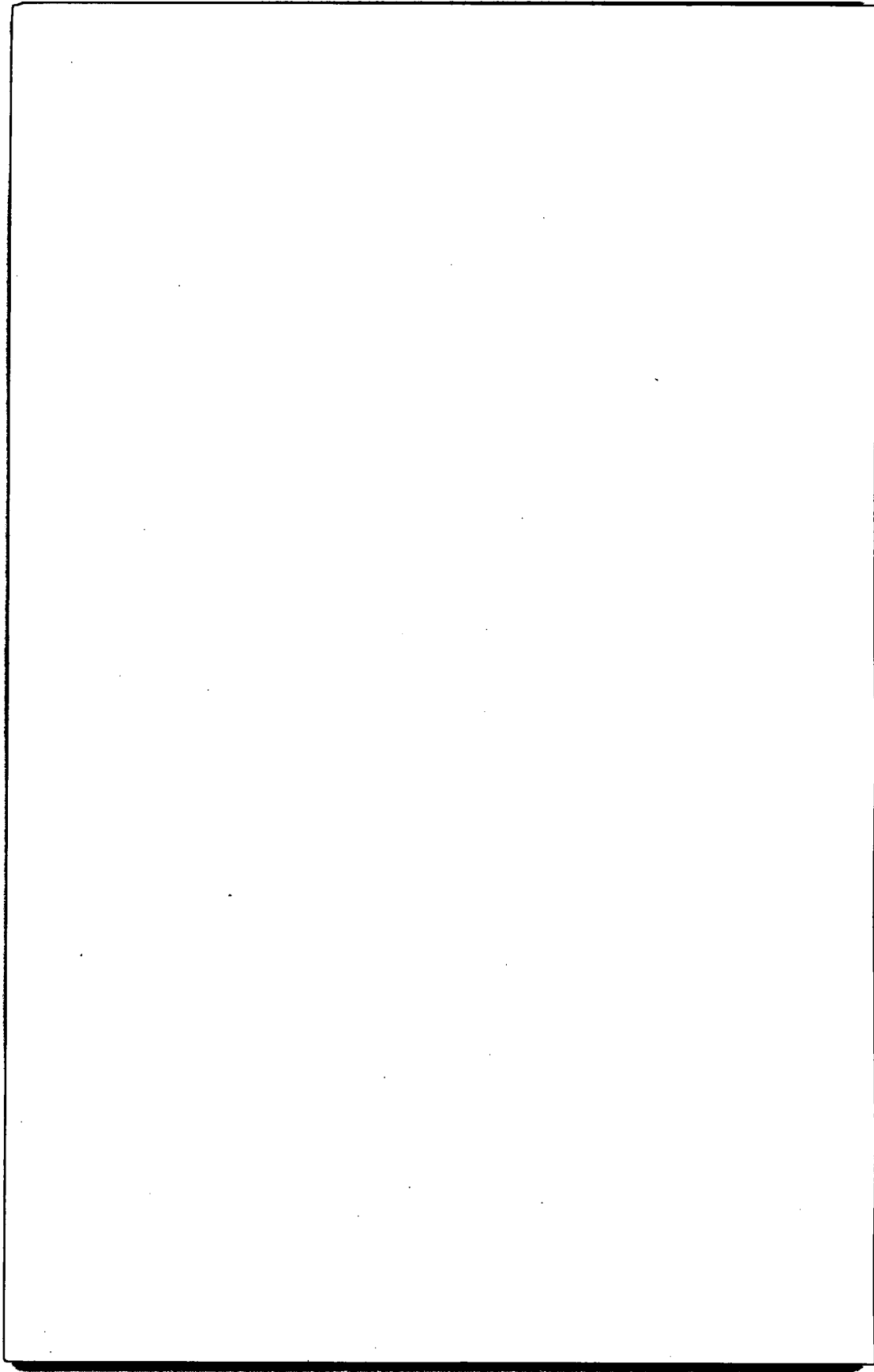


CREATE YOUR FUTURE



LAMAR UNIVERSITY • BEAUMONT  
TECHNICAL ARTS CATALOG 1987-1988





# LAMAR UNIVERSITY

## COLLEGE OF TECHNICAL ARTS 1987-88 • Bulletin • Volume 36 Number 3

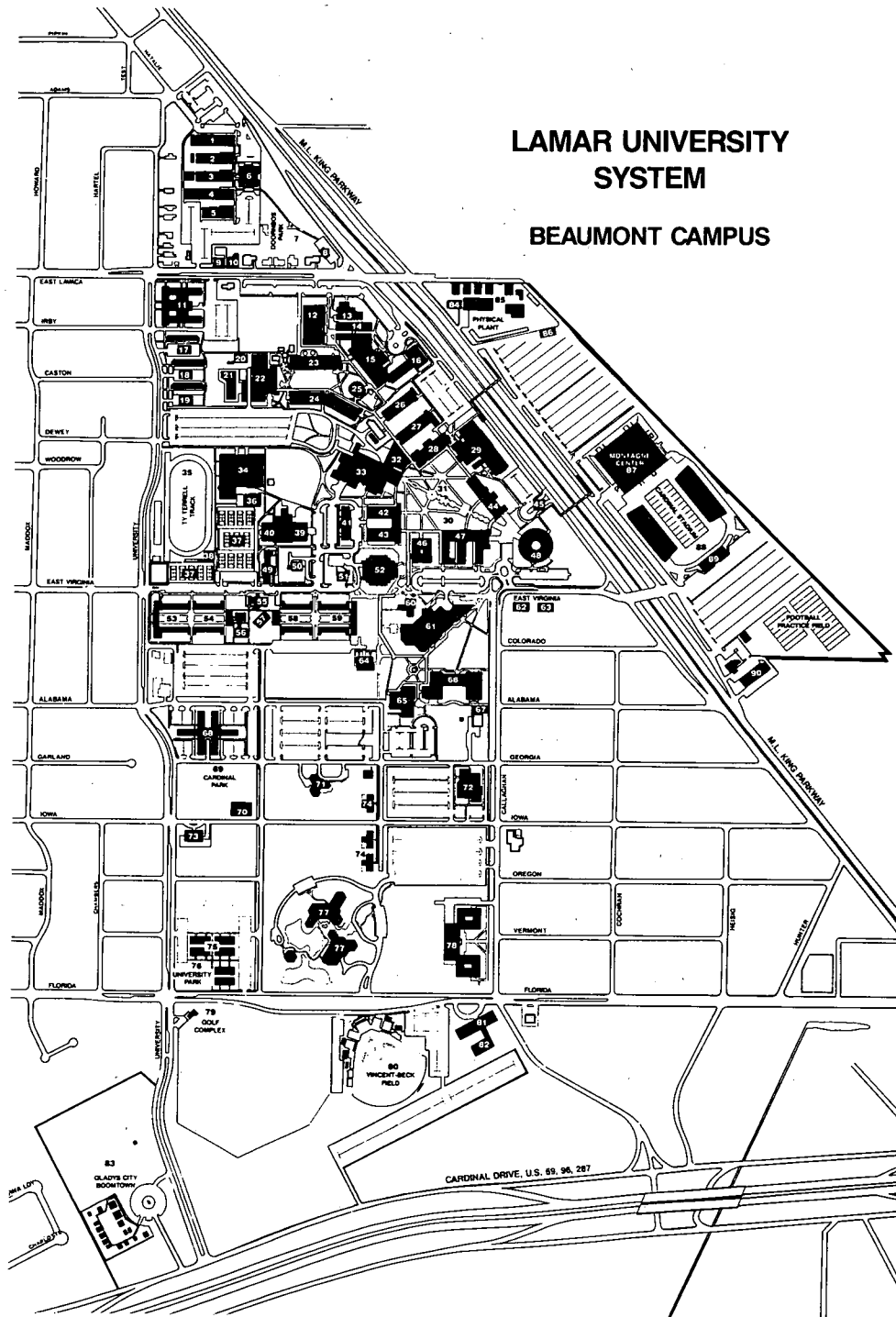
Seventeenth annual catalog issued with announcements for 1987-88.

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 Vice President for Administration, Personnel, and Student Services.

