Clubs are made up of individuals interested in a specific sport and seek competition beyond the boundaries of the University. Further information on any facet of the Recreational Sports Program may be obtained from Room 212 of the Setzer Student Center.

Publications

University student publications include the *University Press*, a student newspaper published twice a week during the long terms; *The Cardinal*, a full-feature magazine published once a semester; and *Pulse*, a literary magazine of student work.

Offices for *University Press* and *The Cardinal*, both of which serve as training media for students interested in journalism, are at 200 Setzer Center. *Pulse* offices are located in Room 03 of the Liberal Arts Building.

The *Student Handbook* sets forth University policies and procedures relative to student conduct, rights and responsibilities. — It is available at registration and at other times in 116 Wimberly Student Affairs building or 200 Setzer Center. Each student is urged to obtain and read this publication. The *Student Directory* containing a listing of the names, addresses and telephone numbers of students, faculty and administrators — is also available in the Setzer Student Center.

Eligibility for Extracurricular Activities

An extracurricular activity is understood to be an activity representing the student body, any student organization, any department or division organization or any general activity representing the University.

Any full-time student not on disciplinary or scholastic probation, who is officially registered, is eligible to become a candidate and/or to hold student office or to represent the University in any extracurricular activity provided such student has a grade point average of at least 2.0 for both the total of college work completed at Lamar and that of the preceding semester.

For the purpose of establishing eligibility, two six-week summer terms may count as one semester.

Transfer students have the same eligibility as freshman students until completion of one semester.

Student Conduct

In order to meet its educational objectives, an institution of higher learning must expect rational, mature behavior from its constituency. To accept anything less is to invite the destruction of not only academic freedom, but the system of higher education itself.

Student discipline at Lamar is based on an educational philosophy of helping students grow and mature into responsible citizens. When a student behaves in a manner which might require disciplinary action, a careful investigation of all facts is made and the student afforded every opportunity to assist in arriving at just and equitable decisions. Counseling, conferences with parents and/or instructors, conferences with peer groups and other techniques as may seem appropriate, may be employed in making discipline an educational experience.

Hazing

Hazing is prohibited in state educational institutions by the Texas Education Code, Section 4.19. Students of Lamar University are forbidden to engage in, encourage, aid, or assist any person(s) participating in what is commonly known and recognized as hazing. Any student who does so will be subject to university disciplinary action and might also expect to be dealt with by civil authority. Refer to the Student Handbook for more specific definitions and information relative to the legal implications of hazing.

Penalty for False Statements

A student who provides false information or makes false statements to any university official or office or on an official form submitted to the university is subject to immediate dismissal.

Official Summons

An official summons takes precedence over other university activities of the student and should be answered promptly on the day and hour designated. Failure to heed an official summons may subject the student to serious disciplinary action.

Student Debts

The University 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 vice-president for student affairs will take appropriate action.

Penalty for failure to clear up these obligations may be: a) no readmission; b) withholding of grades and transcripts; c) withholding of degree.

Disciplinary Action

A student is subject to disciplinary action for unacceptable behavior, as outlined in the Student Handbook under "Student Conduct and University Discipline." The dean of Student Development may classify behavior as unacceptable and may refer the case to the proper judicial body for investigation and decision. The student has the privilege of appealing the decision to the University Discipline Committee. This appeal is made through the Office of the Dean of Student Development and the action of the Discipline Committee is subject to review by the vice-president for Student Affairs/Dean of Students.

Parking Regulations

Each student who pays the necessary fee is issued a car decal which permits parking on the campus. This decal is numbered and is to be displayed as instructed in official parking and traffic regulations which are issued when automobiles are registered. Strict observance of traffic and parking regulations is necessary for the safe, orderly flow of vehicles in the campus area.

Student Housing

The student housing program is designed to supplement the academic program by providing opportunities for social and intellectual development and recreation in a pleasant living environment. A variety of living styles, designed with most of the conveniences of an

apartment and all the advantages of campus living, include semi-private rooms, modern furniture, carpet, central heating and air conditioning. Residence hall staff assist with programs and serve as advisors and counselors to the residents.

It is recommended that freshmen who do not live with parents or other relatives reside on the campus since the adjustment from high school to college frequently is difficult for the first-year student. In a residence hall, students have easy access to the library, to contacts with upperclassmen in their major fields and to professional counseling.