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



**LEGEND TO MAP OF LAMAR UNIVERSITY • BEAUMONT**

Administration (Plummer Bldg.)	48	Newman Catholic Center	62
Alumni House	50	Wesley Foundation Methodist Center	56
Army ROTC	64		
Art Building	14	<b>Residences:</b>	
Biology (Hayes Bldg.)	23	Unit I	19
Bookstore	32	Unit II	18
Business (Galloway Bldg.)	29	Unit III	17
Campus Planning	84	University Drive Apartments	75
Cardinal Park	69	(Men's residence halls)	
Cardinal Stadium	88	Combs	58
Chancellor's Home	71	Morris	59
Chemistry Bldg.	24	Plummer	68
Communication Bldg.	15	Shivers	78
Computer Energy Management Facility	67	Stadium Hall (football)	90
Continuing Education	87	(Women's residence halls)	
Custodial Services	41	Brooks	78
Dental Hygiene Clinic	12	Campbell	54
Dining Hall	39	Gentry (sorority)	11
Dishman Art Gallery	13	Gray	53
Doornbos Park	7	Resource Management Center	10
Early Childhood Development Center	81	Science Auditorium	25
Education Bldg.	65	Setzer Student Center	33
Employment Office	9	Shipping and Receiving	86
Engineering I (Lucas Bldg.)	47	Speech and Hearing Center	72
Engineering II	43	Spindletop Museum	82
Engineering III (Cherry Bldg.)	61	Student Services (Wimberly Bldg.)	44
Faculty-Staff Dining Room	40	Supply Center	42
Fraternity Row	74	System Offices	52
Geology Bldg.	27	Technical Arts Main Bldg. (Beeson)	6
Gladys City Boomtown	83	Technical Arts 1	1
Golf Complex	79	Technical Arts 2	2
Gray Institute	77	Technical Arts 3	3
Gray Library	52	Technical Arts 4	4
Gym Annex	20	Technical Arts 5	5
Health Sciences		Theatre	15
(Mamie McFaddin Ward Bldg.)	12	Tennis Courts	37
Health Center	49	Tennis Pro Shop	38
Home Economics Bldg.	46	Ty Terrell Track	35
Housing Office	51	University Park	76
Information Center	45	University Press	33
J. B. Higgins Fieldhouse	89	Vincent-Beck Stadium	80
KVLU Radio Station	15	Women's Gym	22
Liberal Arts Bldg.	66		
McDonald Gym	34		
Mirabeau B. Lamar Statue	31		
Montagne Center	87		
Music Bldg.	16		
Parking Office	8		
Physical Plant	85		
Physics (Archer Bldg.)	28		
Placement Center	29		
Police Department	41		
Pool (indoor)	22		
Pool (outdoor)	21		
Post Office	41		
President's Home	73		
Print Shop	42		
Psychology Bldg.	26		
Public Affairs Bldg.	60		
Quadrangle	30		
Quick Copy Center	42		
Racquetball-Handball Court	36		
Recreational Pavilion	70		
Religious Centers			
Baptist Student Center	57		
Church of Christ Center	63		
Episcopal Center	55		

**REGISTER OF OFFICES**

Office	Building Number
Academic deans (by college)	
Arts and Sciences	24
Business	29
Education	65
Engineering	61
Fine Arts and Communication	13
Graduate Studies and Research	44
Health and Behavioral Sciences	12
Technical Arts	6
Admissions and Records	44
Chancellor & System Offices	52
Computer Center	61
Counseling and Testing	44
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# 1987-88 Calendar

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

## Fall Semester-1987

### AUGUST

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

### SEPTEMBER

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### OCTOBER

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### NOVEMBER

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### DECEMBER

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26	27	28	29	30	31	

### August 1987

- 20 International Student Orientation
- 21 Orientation — New Students
- 23 Dormitories open at 1 p.m.  
Dining halls open at 4:30 p.m.
- 24 Registration begins
- 25 Registration
- 27 Classes begin  
Schedule revisions—late registration
- 28 Last day for schedule revisions and/or late registration

### September 1987

- 7 Labor Day—no classes
- 14 Twelfth Class Day

### October 1987

- 9 Last day to drop or withdraw without penalty  
Last day to petition for no grade
- 13 Last day to apply for December graduation  
Last day to pay for diploma; cap and gown

### November 1987

- 13 Last day to drop or withdraw
- 16-20 Early registration for Spring Semester
- 25 Thanksgiving recess begins at 10 p.m.  
Dining halls close at 6 p.m.  
Dormitories close at 10 p.m.
- 29 Dormitories open at 1 p.m.  
Dining halls open at 4:30 p.m.
- 30 Classes resume at 8 a.m.

### December 1987

- 9-15 Final examinations
- 16 Dining halls close at 10 a.m.  
Dormitories close at 12 noon
- 17 Grades for graduating seniors due by 8:30 a.m.  
All grades due by 4 p.m.
- 19 Commencement

## Spring Semester-1988

### JANUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
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24	25	26	27	28	29	30
31						

### FEBRUARY

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28	29					

### MARCH

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### APRIL

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### MAY

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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### January 1988

- 7 International Student Orientation
- 8 Orientation—New students
- 10 Dormitories open at 1 p.m.  
Dining halls open at 4:30 p.m.
- 11 Registration begins
- 12 Registration
- 14 Classes begin  
Schedule revisions—late registration
- 15 Last day for schedule revisions and/or late registration
- 29 Twelfth Class Day

### February 1988

- 25 Last day to drop or withdraw without penalty  
Last day to petition for no grade
- 26 Last day to apply for May graduation  
Last day to pay for diploma; cap and gown

### March 1988

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

### April 1988

- 1 Good Friday
- 12 Last day to drop or withdraw
- 18-22 Early registration for Fall semester

### May 1988

- 4-10 Final examinations
- 11 Dining halls close at 10 a.m.  
Dormitories close at 12 noon
- 12 Grades for graduating students due by 8:30 a.m.  
All grades due by 4 p.m.
- 14 Commencement

## Summer Session 1988-First Term

### May 1988

- 26 International Student Orientation
- 29 Dormitories open at 1 p.m.  
Dining halls open at 4:30 p.m.
- 30 Registration
- 31 Classes begin—schedule revisions and/or late registration

### JUNE

S	M	T	W	T	F	S
				1	2	3
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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

### June 1988

- 1 Last day for schedule revisions and/or late registration
- 6 Fourth Class Day
- 13 Last day to drop or withdraw without penalty  
Last day to petition for no grade
- 14-16 Orientation—Session I
- 27 Last day to apply for August graduation  
Last day to pay for diploma; cap and gown  
Last day to drop or withdraw

### July 1988

- 6 Last class day
- 7 All grades due by 4 p.m.

## Summer Session 1988-Second Term

### JULY

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

### AUGUST

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

### July 1988

- 6 Registration
- 7 Classes begin—Schedule revisions and/or late registration
- 11 Last day for schedule revisions and/or late registration
- 13 Fourth Class Day
- 16-18 Orientation—Session II
- 20 Last day to drop or withdraw without penalty  
Last day to petition for no grade

### August 1988

- 2-4 Orientation—Session III
- 3 Last day to drop or withdraw
- 11 Last class day  
Dining halls and dormitories close at 6 p.m.
- 12 All grades due by 8:30 a.m.
- 13 Commencement

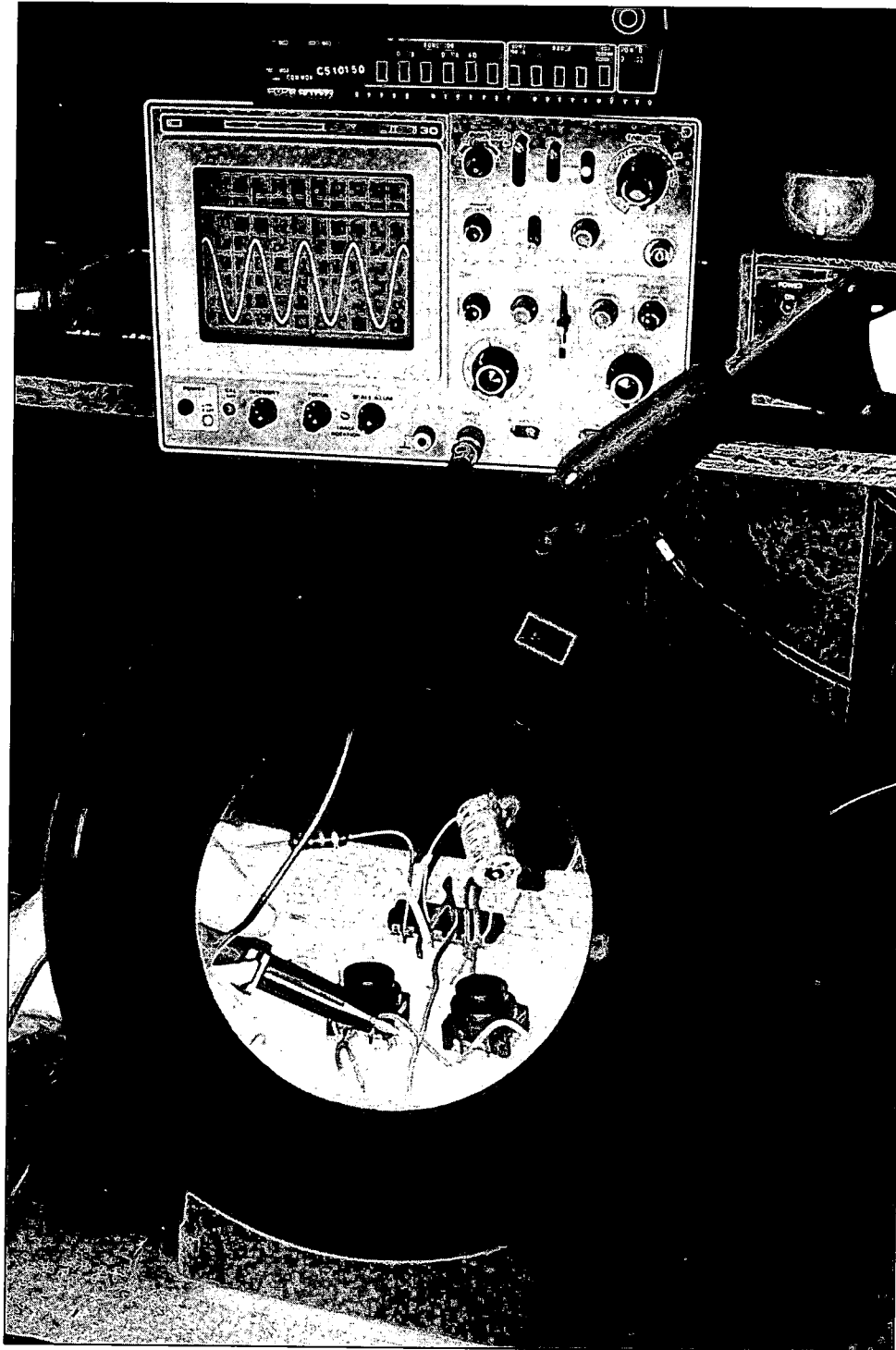
Summer schedule subject to revision.