Students who do not feel the residence hall program meets their personal needs may elect to find living accommodations off-campus.

Applications

To apply for a room in a University residence hall, contact the Housing Office. A check or money order for \$50 must accompany the application. Contracts will be sent to applicants as rooms become available. The contract must be signed and returned with a \$150 payment to be applied to the Fall semester room rent. Failure to do so by July 15 will result in a cancellation of the room reservation by the university housing office. If the student cancels the reservation on or before July 15, the \$150 pre-payment will be refunded. No refunds will be issued on cancellations received after this date.

All unclaimed rooms will be declared vacant and the deposit forfeited at 6 p.m. on the first day of regular registration unless the student gives the Housing Office sufficient notice to hold the room for a longer period. Residents will receive deposit refunds, less any breakage or cleaning charges, at the end of a semester on proper withdrawal from the housing unit. The deposit will not be refunded if the student moves from the housing system before the end of a semester and a penalty will be charged as stated in the housing contract.

Assignments

Permanent assignments cannot be made until the student reports for check-in. The University reserves the right to assign students to specific residence halls and rooms. The University also reserves the right to consolidate residents in order to achieve maximum utilization of facilities. Students may request certain residence halls and rooms, and consideration will be given each request. However, all assignments are made based on the date of deposit.

Dining Halls

Dining halls are located on Redbird Lane, in Brooks-Shivers Hall, and adjacent to Stadium Hall. Snack bars, located in the Setzer Student Center and Beeson Technical Arts Building, provide sandwiches, soft drinks and light lunches. Commuter students may also use the dining halls. A schedule of serving hours may be obtained from the Housing Office.

All resident students are required to be on a University Board Plan.

Fees

Room and Board fees may be paid in one, two or three installments as outlined on the schedule furnished by the Housing Office. Statements will not be mailed to students or parents and a \$10 late fine plus \$1.00 per day will be charged for failure to comply with the established schedule. Failure to pay all University fees by the specified date will result in suspension through the 12th week in the long semester and the 4th week in the summer term. After the 12th week in the long semester and the 4th week in the summer term failure to pay all fees by the specified date will result in suspension at the end of the current semester and may include: a) denial of readmission; b) withholding of grades and transcripts; c) withholding of degree.

For additional information and application forms, write: University Housing Office, Lamar University Station, Box 10041, Beaumont, Texas 77710.

Other Services

Alumni Association

This association of former students of Lamar, including graduates and ex-students, is active on a year-round basis. The executive director of the association maintains an office in the Alumni House, located at the corner of Georgia and Cunningham Streets.

Bookstore

The University operates a bookstore, for the convenience of faculty and students, where supplies and books, new and used, may be purchased. Used books, which are currently approved, may be sold to the bookstore. Books which must be discontinued are not purchased by the Bookstore except at a wholesale price. The Bookstore reserves the right to require the seller to prove ownership of books.

Brown Center

The Brown Center, located off Highway 90 near Orange, became Lamar University property in 1976. It is used as a center of cultural and educational activities for the benefit of the people of Orange County and Southeast Texas. The 87 acres of grounds that comprise the Brown Center include a graceful mansion built in the Southern antebellum tradition, greenhouses, lakes and landscaped grounds.

The estate was a gift to the University from the four sons of the late Edgar W. Brown Jr., Orange industrialist and philanthropist who served as a charter director of the Lamar University Foundation, Inc.

Campus Post Office

The campus Post Office, a contract facility operated by the University, is officially designated as Lamar University Station 77710. Full postal services are offered.

Each student may make application for a box at the Post Office by completing necessary forms. There is a charge for each box. Three students are allowed to share the same box.

Mail may be picked up at the general delivery window by those students who do not choose to reserve boxes at the Post Office.

Computer Center

The University Computer Center is responsible for providing the computing services required by the academic, administrative and research communities of Lamar University.

The Computer Center has a Honeywell 66/20 computer with 256K words of 36 bit MOS memory and approximately 1.1 billion characters of on-line disk storage. The system supports one card reader, one card punch, two line printers and three tape drives at the main site. Over ninety terminals are available for interactive computer use. Extensive communication equipment can connect up to fourteen synchronous and forty-six asynchronous to the computer concurrently. A remote job entry station with one card reader and one printer is located in the Beeson Technical Arts Building.

Academic computing work, particularly students in Computer Science courses, accounts for a large portion of the Computer Center's computer usage. Each student is responsible for preparing his or her own program. Most student programs are usually processed within thirty minutes. Key punches are available for punching cards. All jobs are automatically scheduled by the computer which considers computing time and storage requirements as well as other factors.

The Library

The eight-story Mary and John Gray Library building dominates the campus from its central location. Built to house a million volumes, the Library now occupies six floors with open access to 650,000 volumes. Seating accommodates 1200 students and faculty.

The first floor service areas include circulation, reference, media, and interlibrary loans. The second floor houses reserve reading, current periodicals and government documents. Four floors provide stacks for books and periodicals shelved in Library of Congress classification sequence from class A on the third floor through class Z on the sixth floor.

The seventh and eighth floors offer expansion space for the future, but are presently shared with other University services. Library special collections and a lecture room share the seventh floor with the Public Services Division, Continuing Education programs. The spacious and elegant eighth floor, furnished by community donors, serves as a University Reception Center for meetings and conferences.

Expanding library collections support continuously evolving academic programs. In addition to a strong collection of books and periodicals, the Library provides access to state and federal government documents and participates in the library networks which extend access to information resources. The Library coordinates multi-media programs on campus and is developing basic collections of equipment and materials for central distribution.

Office of Public Service

In addition to providing studies and other services for area business and community organizations, the Office of Public Service conducts on-campus and off-campus instructional programs, for credit and non-credit, with emphasis on adult education. A broad spectrum of vocational and academic courses are offered. Public Service is composed of the departments of Continuing Education and Extramural Education.

Additionally the Office of Public Service administers the Lamar Language Institute.

The institute provides non-academic credit instruction for non-native English speakers seeking functional competence for university study or for communication in an English speaking environment outside the academic setting. Classes are offered in the Fall, Spring and Summer semesters of each year.

At the beginning of each session, students are tested to determine which of the four levels of study is best suited to meet their language needs. A post-test at the end of each session is used to determine progress. Advanced level students are given the Test of English as a Foreign Language (TOEFL) to determine university admissibility with regard to language proficiency.

Classes are taught four hours a day, Monday through Friday. The curriculum includes pronunciation and conversation, listening comprehension, reading and vocabulary development, and grammar and writing skills. Classes are taught exclusively in English. The faculty possesses a wide variety of advanced professional training and experience in English language teaching.

To receive the necessary registration forms, write to Lamar Language Institute, P.O. 10023, LUS, Beaumont, TX 77710.

All forms from students applying from abroad must be received by the LLI no later than July 15 for the fall session; November 15 for the spring session, and April 1, for the summer session.

Veterans' Education

Lamar holds a contract for educating veterans under the Vocational Rehabilitation Law, known as Public Law Number 16, and is an approved university for veterans under Public Law Number 346 and Public Law Number 550. The vocational training has been especially prepared for those who wish to establish themselves in business and industry in the Sabine-Neches area.

Veterans who are interested in continuing their education under federal laws providing such training are directed to secure approval from the Office of Veterans' Affairs, Wimberly Student Affairs Building. Advice on program and training opportunities, academic assistance and counseling is available from this office or by writing to Box 10017, LU Station.

Directory of Personnel 1984-85

Board of Regents

- Lloyd Hayes, Chairman *Port Arthur*
- A.H. (Bob) Montagne, Vice-Chairman *Orangefield*
- Otho Plummer, Chairman Emeritus *Beaumont*
- Merlin Breaux *Sour Lake*
- George A. Dishman, Jr. *Beaumont*
- Thomas M. Maes, II *Beaumont*
- W. Donham Crawford *Beaumont*
- B.A. (Mark) Steinhagen *Beaumont*
- Joseph Deshotel *Beaumont*

Administration

- Kemble, C. Robert, *Ph.D.*, President
- Johnson, Andrew J., *Ph.D.*, Executive Associate to the President
- Geddes, David D., *Ph.D.*, Vice President for Academic Affairs
- Leonard, W. S., *M.S.*, Vice President for University Relations
- Baxley, Oscar K., *M.B.A.*, Vice President for Finance and Personnel
- McLaughlin, George E., *Ed.D.*, Vice President for Student Affairs