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Dean of Technical Arts: Kenneth E. Shipper  
Editor: Louise L. Wood  
Art Director: Sherrie Booker Branick  
Cover Photography by Jan Johnson  
Photography With Text by Rick Campbell



A magnifier amplifies the view of intricate electronics circuitry in the Lamar University College of Technical Arts.

## General Information

### Location

Lamar University, a state-supported institution, is situated in Beaumont, one of the world's largest petrochemical centers. Beaumont is one of the 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 Preserve.

### 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 years 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.

The University's status was again changed when the Texas Legislature passed a bill creating the Lamar University System. The bill was signed into law on June 19, 1983.

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 chancellor, presidents, campus administrative officers and faculty.

### Accreditation

Lamar is accredited by, or a candidate for accreditation by, the Commission on Colleges of 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 programs in Chemical, Civil, Electrical, Industrial and Mechanical Engineering are accredited by the Accreditation Board for Engineering and Technology. The undergraduate and graduate programs of the College of Business are accredited by the American Assembly for Collegiate Schools of Business.

In the College of Health and Behavioral Sciences, Dental Hygiene is accredited by the American Dental Association; Radiologic Technology, Respiratory Technology and Respiratory Therapy by the American Medical Association; and Nursing by the National League for Nursing.

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 College of Education by the National Council for the Accreditation of Teacher Education; and Council on Social Work Education; and programs in Speech Pathology by the American Speech-Language-Hearing Association and in Deaf Education by the Council for Education of the Deaf.

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

## **Mission Statement**

Lamar University-Beaumont is a multipurpose university commissioned by the Texas Legislature to provide an environment for learning for the people of the state. The University is an educational, scientific, technical, and cultural resource center committed to the three-fold mission of teaching, research, and service. The University seeks partnerships with business, governmental, industrial, and other educational organizations to more efficiently accomplish its goals.

## **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**

### **Admission Services, Orientation and Recruitment**

The Office of Admission Services, 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 409/880-7516.

### **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 Office of Admissions, 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 Director of Admission Services. 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.

### **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 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, 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 Office of Admission Services 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 of 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, 2209 Calder, Beaumont, Texas 77701, 835-2511.

## **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, 106B Wimberly (880-8026).

## 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.....	\$240
Student Services Fee.....	75
General Use Fee.....	90
Setzer Student Center Fee.....	20
Student Health Fee.....	15
Parking Fee (if desired).....	15
Health Insurance (if desired).....	56
Books (estimated).....	150

\$661

+ lab fees

Part-time Student (Six semester hours):

Tuition.....	\$100
Student Services Fee.....	61
General Use Fee.....	36
Setzer Student Center Fee.....	20
Student Health Fee.....	6
Parking Fee (if desired).....	15
Health Insurance (if desired).....	56
Books and Incidentals (estimated).....	60

\$354

+ lab fees

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

\*Tuition for Texas residents taking 6 hours or less is \$100 per semester. Each additional semester hour is \$16 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.

### Fall 1987

No. of Semester Hours	Tuition		Student Service Fee	General Use Fee	Setzer Center Fee	Health Center Fee	Total Charge	
	Texas Resident	Non-Texas Resident					Texas Resident	Non-Texas Resident
1	\$100	\$ 120	\$26	\$20	\$20	\$ 5	\$171	\$ 191
2	100	240	33	20	20	5	178	318
3	100	360	40	20	20	5	185	445
4	100	480	47	24	20	5	196	576
5	100	600	54	30	20	5	209	709
6	100	720	61	36	20	6	223	843
7	112	840	68	42	20	7	249	977
8	128	960	75	48	20	8	279	1,111
9	144	1,080	75	54	20	9	302	1,238
10	160	1,200	75	60	20	10	325	1,365
11	176	1,320	75	66	20	11	348	1,492
12	192	1,440	75	72	20	12	371	1,619
13	208	1,560	75	78	20	13	394	1,746
14	224	1,680	75	84	20	14	417	1,873
15	240	1,800	75	90	20	15	440	2,000
16	256	1,920	75	90	20	15	456	2,120
17	272	2,040	75	90	20	15	472	2,240
18	288	2,160	75	90	20	15	488	2,360
19	304	2,280	75	90	20	15	504	2,480
20	320	2,400	75	90	20	15	520	2,600

### Summer 1988

1	\$ 50	\$ 120	\$26	\$20	\$10	\$ 5	\$111	\$ 181
2	50	240	33	20	10	5	118	308
3	50	360	37	20	10	5	122	432
4	50	480	37	24	10	5	126	556
5	60	600	37	30	10	5	142	682
6	72	720	37	36	10	6	161	809
7	84	840	37	42	10	7	180	936
8	96	960	37	48	10	8	199	1,063
9	108	1,080	37	54	10	9	218	1,190
10	120	1,200	37	60	10	10	237	1,317

### 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 \$56 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 honorably 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**

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.

**Faculty and Staff with Activity Cards**

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

## Matriculation Fee

A matriculation fee of \$15 will be incurred by students who withdraw prior to the first day of class. This \$15 fee will be deducted from refunds.

## Returned Check Fees

Checks written in payment of registration fees and returned to the University due to insufficient funds will result in a \$10 check charge plus a \$15 late registration fee.

A student already enrolled in the University 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
Doctor's Diploma .....	12.00
Bachelor's Cap and Gown (disposable) .....	15.50
Master's Cap, Gown and Hood Rental .....	25.50
Doctor's Cap, Gown and Hood Rental .....	27.50
Returned Checks (Bookstore) .....	10.00
Re-entry Fee .....	10.00
Financial Aid 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

### **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.

### **Determining Residence Status**

Texas law specifies that if there is any question as to the student's right to classification as a resident of Texas, it is the student's responsibility to (1) have his classification officially determined and (2) to register under the proper classification. Classification will follow the guidelines in Title 3, Texas Education Code. Students with questions should contact the Director of Admissions, P.O. Box 10009, Beaumont, Texas 77710.

## 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 Cecil R. Beeson Technical Arts classroom and office building was completed for occupancy for the fall of 1977. Parking for 650 cars is provided adjacent to these buildings. Entrances to this area, located in the 4400 block of M. L. King Jr. Parkway, is on Lavaca and Adams streets. 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; computer drafting technology; diesel mechanics; electrical 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

#### Technical Department

- Computer Electronics and Robotics Technology
- Computer 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 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 programs 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 Sciences
- Radiologic Technology—College of Health and Behavioral Sciences
- Associate Degree Nursing—College of Health and Behavioral Sciences
- Respiratory Technology—College of Health and Behavioral Sciences



The AC/DC laboratory provides instruction and hands-on experience for electrical technology students enrolled in one of several Adult Training programs.

## 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 132 Business Communications or Eng 131	3:3:0	TM 134 Business Mathematics	3:3:0
TM 132 Fundamentals of Math II	3:3:0	Humanities elective	3:3:0
	15:15:0		18:15:10
Third Semester		Fourth Semester	
*CCT 231 Advancing Language Use	3:2:2	*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
POLS 231 Introduction to American Government	3:3:0		
	18:14:12		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.

### 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 indepth 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.  
*Prerequisites: CCT 131 and CCT 132.*
- 231 Advancing Language Use 3:2:2**  
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	
OSH 131 Intro Occupational Safety	3:3:0	PM 1418 Related Physics	4:3:2
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 136 Three Phase AC Lab I	3:0:6
ELE 137 DC and Single Phase AC Lab	3:0:6	ELE 139 Three Phase AC Lab II	3:0:6
TM 1334 Electronics Math	3:3:0	BC 132 Business Communications	3:3:0
	18:12:12		19:12:14
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	3:0:6
ELE 236 Power Distribution Lab	3:0:6	ELE Electives	6:3:6
ELE 237 AC-DC Machines Lab	3:0:6	General Education Elective	3:3:0
BC 231 Technical Writing	3:3:0		18:12:12
	18:12:12		
Electives			
ELE 235 Electrical Power Generation	3:3:0		
ELE 2310 Trouble Shooting Techniques	3:3:0		
ELE 2311 Industrial Installations	3:0:6		

## Electrical Technology Courses (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.
- 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 1334
- 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.
- 133 Electrical Blueprint Reading II** (3:2:2)  
A continuation of ELE 130 with emphasis on the mathematics involved in code applications.