Council of Deans

- Bell, Myrtle L., *Ed.D.*, Dean, College of Health and Behavioral Sciences
- Brentlinger, W. Brock, *Ph.D.*, Dean, College of Fine and Applied Arts and Dean of Graduate Studies
- Idoux, John, *Ph.D.*, Dean, College of Arts and Sciences
- Johnston, Maxine, *M.L.S.*, Director of Library Services
- Rode, Elmer G., Jr., *M.Ed.*, Dean of Admissions and Registrar
- Ryan, John A., *Ph.D.*, Dean, College of Business
- Schnur, James O., *Ed.D.*, Dean, College of Education
- Shipper, Kenneth E., *Ph.D.*, Dean, College of Technical Arts
- Wooster, Ralph A., *Ph.D.*, Dean of Faculties and Academic Services
- Young, Fred M., *Ph.D.*, Dean, College of Engineering

Faculty

The following list reflects the status of the Lamar University College of Technical Arts faculty as of May, 1984. The date following each name is the academic year of first service to the University and does not necessarily imply continuous service since that time.

- Baker, Barbara C., 1983, Instructor I of Related Arts
B.A., M.A., University of Southwestern Louisiana
- Bonton, Donald R., 1981, Instructor I of Drafting Technology
A.A.S., Lamar University
- Campbell, Jerry W., 1976, Instructor II of Diesel Mechanics
A.A.S., Lamar University
- Cater, Alice W., 1974, Instructor III of Real Estate
B.B.A., Southern Methodist University; M.B.A., The University of Texas at Austin
- Clark, Lynnwood M. Jr., 1972, Instructor II of Business Data Processing
B.S., Lamar University
- Coates, Nita F., 1980, Instructor I of Drafting Technology

- Danna, John C., 1979, *Instructor II of Drafting Technology*
A.A.S., Lamar University
- Droddy, Frances M., 1979, *Instructor of Child Care Technology*
B.S., Northwestern State U, M.S., Lamar University
- Durgin, Thomas R., 1980, *Instructor I of Industrial Electronics Technology*
- Frederick, Maurice, Jr., 1982, *Instructor I of Refrigeration and Air Conditioning Technology*
- Gardner, Kathryn A., 1979, *Instructor II of Business Data Processing*
B.B.A., Lamar University
- Green, Marcia L., 1972, *Instructor III of Related Arts*
B.A., Bishop College; M.A., Stephen F. Austin State University; M.Ed., Lamar University; Ph.D., Texas Women's University
- Grubbs, Donald R., 1974, *Instructor II of Welding*
B.S., Lamar University
- Hartford, William H., 1947, *Instructor III of Job Relations*
- Harris, Robert M., 1979, *Instructor I of Machine Tools*
A.A.S., Lamar University
- Jarrell, Ben M., 1973, *Instructor III of Refrigeration and Air Conditioning Technology*
- Jones, Bonner R., 1982, *Instructor I of Electrical Technology*
- Jones, Phillip B., 1982, *Instructor I of Industrial Electronics Technology*
A.A.S., Lamar University
- Juarez, Joe I., 1968, *Instructor IV of Basic Communications, Head, Related Arts Department*
B.F.A., University of Houston; B.S., Lamar University; M.Ed., University of Houston.
- Kayton, Cynthia A., 1983, *Instructor of Child Care Technology*
B.F.A., Idaho State University
- Krepper, George, 1982, *Instructor I of Industrial Electronics Technology*
- Kriegel, Otto A., 1973, *Instructor II of Machine Tools*
- Lawrence, Robert J., 1958, *Instructor III of Industrial Electronics Technology*
- Lowrey, Norman E., 1967, *Supervisor, Adult Training Programs*
B.S., Lamar University
- Mainord, Robert A., 1981, *Instructor I of Industrial Electronics Technology*
A.A.S., B.A., Lamar University
- Marble, Ronald I., 1967, *Instructor IV of Welding*
A.A.S., Lamar University
- Matak III, Pete, 1978, *Instructor I of Diesel Mechanics*
A.A.S., Lamar University
- Mathis, Verbie T., 1978, *Instructor II of Mid-Management*
B.S., Texas Eastern University; M.B.E., Stephen F. Austin State University
- Mauer, William H., 1980, *Instructor II of Industrial Electronics Technology*
A.A.S., Lamar University
- Mock, Ralph K., Jr., 1966, *Instructor IV and Program Coordinator of Drafting Technology*
Senior Certified Engineering Technician.
- Musselwhite, John C., 1982, *Instructor I of Industrial Electronics Technology*
- Neissingh, Christian C. Jr., 1982, *Instructor I of Diesel Mechanics*
A.A.S., Lamar University, B.S., New York State University + A Oswego
- Nevils, Kerry I, *Instructor I of Business Data Processing*
A.A.S., Lamar University
- Nylin, Libbie C., 1976, *Instructor II of Related Arts*
B.S., M.S., Lamar University
- Pate, W. L., Jr., 1978, *Instructor I of Mid-Management*
B.B.A., M.B.A., Lamar University

- Ramke, Henry H. Jr., 1981, *Instructor I of Drafting Technology*
B.Arch, Louisiana State University
- Roy, M. Paul, 1963, *Instructor IV of Machine Tools, Head, Industrial Department*
M.A.S.T., Lamar University
- Schroder, John P., 1983, *Instructor I of Electrical Technology*
B.S., Southwestern Louisiana Institute
- Shipper, Kenneth E., 1971, *Dean, College of Technical Arts*
B.S., Sam Houston State University; M.A., Ph.D., The University of Texas at Austin
- Stahl, Deanna K., 1972, *Instructor IV of Technical Mathematics*
B.A.; M.S., Lamar University
- Standley, Troy, 1977, *Instructor III of Fire Protection Technology*
LL.B., Baylor University
- Thompson, Ellis, 1956, *Instructor III of Refrigeration and Air Conditioning Technology*
M.A.S.T., Lamar University
- Walker, Delia A., 1979, *Instructor II of Drafting Technology*
A.A.S., Lamar University
- Wesley, Carey B., 1966, *Instructor IV of Welding*
A.A.S., Lamar University
- Williams, Harry L., 1968, *Vocational Counselor*
B.B.A., Stephen F. Austin State University; M.Ed., Lamar University
- Williams, James A., 1982, *Instructor I of Industrial Electronics Technology*
M.A.S.T., Lamar University
- Wilsker, Ira Lee, 1977, *Instructor II of Mid-Management*
B.S., M.B.A., University of Maryland
- Wilson, Jerry L., 1970, *Instructor IV of Industrial Electronics Technology, Head, Technical Department*
B.S., M.Ed., Lamar University; Ph.D., Texas A&M University

Part-Time Faculty

- Arrington, Alan R., 1983, *Adjunct Instructor of Business Data Processing*
A.A.S., Lamar University
- Baker, Kenneth C., 1978, *Adjunct Instructor of Fire Technology*
A.A.S., Lamar University
- Barnes, Geralann, 1981, *Adjunct Instructor of Related Arts*
B.A., Lamar University
- Burris, Barbara Y., 1971, *Adjunct Instructor of Related Arts*
B.A., Lamar University
- Burton, John, 1983, *Adjunct Instructor of Occupational Safety & Health*
B.S., Dallas Baptist College
- Cater, Otis E., III, 1978, *Adjunct Instructor of Real Estate*
B.S., M.Ed., Lamar University
- Cousins, John, 1983, *Adjunct Instructor of Plant Maintenance*
M.A.S.T., Lamar University
- Degeyter, Connie M., 1982, *Adjunct Instructor of Business Data Processing*
M.A.S.T., Lamar University
- Dowden, Laird W., 1974, *Adjunct Instructor of Refrigeration and Air Conditioning Technology*
M.A.S.T., Lamar University
- Fitzpatrick, James E., 1982, *Adjunct Instructor of Industrial Electronics Technology*
A.A.S., Lamar University
- Franks, Wanda G., 1978, *Adjunct Instructor of Related Arts*
B.S., M.Ed., Lamar University
- Freeman, Brenda L., 1983, *Adjunct Instructor of Mid-Management*
B.B.A., Georgia College, J.D.-Walter F. George School of Law, Mercer University
- Gipson, Errett D., Jr., 1975, *Adjunct Instructor of Drafting Technology*
A.A.S., Lamar University
- Gray, Nancy T., 1981, *Adjunct Instructor of Related Arts*
B.A., Lamar University
- Griffin, Richard P., 1977, *Adjunct Instructor of Occupational Safety and Health*
B.S., Baylor University; M.B.A., Lamar University