- 134 Three Phase AC Theory I** (3:3:0)  
A study of the generation, distribution, transformation and utilization of three phase current.
- 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.
- 136 Basic Electrical Lab** (3:0:6)  
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 1334
- 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.
- 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.
- 139 Three Phase AC Lab II** (3:0:6)  
A continuation of ELE 138 with emphasis of phase correction for inductive and capacitance loads.
- 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 OSH Act.
- 231 Electrical Power Distribution** (3:3:0)  
A detailed study of transformers, relays, utility lines and installation practices.
- 232 AC-DC Machines** (3:3:0)  
A study of the various types of AC-DC motors and their characteristics.
- 233 Electrical Codes and Standards II** (3:3:0)  
A continuation of ELE 230.
- 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.
- 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.
- 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.
- 237 AC-DC Machines Lab** (3:0:6)  
Practical experiments with electrical machines, controls and accessories will be conducted in this laboratory course.
- 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.
- 2310 Trouble Shooting Techniques** (3:3:0)  
Techniques and equipment used in diagnosing and remediating electrical malfunctions will be studied in this course.
- 2311 Industrial Installations** (3:0:6)  
Skills in the installation of rigid, explosion proof electrical systems 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	3:3:0	IT 131 Pneumatic Instruments I	3:3:0
IET 131 DC Theory and Circuits		IT 132 Pneumatic Instruments II	3:3:0
ELE 136 Basic Electrical Lab or		IT 136 Pneumatic Instruments Lab I	3:0:6
IET 136 DC Lab	3:0:6	IT 137 Pneumatic Instruments Lab II	3:0:6
PM 1418 Related Physics	4:3:2	BC 132 Business Communications	3:3:0
PM 1340 Industrial Hydraulics	3:2:2	JR 231 Job Relations	3:3:0
OSH 131 Introduction to Occupational Safety and Health	3:3:0		
TM 1334 Electronics Math	3:3:0		
	19:14:10		18:12:12
Third Semester		Fourth Semester	
IT 231 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 Writing	3:3:0
PM 1320 Unit Operations	3:3:0	IS 1312 Applied Supervision	3:3:0
	18:12:12		18:12:12

## Instrumentation Technology Courses (IT)

<b>131 Pneumatic Instruments I</b>	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.	
<b>132 Pneumatic Instruments II</b>	3:3:0
A continuation of Pneumatic Instruments I with emphasis on loop configuration and interfacing.	
<b>136 Pneumatic Instruments Lab I</b>	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.	
<b>137 Pneumatic Instruments Lab II</b>	3:0:6
Experimentation with changing parameters for loop operation and troubleshooting techniques.	
<b>231 Electronic Instruments</b>	3:3:0
A study of electrical generating, inducing and activating devices.	
<b>232 Analyzer Theory and Application</b>	3:3:0
A study of various analyzers utilized in process and environmental analysis.	
<b>233 Automated Manufacturing Processes</b>	3:3:0
Application of robots, instrumentation and electro-mechanical systems in metal machining and forming, assembling and other manufacturing tasks.	
<b>234 Control System</b>	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.	
<b>235 Introduction to Robotics</b>	3:3:0
Introduction to robotics relative to instrumentation. A study of pneumatic, hydraulic and electrical power supplies and controls used by industrial robots.	
<b>236 Electronic Instrument Lab</b>	3:0:6
A lab course to prepare the student to align, repair and diagnose problems incurred with electronic/electromechanical controllers, recorders, and transmitters.	
<b>237 Analyzer Lab</b>	3:0:6
A laboratory course in operation and maintenance of various analytical devices including O <sub>2</sub> , CO <sub>2</sub> , H <sub>2</sub> S, and boiler stack gas analysis.	
<b>238 Control Systems Lab</b>	3:0:6
A study of the interface between various instruments. Techniques of isolation of defective components in instrumentation loops will be explored.	
<b>239 Electro Mechanical Systems Lab</b>	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 131 English Composition	3:3:0	FT 135 Ind Fire Protection II	3:3:0
PM 1419 Related Chemistry	4:3:2	Spc 131 Public Speaking	3:3:0
TM 132 Fundamentals of Math II or		PM 1418 Related Physics	4:3:2
Mth 1334	3:3:0		
	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
POLS 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  
Forceable 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; 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, 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 Fire 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.
- 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.

## 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 132 Business 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
PM 1419 Related Chemistry.....	4:3:2	SOC 131 Introduction to Sociology.....	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
BC 231 Technical Writing.....	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)

<b>131 Introduction to Occupational Safety and Health</b>	<b>3:3:0</b>
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.	
<b>132 Safety and Health Standards, Codes and Regulations</b>	<b>3:3:0</b>
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.	
<b>133 Physical Hazards Control I</b>	<b>3:3:0</b>
An in-depth study of the basic responsibilities and techniques for safety inspections and control of, or removal of hazards from the site.	
<b>134 Vehicle and Traffic Safety</b>	<b>3:3:0</b>
A basic introduction to problems and practices of vehicle and traffic safety programming with emphasis on regulatory requirements.	
<b>231 Physical Hazards Control II</b>	<b>3:3:0</b>
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.	
<b>232 Health Hazard Recognition</b>	<b>3:3:0</b>
The subject matter of the course deals with the fundamentals of industrial hygiene and surveying techniques.	
<b>233 Human Factors in Safety</b>	<b>3:3:0</b>
Designed to acquaint the student with the physiological and psychological factors that contribute to accident causation. An exploration of theoretical and research findings.	
<b>234 Safety Program Management</b>	<b>3:3:0</b>
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.

## 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.
- 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** 3:2:2  
The operation and maintenance of hydraulic equipment, including basic hydraulics and all types of pumps, motors and controls, will be studied in this course.



Students concentrate on the precision and skills needed to become craftsmen as they study machine tools, one of the Industrial Department's varied offerings.



# Industrial Department

Department Head: Carey B. Wesley

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 132 Fundamentals of Math II	3:3:0	Elective†	3:3:0
BC 132 Business Communication	3:3:0		
	18:12:14		15:9:14

†By Approval

Suggested Electives: MM 131, 132, 135, 138, 231; DM 133; CDT 133; IET 133; TM 134; MT 133, 136, 137, 138, 139; WLD 133, 136, 137, 138, 139.

## Appliance Repair Courses (AR)

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

## 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 tune 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 132 Fundamentals of Math II or Approved Mth (Math Dept)	3:3:0	Elective*	3:3:0
BC 132 Business Communications or Eng Comp (Eng Dept)	3:3:0	BC 231 Technical Writing or Eng Comp (Eng Dept)	3:3:0
	18:12:14		18:12:14
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
	18:12:14		18:12:14

†By Approval

Suggested Technical Arts electives: MT 133; Wld 133; MT 136, 137, 139; WLD 136, 137, 138, 139, 233.

## Diesel Mechanics Courses (DM)

- |            |                                                                                                                                                                                                                            |              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>131</b> | <b>Introduction to Diesel Mechanics</b><br>General description and construction of engines, diesel engine principles, frames, cylinders, heads and pistons.                                                                | <b>3:3:0</b> |
| <b>132</b> | <b>Diesel Cycle Application</b><br>The diesel cycle, its advantages and applications. The basic problems of operations and the design and construction of diesel engines are studied.                                      | <b>3:3:0</b> |
| <b>133</b> | <b>Small Engines</b><br>The operation and repair of small, internal combustion engines. Diagnosis and troubleshooting will be emphasized.                                                                                  | <b>3:3:0</b> |
| <b>134</b> | <b>Related Systems</b><br>Engine cooling, air intake systems, exhaust systems and starting systems.<br>Prerequisites: DM 131 and DM 132.                                                                                   | <b>3:3:0</b> |
| <b>135</b> | <b>Maintenance and Repair Problems</b><br>Maintenance and repair problems of the diesel engine. The checking of bearing clearances and the installation of piston rings are stressed.<br>Prerequisites: DM 131 and DM 132. | <b>3:3:0</b> |

- 136 Basic Shop Procedures** 3:0:7  
Installation, operation, maintenance and repair of diesel engines, hand tools and precision instruments, shop safety, fastening devices and tubing fabrication.
- 137 Precision Instrument Application** 3:0:7  
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.
- 138 Tune-up and Repair** 3:0:7  
Valve reconditioning, cylinder head repairs, engine operation and testing, diesel engine operation; shop safety, engine adjustments, cylinder and piston reconditioning.  
Prerequisites: DM 136 and DM 137.
- 139 Accessory Servicing** 3:0:7  
Repair of water pumps, oil pumps, fuel pumps, blowers, minor engine tune-up, valve and turbocharger repair.  
Prerequisites: DM 136 and DM 137.
- 231 Ignition and Combustion Principles** 3:3:0  
Electrical systems, governors, fuels and combustion, and fuel systems.  
Prerequisites: DM 131 and DM 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.  
Prerequisites: DM 131 and DM 132.
- 234 Overhaul Procedures** 3:3:0  
Engine overhauling, special repairs, salvaging, hydraulics and terms used in diesel engineering.  
Prerequisites: DM 231 and DM 232 or DM 134 and DM 135.
- 235 Fuel Injection Systems** 3:3:0  
Fuel injection systems, hydraulics and its application, engine tune-up and troubleshooting.  
Prerequisites: DM 231 and DM 232 or DM 134 and DM 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.  
Prerequisites: DM 138 and DM 139 or DM 136 and DM 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.  
Prerequisites: DM 138 and DM 139 or DM 136 and DM 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.  
Prerequisites: DM 236 and DM 237 or DM 138 and DM 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.  
Prerequisites: DM 236 and DM 237 or DM 138 and DM 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 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 Introduction to 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 Machines	3:0:7
MT 137 Bench Tools and Layout	3:0:7	MT 139 Milling and Grinding	3:0:7
TM 132 Fundamentals of Math II or Approved Mth (Math Dept)	3:3:0	BC 231 Technical Writing or Eng Comp (Eng Dept)	3:3:0
BC 132 Business Communications or Eng Comp (Eng Dept)	3:3:0	Elective*	3:3:0
	18:12:14		18:12:14
Third Semester		Fourth Semester	
MT 231 Appl Lathe and Drill Press	3:3:0	MT 234 Adv Grinding and Milling	3:3:0
MT 232 Adv. 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 Adv. Milling Machine	3:0:7
MT 237 Adv. Lathe Use	3:0:7	MT 239 Special Projects	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

\*Technical Arts electives: DM 133; CDT 133; Wld 133, 136, 137, 138, 139.

## Machine Tools Courses (MT)

<b>131 Introduction to Hand and Machine Tools</b>	<b>3:3:0</b>
A study of hand and machine tools used in the machine shop, with emphasis on safety, measuring tools, layout and drilling machines. Basic blueprint reading is studied.	
<b>132 Fundamentals of the Lathe</b>	<b>3:3:0</b>
Consideration of the engine lathe, its uses and capabilities. Grinding lathe turning tools. Introduction to CNC lathe use, tooling and fundamentals of programming. Continued study of blueprints. Safety.	
<b>133 Machine Shop</b>	<b>3:3:1-3</b>
Practice in the use of hand and machine tools of the modern machine shop.	
<b>134 Introduction to Milling Machines</b>	<b>3:3:0</b>
Applications of vertical and horizontal milling machines. Cutters, operations and setups. Gears and indexing devices. Blueprint interpretation. Safety.	
<b>135 Introduction to Grinding Machines</b>	<b>3:3:0</b>
Grinding machines, grinding wheels and abrasive machining. Shapers and their setup for use. Basic metal heat treatments. Basics of CNC vertical milling machine use. Blueprints, sketches and drawings. Safety.	
<b>136 Basic Lathe and Drill Press</b>	<b>3:0:7</b>
Practical use of standard measuring and hand tools. Bench work. Basic use of the engine lathe and drill press, with emphasis on their safe use. Basics of lathe cutting tools and drill grinding.	
<b>137 Bench Tools and Layout</b>	<b>3:0:7</b>
A continuation of experiences with bench tools, layout and measuring tools. Setups and operation of the lathe and drill press, performing tasks common to each. Introduction to CNC lathe use.	
<b>138 Milling Machines</b>	<b>3:0:7</b>
Typical setups for use of the vertical and horizontal milling machines. Use of dividing heads, rotary table and boring head. Setup and uses for the shaper. Safety in the use of machine tools.	
<b>139 Milling and Grinding</b>	<b>3:0:7</b>
Additional experiences with milling machines. Gears, keyseats, flats and grooves. Use of the surface grinder and other machine tools in conjunction with the milling machine. Introduction to CNC milling machines.	

- 231 Applications of the Lathe and Drill Press** 3:3:0  
Details of layouts and setups. Types of external and internal threads. Lathe attachments. Writing programs for use of the CNC lathe. Continued blueprint study.  
Prerequisites: MT 131 and MT 132
- 232 Advanced Lathe and Drill Press** 3:3:0  
Problems encountered in diverse applications of the lathe and drill press. Precision measuring and gauges. Continuation of CNC lathe uses. Blueprint problems.  
Prerequisites: MT 131 and MT 132.
- 233 Special Projects** 3:3:1 to 3  
Lecture and laboratory instruction in specialized areas of machine tool use under the supervision of a faculty member.  
Prerequisite: AAS in Machine Tools, or consent of instructor.
- 234 Advanced Milling and Grinding** 3:3:0  
Tooling and setups for more complex parts. Helical milling. Indexing problems. Offset boring head use. CNC milling machine setup and use. Advanced blueprint interpretation.  
Prerequisites: MT 134 and MT 135.
- 235 Problems in Milling and Grinding** 3:3:0  
Machine setups for diverse applications of the milling machine. Tool and cutter grinding. Surface grinder. Use of CNC lathes and CNC milling machines. Advanced blueprint reading.  
Prerequisites: MT 134 and MT 135.
- 236 Multi-Machine Projects** 3:0:7  
Jobs and processes involving the use of several machine tools, especially the lathe. Emphasis on methods common to industry. Fits and finishes are stressed. Internal and external threads of different types. Experiences with CNC lathe use.  
Prerequisites: MT 136 and MT 137.
- 237 Advanced Lathe Use** 3:0:7  
Continuation of projects with close tolerances. Stress placed on time utilization. Precision turning, boring, and fits. Use of lathe attachments. Projects with the CNC lathe.  
Prerequisites: MT 136 and MT 137.
- 238 Advanced Milling Machine** 3:0:7  
Tasks assigned are progressively more difficult. Student initiative and ingenuity are expected. Parts interchangeability and precision are emphasized. Introduction to tool and cutter grinding. CNC milling machine use.  
Prerequisites: MT 138 and MT 139.
- 239 Special Projects** 3:0:7  
Special projects are used to expand mechanical skills and machining ability. Maintenance and repair of laboratory machine tools. Continued use of CNC milling machine and CNC lathe.  
Prerequisites: MT 138 and MT 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 132 Fundamentals of Math II or Approved Mth (Math Dept)	3:3:0	BC 231 Technical Writing or Eng Comp (Eng Dept)	3:3:0
BC 132 Business Communications or Eng Comp (Eng Dept)	3:3:0	Elective**	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 Sys	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 Servicing	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.

\*\*Technical Arts electives: CDT 133; Wld 133, 136, 137, 138, 139.

## 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.  
*Prerequisites:* RAC 131 and RAC 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.  
*Prerequisites:* RAC 131 and RAC 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.  
*Prerequisites:* RAC 136 and RAC 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.  
*Prerequisites:* RAC 136 and RAC 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.  
Prerequisites: RAC 134 and RAC 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.  
Prerequisites: RAC 134 and RAC 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.  
Prerequisites: RAC 231 and RAC 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.  
Prerequisites: RAC 231 and RAC 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.  
Prerequisites: RAC 138 and RAC 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.  
Prerequisites: RAC 138 and RAC 139.
- 238 Advanced Air Conditioning Servicing** 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.  
Prerequisites: RAC 236 and RAC 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.  
Prerequisites: RAC 236 and RAC 237.

## Welding

The welding industry governs various metal joining processes. It is the most common method for permanently connecting the sections necessary for building or repairing 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 operator and procedure 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 132 Fundamentals of Math II or Approved Mth (Math Dept)	3:3:0	BC 231 Technical Writing or Eng Comp (Eng Dept)	3:3:0
BC 132 Business Communications or Eng Comp (Eng Dept)	3:3:0	Elective**	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	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 Plate Welding.

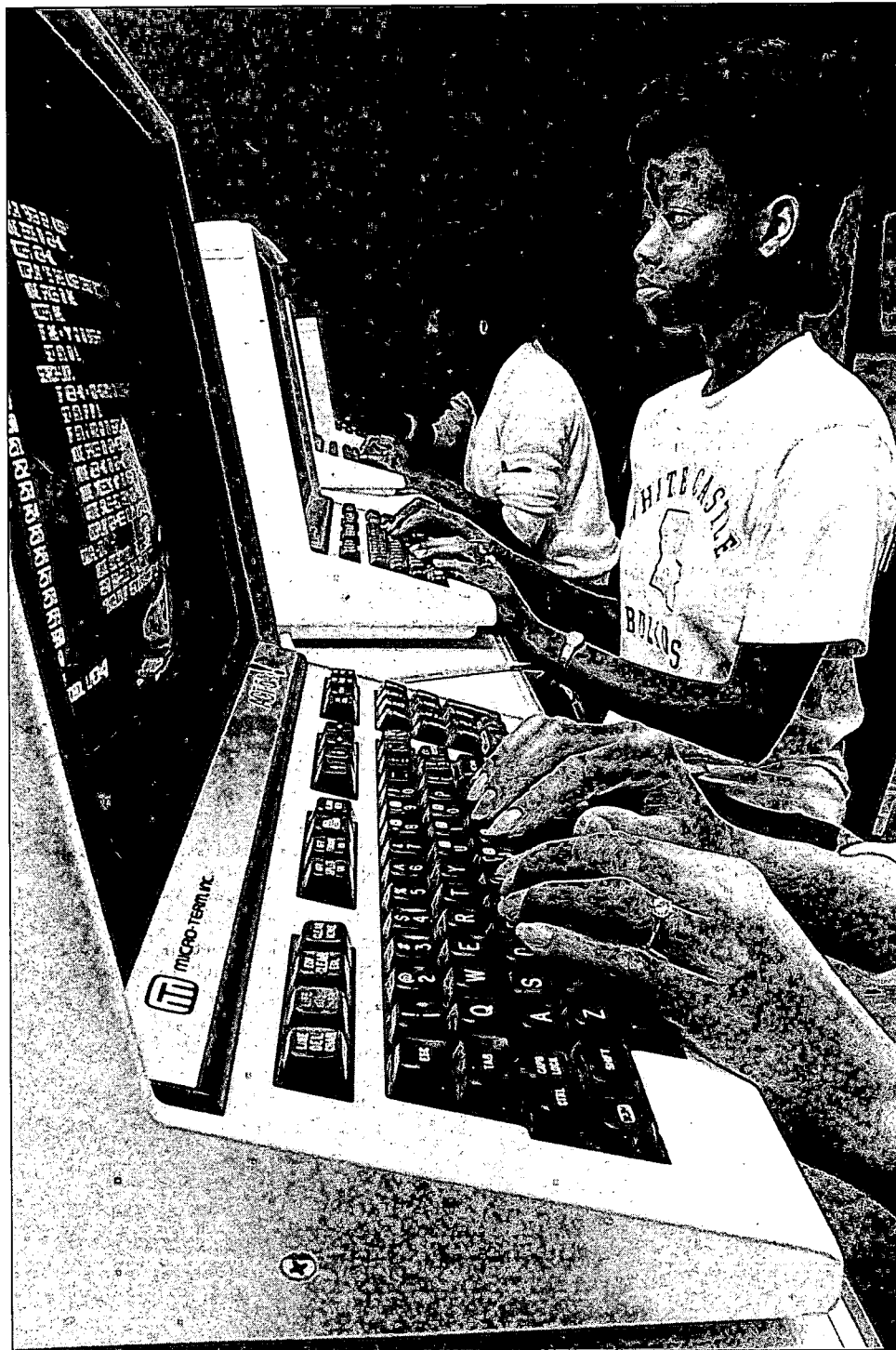
\*\*Technical Arts electives: DM 133; CDT 133; MT 133, 136, 137, 138, 139.

## 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.  
*Prerequisites: Wld 131 and Wld 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.  
*Prerequisites: Wld 131 and Wld 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 weld test procedures.  
*Prerequisites: Wld 136 and Wld 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.  
Prerequisites: Wld 136 and Wld 137.
- 231 Weld Tests and Inspection. Pipe Welding and Layout** 3:0:7  
An in-depth study of weld tests and their uses. Introduction to pipe, pipe fittings and layout as used in the welding field. Sketching and blueprint reading extended.  
Prerequisites: Wld 131 and Wld 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.  
Prerequisites: Wld 131 and Wld 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.  
Prerequisites: Wld 134 and Wld 135 or Wld 231 and Wld 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.  
Prerequisites: Wld 134 and Wld 135, or Wld 231 and Wld 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).  
Prerequisites: 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).  
Prerequisites: Wld 136 and Wld 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.  
Prerequisites: Wld 138, and Wld 139 or Wld 236 and Wld 237.
- 239 Advanced Pipe Welding** 3:0:7  
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 "MIG" (GMAW) welding. Plasma arc cutting.  
Prerequisites: Wld 138 and Wld 139, or Wld 236 and Wld 237.



Business data processing, one of several programs offered in the Related Arts Department, prepares students for careers in computer programming.

## Related Arts Department

Department Head: Joe I. Juarez

229 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.

### 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 FORTRAN I	4:3:2
BDP 144 COBOL I	4:3:2	BDP 241 COBOL II	4:3:2
BC 132 Business Communications or Eng Comp (Eng Dept)	3:3:0	TM 1331 Algebra Trig	3:3:0
TM 134 Business Mathematics	3:3:0	BC 231 Technical Writing or Eng Comp (Eng Dept)	3:3:0
	16:15:2		17:15:4
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		17:15:2
	17:15:4		

\*By approval; three hours must be a general education elective.

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

### Business Data Processing Courses (BDP)

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <p><b>131 Introduction to Technical Accounting</b></p> <p>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.</p> <p><b>133 Introduction to Business Data Processing</b></p> <p>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.</p> <p><b>136 Technical Accounting</b></p> <p>A continuation of accounting principles begun in BDP 131.<br/>Prerequisite: BDP 131 with grade C or better.</p> <p><b>142 FORTRAN I</b></p> <p>A study of the FORTRAN programming language. Progressive techniques are developed through programming, definition, flow charting, coding, documentation and execution.</p> <p><b>144 COBOL I</b></p> <p>A study of the COBOL programming language. Progressive techniques are developed through program definition, flow charting, coding, documentation and program execution.</p> <p><b>146 Introduction to Programming—BASIC</b></p> <p>Programming concepts and techniques developed through the BASIC language. Emphasis on problem solving using a flowcharting approach. Instruction in debugging and testing business and mathematical problems.</p> | <p><b>3:3:0</b></p> <p><b>3:3:0</b></p> <p><b>3:3:0</b></p> <p><b>4:3:2</b></p> <p><b>4:3:2</b></p> <p><b>3:2:2</b></p> |
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<b>231</b>	<b>System Design</b>	<b>3:3:0</b>
	Fundamentals of system design analysis and documentation. Problems in designing, analyzing, changing an existing system, and implementation.	
<b>230</b>	<b>Advanced Technical Accounting</b>	<b>3:3:0</b>
	A continuation of accounting principles that were begun in BDP 131 and BDP 136. Prerequisite: BDP 136 with grade C or better.	
<b>245</b>	<b>RPG</b>	<b>4:3:2</b>
	A study of the RPG language. Progressive techniques are developed through problem definition. Flowcharting and coding. Prerequisite: BDP 142 or consent of the instructor.	
<b>233</b>	<b>Principles of Technical Cost Accounting</b>	<b>3:3:0</b>
	Accounting for material, labor and overhead under job cost, process cost and standard cost systems. Prerequisite: BDP 136 or consent of the instructor.	
<b>241</b>	<b>COBOL II</b>	<b>4:3:2</b>
	A continuation of BDP 144 with emphasis on table handling and disk file processing. Prerequisite: BDP 144.	
<b>243</b>	<b>FORTRAN II</b>	<b>4:3:2</b>
	The application of FORTRAN to business and numerical problems. Prerequisite: BDP 142.	
<b>244</b>	<b>COBOL Applications</b>	<b>4:3:2</b>
	Defining problems for business application and programming the solutions using primarily the COBOL Language. Prerequisite: BDP 241.	
<b>246</b>	<b>BASIC II</b>	<b>4:3:2</b>
	The course is to further the programming skills of students who have completed BDP 146. Prerequisite: BDP 146.	
<b>247</b>	<b>Assembly Language</b>	<b>4:3:2</b>
	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 industry 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 231 Technical Writing .....	3:3:0
*BC 132 Business Communications .....	3:3:0	TM 134 Business Mathematics .....	3:3:0
TM 132 Fundamental Mathematics II .....	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
<hr/>		<hr/>	
15:15:0		15:15:0	

**Third Semester**

*IS 1313 Critical Path Scheduling	3:3:0
Soc 131 Introduction to Sociology	3:3:0
IS 1325 Industrial Communication I	3:3:0
*MM 232 Human Resources Management	3:3:0
**Electives (6 hours)	6:6:0

18:18:0

**Fourth Semester**

MM 238 Legal Aspects of Business	3:3:0
*IS-1322 Labor Relations and Legislation	3:3:0
Spc 131 Public Speaking	3:3:0
IS 235 Training and Developing Workforce	3:3:0
IS 231 Time and Motion Studies	3:3:0
*Elective (3 hours)**	3:3:0

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)**

<b>1312 Applied Supervision</b>	<b>3:3:0</b>
A study of applied psychology as related to the management of personnel; 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.	
<b>1313 Critical Path Scheduling</b>	<b>3:3:0</b>
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.	
<b>1315 Cost Reduction</b>	<b>3:3:0</b>
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.	
<b>1322 Labor Relations and Legislation</b>	<b>3:3:0</b>
Company policy, labor history, legislation and labor unions, the labor contract, grievances and arbitration are included in this course.	
<b>1325 Industrial Communications I</b>	<b>3:3:0</b>
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.	
<b>231 Time and Motion Studies</b>	<b>3:3:0</b>
This course is designed to acquaint the industrial supervisor with the techniques of improving productivity through more productive practices.	
<b>235 Training and Developing Workforce</b>	<b>3:3:0</b>
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.

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

**Recommended Program of Study****First Semester**

MM 131 Survey of Business	3:3:0
MM 132 Free Enterprise System I	3:3:0
BC 132 Business Communications or English Composition	3:3:0
TM 132 Fundamental Mathematics II	3:3:0
BDP 133 Introduction to Business Data Proc	3:3:0

15:15:0

**Second Semester**

MM 135 Free Enterprise System II	3:3:0
BC 231 Technical Writing or English Composition	3:3:0
TM 134 Business Mathematics	3:3:0
MM 138 Fundamentals of Supervision & Leadership	3:3:0
BDP 131 Introduction to Technical Accounting	3:3:0
*Elective (3 hours)	3:3:0

18:18:0

**Third Semester**

MM 231 Small Business Management	3:3:0
MM 2311 Internship Seminar	3:1:15
BDP 136 Technical Accounting	3:3:0
Soc 131 Introduction to Sociology	3:3:0
MM 232 Human Resources Management	3:3:0
*Elective (3 hours)	3:3:0

18:16:15

**Fourth Semester**

IS 1322 Labor Relations & Legislation	3:3:0
MM 2312 Internship Seminar	3:1:15
Spc 131 Public Speaking	3:3:0
MM 238 Legal Aspects of Business	3:3:0
*Elective (3 hours)	3:3:0

15:13:15

\*By approval

Suggested Electives; BDP 230, BDP 142, 144, 146; MM 133, 134, 237; RES 1311, 1312, 1313, 1314, 2315, 2316; BA 331, 332, 3301, IS 1313, 1315; OSH 131.

**Mid-Management Courses (MM)**

<b>131 Survey of Business</b>	<b>3:3:0</b>
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.	
<b>2311, 2312 Internship Seminar</b>	<b>3:1:15</b>
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.	
<b>132 Free Enterprise System I</b>	<b>3:3:0</b>
A basic introduction to macroeconomics for the vocational student.	
<b>133 Principles of Selling</b>	<b>3:3:0</b>
Precepts of effective selling in the American economy. Sales process; prospecting; presentation; objections; and closing.	
<b>134 Personal Money Management</b>	<b>3:3:0</b>
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.	
<b>135 Free Enterprise System II</b>	<b>3:3:0</b>
A practical application of the free enterprise system to the individual and his business. A basic introduction to microeconomics for the vocational student.	
<b>138 Fundamentals of Supervision and Leadership</b>	<b>3:3:0</b>
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.	
<b>231 Small Business Management</b>	<b>3:3:0</b>
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.	
<b>232 Human Resources Management</b>	<b>3:3:0</b>
An elementary and practical approach to the problems with employees as individuals and groups, including those represented by unions.	
<b>237 Retailing</b>	<b>3:3:0</b>
The development, organization, methods, policies of operation and problems in the marketing structure.	
<b>238 Legal Aspects of Business</b>	<b>3:3:0</b>
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)**

<b>132 Business Communications</b>	<b>3:3:0</b>
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 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. Computer literacy is also included.

## 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  
Extension and application of algebraic skills. Polynomials, factorization, algebraic and complex algebraic functions, equations, systems of equations, quadratic formula, and the complex number system.  
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.
- 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, and complex numbers.
- 1334 Electronic Mathematics** 3:3:0  
Binary, octal, decimal, and hexadecimal base systems. Operations in binary. Boolean algebra. Algebraic techniques including polynomials, literal equations, applications of simple equations, and systems of equations involving two and three equations.
- 231 Applied Geometry** 3:3:0  
Introduction to geometry, areas of polygons, triangles, circles, prisms, cylinders, pyramids, cones, frustums, 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.

## 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 131 Real Estate Appraising.....	3:3:0
Elective .....	3:3:0	Elective .....	3:3:0
<hr/>		<hr/>	
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	<hr/>	
<hr/>		15:11:30	
15:15:0			

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

## Course Description (PTA)

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



## Recommended Program of Study

First Semester		Second Semester	
English Composition .....	3:3:0	English Composition .....	3:3:0
TM 134 Bus Math. ....	3:3:0	BDP 133 Intro to BDP .....	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
	15:15:0		15:15:0
Third Semester		Fourth Semester	
POLS 231 American Government .....	3:3:0	Psy 131 Introduction to Psychology .....	3:3:0
Spc 131 Public Speaking .....	3:3:0	RES 2315 Real Estate Development .....	3:3:0
MM 231 Small Business Management .....	3:3:0	RES 2316 Real Estate Invest and Management .....	3:3:0
RES 1314 Real Estate Law .....	3:3:0	RES 2317 Real Estate Current Trends and Problems .....	3:3:0
RES 2318 Real Estate Brokerage .....	3:3:0	Approved Elective .....	3:3:0
	15:15:0		15:15:0

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

## Real Estate Courses (RES)

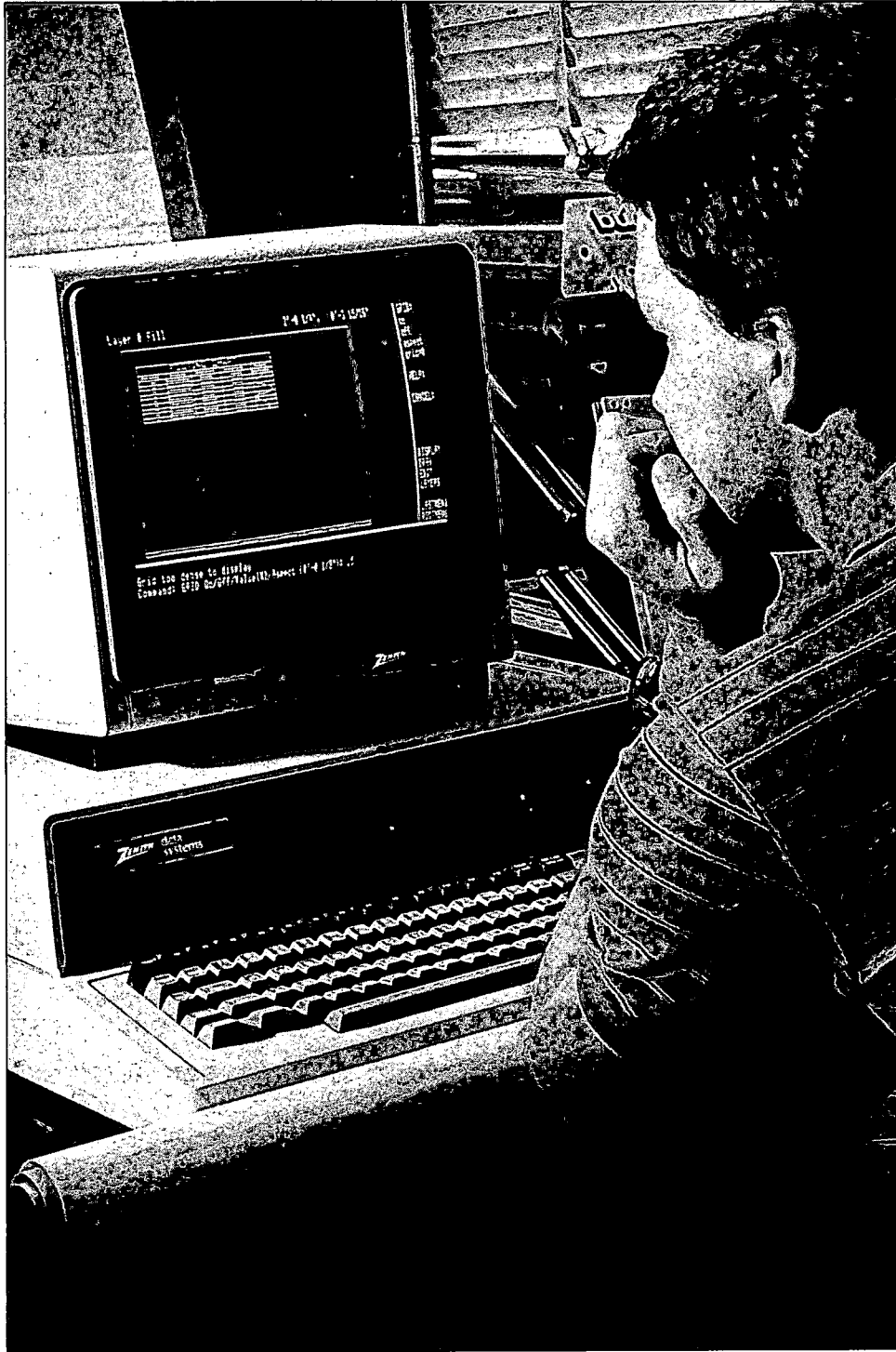
- 1301 Real Estate Internship** 3:1:15  
The student works with a real estate related business for 15 hours a week. The duties and activities are aimed at providing a training program for the student. Students, as a group, meet once a week with the instructor to analyze their work experience and relate it to their course in real estate.  
Prerequisite: RES 1311.
- 1311 Real Estate Principles and Practices**  
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, closing and basic objectives.  
Prerequisite: RES 1311.
- 2313 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.  
Prerequisites: RES 1311 and RES 1313.
- 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.  
Prerequisites: 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.



Students in computer drafting technology classes have the advantage of state-of-the-art equipment and instruction in the Technical Department.

## Technical Department

Department Head: Dr. Jerry L. Wilson

231 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 180 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 the 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

First Semester		Second Semester	
CRT 1301 Electronic Circuits I	3:3:0	CRT 1303 Industrial Circuits I	3:3:0
CRT 1302 Electronic Circuits II	3:3:0	CRT 1304 Digital Logic I	3:3:0
CRT 1306 Electronic Circuits Laboratory I	3:0:6	CRT 1305 Digital Logic II	3:3:0
CRT 1307 Electronic Circuits Laboratory II	3:0:6	CRT 1308 Digital Logic Laboratory I	3:0:6
TM 1334 Electronic Mathematics or Mth 1334 (Math Dept)	3:3:0	CRT 1309 Digital Logic Laboratory II	3:0:6
BC 132 Business Communications or Eng. 131 (Eng. Dept)	3:3:0	CS 1311 Computer Science (Computer Science Dept)	3:3:0
	18:12:12		18:12:12
Third Semester		Fourth Semester	
CRT 2301 Microprocessor Theory I	3:3:0	CRT 2303 Industrial Circuits II	3:3:0
CRT 2302 Microprocessor Theory II	3:3:0	CRT 2304 Computer Systems I	3:3:0
CRT 2306 Microprocessor Theory Laboratory I	3:0:6	CRT 2305 Robotic Systems II	3:3:0
CRT 2307 Microprocessor Theory Laboratory II	3:0:6	CRT 2308 Computer Systems Laboratory I	3:0:6
TM 232 Industrial Mathematics or Mth 1341 (Math Dept)	3:3:0	CRT 2309 Robotic Systems Laboratory II	3:0:6
BC 231 Technical Writing or Eng. 132 (Eng. Dept)	3:3:0	Elective (Requires departmental approval)	3:3:0
	18:12:12		18:12:12

### Computer Electronics and Robotic Technology Courses (CRT)

All CRT courses must be completed with a grade of C or better. Any CRT major not earning a grade of C or better in attempted CRT course work will be required to repeat and complete the course(s) with a grade of C or better or obtain departmental approval before continuing to take courses as a CRT major.

- 1301 Electronics Circuits Theory I** 3:3:0  
This course covers dc circuit action, Ohm's law, electronic units, series and parallel circuits, capacitance and time-varying signals.  
Corequisite: TM 1334 (or equivalent) to be taken concurrently.

- 1302 Electronic Circuits Theory II** 3:3:0  
This course covers ac circuits, inductance, impedance, rectifiers, power supplies and regulation and op-amps.  
Prerequisites: CRT 1301 and TM 1334.
- 1303 Industrial Circuits I** 3:3:0  
This course covers industrial safety, electrical components, electronic components, rectifier circuits, power supplies and regulators, discrete and integrated amplifiers and optoelectronics.  
Prerequisite: CRT 1307.
- 1304 Digital Logic Theory I** 3:3:0  
This course covers digital techniques and numbering systems, digital semiconductors, digital logic circuits, digital integrated circuits, boolean algebra, RS, D, T and JK flip flops, registers and introduction to counters.  
Prerequisites: CRT 1307 and TM 1334.
- 1305 Digital Logic Theory II** 3:3:0  
This course develops counters, shift registers, clocks, decoders, encoders, displays, multiplexers, demultiplexers, X-OR circuits, ALUs, RAMs, ROMs, PLAs, and op-amps.  
Prerequisite: CRT 1304.
- 1306 Electronic Circuits Laboratory I** 3:0:6  
This course consists of "hands-on" familiarization with multimeters, oscilloscopes, power supplies, signal generators, electronic components, schematic symbols, color codes and wiring techniques.  
Prerequisite: CRT 1301 or to be taken concurrently.
- 1307 Electronic Circuits Laboratory II** 3:0:6  
This course involves experimentation and analysis of series and parallel ac circuits, filters, power supply designs and op-amp applications.  
Prerequisite: CRT 1306. CRT 1302 is prerequisite or to be taken concurrently.
- 1308 Digital Logic Laboratory I** 3:0:6  
This course covers practical exercises with number systems and experiments with digital semiconductors, digital logic circuits, digital integrated circuits, boolean algebra, RS, D, T and JK flip flops, registers and simple counters.  
Prerequisite: CRT 1307. CRT 1304 is prerequisite or to be taken concurrently.
- 1309 Digital Logic Laboratory II** 3:0:6  
This lab course builds upon the prerequisite course by giving practical experiments with counters; shift registers; clocks and one shots; decoders, encoders, and displays; multiplexers, demultiplexers, X-OR circuits, ALUs, RAMs, ROMs and op-amps.  
Prerequisite: CRT 1308. CRT 1305 is prerequisite or to be taken concurrently.
- 2301 Microprocessor Theory I** 3:3:0  
The purpose of this course is to expand and/or build the knowledge acquired in the Digital Logic courses through utilization of microprocessor based systems. Architecture, data handling, control and timing, and machine language fundamentals, all as related to microprocessors, are covered in depth. Also, an introduction to interfacing techniques using typical IC's with various bus structures is included. Must be taken concurrently with CRT 2306.  
Prerequisites: CRT 1303 and 1309.
- 2302 Microprocessor Theory II** 3:3:0  
This course contains detailed and advanced microprocessor interfacing techniques and the development of machine language programs necessary for software implementation of diagnostics. Applications of several special purpose IC's; i.e. DAC's, demultiplexary, interface adaptors, PTM's and I/O Ports, all as related to microprocessor utilization are covered in detail. Must be taken concurrently with CRT 2307.  
Prerequisite: CRT 2301.
- 2303 Industrial Circuits II** 3:3:0  
This course covers transistor switching circuits, SCR circuits, triac circuits and operational amplifier circuits. Also included are feedback systems, servomechanisms and input transducers.  
Prerequisite: CRT 2307.
- 2304 Computer Systems** 3:3:0  
This course covers the internal structure of microcomputer systems, to include the bus structure, timing, generation, video scanning, CPU architecture, memory management, disk controllers, disk drives, printer interfacing and communication interfacing.  
Prerequisite: CRT 2307.

- 2305 Robotic Systems** **3:3:0**  
 This course covers robotics and their application to the automated manufacturing system. Included are principles of robotic operation. Various coordinate systems are investigated. Hydraulic, pneumatic and electromagnetic drive systems are covered.  
*Prerequisite: CRT 2304.*
- 2306 Microprocessor Laboratory I** **3:0:6**  
 This course requires the student to construct several basic types of microprocessor related circuits, utilize basic diagnostic routines, and develop essential troubleshooting and repair skills. Application and utilization of test equipment in performing the above functions along with pertinent safety precautions are also covered. Must be taken concurrently with CRT 2301.  
*Prerequisites: CRT 1303 and CRT 1309.*
- 2307 Microprocessor Laboratory II** **3:0:6**  
 This course contains a multitude of various microprocessor interfacing experiments using many different types of IC's, requiring more advanced diagnostic and troubleshooting techniques. Additionally, several types of microprocessor based equipment with differing peripherals are utilized in this course. Must be taken concurrently with CRT 2302.  
*Prerequisite: CRT 2306.*
- 2308 Computer Systems Laboratory** **3:0:6**  
 This course consists of a "hands-on" familiarization with microcomputer systems and will include the operation of various types of troubleshooting equipment. Students will use digital pulsers, logic probes, logic analyzers, signature analyzers and microcomputer analyzers.  
*Prerequisite: CRT 2307. CRT 2304 is prerequisite or to be taken concurrently.*
- 2309 Robotic Systems Laboratory** **3:0:6**  
 This lab course requires the student to manipulate and maintain a computer controlled robotic system. Material included covers assembly and disassembly of a hydraulic robot and operation of a dc-series motor robot and a stepping motor robot.  
*Prerequisite: CRT 2308. CRT 2305 is prerequisite or to be taken concurrently.*
- 2361 Special Topics in Electronics** **6:0:12**  
 An investigation into specialized areas of electronics under the direct guidance of a departmental faculty member. This course may be repeated for credit when topics of investigation differ. Registration for this course requires departmental approval.
- 2661 Special Topics in Electronics** **6:0:12**  
 An investigation into specialized areas of electronics under the direct guidance of a departmental faculty member. This course may be repeated for credit when topics of investigation differ. Registration for this course requires departmental approval.

## Computer 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 computer aided drafting or conventional 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 the computer or by conventional drafting procedures, 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	
CDT 131 Drafting Instruments	3:3:0	CDT 134 Civil-Arch Drafting	3:3:0
CDT 132 Fund of Drafting	3:3:0	CDT 135 Civil-Arch Techniques	3:3:0
CDT 136 Basic Drafting Lab I	3:0:6	CDT 138 Civil-Arch Lab I	3:0:6
CDT 137 Basic Drafting Lab II	3:0:6	CDT 139 Civil-Arch Lab II	3:0:6
BC 132 Business Communications or Eng 131 (Eng Dept)	3:3:0	CDT 2301 Introduction to Computer Aided Drafting	3:0:6
TM 132 Fundamentals of Math II or Math 1334 (Math Dept)	3:3:0	TM 232 Industrial Math or Math 1341 (Math Dept)	3:3:0
	18:12:12		18:9:18
Third Semester		Fourth Semester	
CDT 231 A.S.M. Standards, Pipe and Fitting Designs	3:3:0	CDT 234 A.I.S.C. Specifications and Standards	3:3:0
CDT 2321 Process Pipe Drafting and Design	3:3:0	CDT 2351 Theoretical Appl. of CAD to Structural Steel	3:0:6
CDT 236 Systems Drafting Lab I	3:0:6	CDT 238 Structural Design Lab I	3:0:6
CDT 2371 Pipe Drafting and Computer Design Lab	3:0:6	CDT 2391 Computer Aided Structural Design Lab	3:0:6
CDT 2331 Computer Aided Drafting Proc.	3:0:6	BC 231 Technical Writing or English 132 (English Dept)	3:3:0
IS 1312 Applied Supervision or CS 1311 Computer Science (Computer Science Dept) or