- Hebert, Herman G., 1980, *Adjunct Instructor of Refrigeration and Air Conditioning*
A.A.S., Lamar University
- Hedgseph, Joe M., 1981, *Adjunct Instructor of Appliance Repair*
- Herbert, Herman G., 1980, *Adjunct Instructor of Refrigeration and Air Conditioning Technology*
A.A.S., Lamar University
- Huckaby, Dennis E., 1981, *Adjunct Instructor of Electrical Technology*
B.S., B.S.E.E., Lamar University
- Hurlbut, Brain, 1982, *Adjunct Instructor of Business Data Processing*
B.S., Iowa State University, M.S., San Diego State University, M.B.A., University of Houston
- James, Joseph C., 1983, *Adjunct Instructor of Industrial Supervision*
A.A.S., B.S., M.E., Lamar University
- King, Sidney A., 1981, *Adjunct Instructor of Real Estate*
L.L.B., Baylor University
- Kunefke, John, 1983, *Adjunct Instructor of Plant Maintenance*
- Meagher, Thomas F., 1982, *Adjunct Instructor of Electrical Technology*
- Langdon, Randal C., 1983, *Adjunct Instructor of Mid-Management*
B.S., Lamar University
- McKay, Calvin J., 1966, *Adjunct Instructor of Industrial Supervision*
B.S., University of Southwestern Louisiana.
- Moniz, Betram J., 1980, *Adjunct Instructor of Welding*
B.S., University of Aston, England; M.S., University of London
- Monk, David S., 1980, *Adjunct Instructor of Drafting Technology*
- Oliver, Gregory C., 1982, *Adjunct Instructor of Business Data Processing*
B.S., Lamar University
- Patterson, Billy, 1980, *Adjunct Instructor of Plant Maintenance*
- Prater, Penny L., 1982, *Adjunct Instructor of Related Arts*
B.S., Lamar University; B.S., Texas A&M University
- Owen, George G., 1982, *Adjunct Instructor of Real Estate*
B.A., Lamar University
- Radley, Judy, 1983, *Adjunct Instructor of Business Data Processing*
- Reeves, Claudie H., 1981, *Adjunct Instructor of Mid-Management*
B.S., University of New York, B.S., University of Maryland, M.A., University of Northern Colorado
- Reho, Mary E., 1983, *Adjunct Instructor of Business Data Processing*
B.B.A., Lamar University
- Schroeter, William E., 1977, *Adjunct Instructor of Real Estate*
A.A.S., Lamar University
- Severance, Kay E., 1983, *Adjunct Instructor of Business Data Processing*
B.S., University of Southern Louisiana
- Shanks, James E., Jr., 1977, *Adjunct Instructor of Related Arts*
B.S., Lamar University
- Sigur, Ronald D., 1979, *Adjunct Instructor of Drafting Technology*
- Smith, Albert E., 1976, *Adjunct Instructor of Related Arts*
B.S., M.Ed., Stephen F. Austin State University
- Tutt, Stephen C., 1983, *Adjunct Instructor of Diesel Mechanics*
A.A.S. Lamar University
- Stidham, Mary L., 1981, *Adjunct Instructor of Related Arts*
B.A., M.A., Lamar University
- Venza, Anthony J., Jr., 1977, *Adjunct Instructor of Mid Management Repair*
B.A., B.B.A., M.B.A., Lamar University

Index

	Grading System.....	57
	Graduation.....	56
A		
Academic Progress.....		57
Academic Affairs.....		53
Accreditation.....		9
Administration-Faculty.....		71
Admissions.....		11
Adult Training Programs.....		22
Alumni Association.....		68
Associate of Applied Science Degree.....		50
Associate Programs.....		20
B		
Bookstore.....		68
Brown Center.....		69
Business Data Processing.....		42
C		
Certificate Programs.....		56
Change of Address or Name.....		61
Changing Schedules.....		58
Child Care Technology.....		22
Class Absences.....		61
Classification of Students.....		57
Computer Electronics and Robotics Technology.....		49
Counseling and Testing Center.....		63
Course Numbering.....		60
D		
Diesel Mechanics.....		34
Dining Halls.....		68
Diploma Programs.....		56
Division of Public Service.....		70
Drafting Technology.....		50
Dropping Courses.....		58
E		
Electrical Technology.....		23
Electronics Technology.....		52
Eligibility for Extracurricular Activities.....		66
Entrance Requirements.....		11
Evening Classes.....		61
F		
Fees and Expenses.....		15
Financial Aid/Awards.....		12
Fire Protection Technology.....		26
G		
General Information.....		9
Government.....		9
Grade Points.....		59
H		
Hazing.....		67
Health Center.....		62
Honors Graduation With.....		57
Housing.....		67
I		
Industrial Department.....		33
Industrial Electronics Technology.....		52
Industrial Supervision.....		43
L		
Lamar University at Orange.....		55
Lamar University at Port Arthur.....		55
Learning Skills, Improving.....		64
Library.....		69
M		
Machine Tools.....		35
Maintenance Pipefitting.....		28
Mid-Management.....		44
N		
New Courses.....		60
O		
Occupational Safety and Health.....		29
Official Summons.....		67
Organizations.....		65
P		
Parking Regulations.....		67
Payment of Fees.....		15
Placement Center.....		64
Plant Maintenance and Operations.....		30
Post Office.....		69
Probation.....		59
R		
Readmission.....		11
Real Estate.....		47
Records and Transcripts.....		60
Refrigeration and Air Conditioning Technology.....		37
Refunds.....		18
Registration.....		61
Related Arts Department.....		42
Residence Classification.....		19
S		
Scholarships.....		13
Semester Hour.....		61
Senior Citizens Auditing.....		61

Setzer Student Center65
Student Affairs.....63
Student Conduct66
Student Debts67
Student Records62
Suspension59

T

Technical Department.....49
Tuition and Fees.....15

V

Veterans' Affairs.....70

W

Welding.....39
Withdrawals.....38

1. The first part of the document is a list of names and addresses of the members of the committee. The names are listed in alphabetical order, and the addresses are given in full, including the street, city, and state.

2. The second part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of chairman and vice-chairman.

3. The third part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of secretary and treasurer.

4. The fourth part of the document is a list of the names and addresses of the members of the committee who have been elected to the office of member-at-large.

CORRESPONDENCE DIRECTORY

Telephone numbers for all campus stations may be obtained through the central switchboard, Area Code, 409, 838-7011. All correspondence should be directed to Lamar University Station, Beaumont, Texas 77710.

Academic Program	David D. Geddes, Vice President, P.O. Box 10002
Administration	Andrew J. Johnson, P.O. Box 10014
Admission and Records	Elmer Rode, dean, P.O. Box 10009
Application/Information	Dana Ransom, Director of School Relations P. O. Box 10007
Athletic	Pat Foster, Director, P.O. Box 10038
Books/Supplies	P. B. Plotts, Bookstore Manager, P.O. Box 10019
Counseling/Testing	P.O. Box 10040
Development	Geraldine Baldwin, Director, P.O. Box 10568
Financial Affairs	Oscar K. Baxley, Vice President, P.O. Box 10042
Public Information	Joe Lee Smith, Director, P.O. Box 10011
Library	Maxine Johnston, Director, P.O. Box 10012
Placement	Jack Martin, Director, P.O. Box 10012
Research	Charles P. Turco, Director, P.O. Box 10078
Student Affairs	George E. McLaughlin, Vice-President, P.O. Box 10006
Student Health	Lamar C. Bevil, M.D., P.O. Box 10015
Student Housing	Bruce E. Stracener, Director, P.O. Box 10041
Teacher Certification	P.O. Box 10034
Traffic/Security	Gene Carpenter, Director, P.O. Box 10013
Tuition/Fees/Expenses	Finance Office, P.O. Box 10013
Veteran's Affairs	Darrell L. Fondren, Director, P.O. Box 10017
College of Business	John A. Ryan, Dean, P.O. Box 10059
College of Education	Janes Schnur, Dean, P.O. Box 10034
College of Engineering	Fred M. Young, Dean, P.O. Box 10057
College of Fine/Applied Arts	W. Brock Brentlinger, Dean, P.O. Box 10197
College of Health Sciences & Behavioral Sciences	Myrtle E. Bell, Dean, P.O. Box 10022
College of Graduate Students	W. Brock Brentlinger, Dean, P.O. Box 10004
College of Arts and Sciences	John Idoux, Dean, P.O. Box 10058
College of Technical Arts	Kenneth A Shipper, Dean, P.O. Box 10043
LU at Orange	J.B. Welch, Provost, 410 Front St., Orange, Texas 77630
LU at Port Arthur	W. Sam Monroe, Provost, 1500 Proctor, Port Arthur, Texas 77640

Bulletin of
LAMAR UNIVERSITY
Beaumont, Texas 77710

Nonprofit Org.
U.S. Postage
PAID
Permit No. 54

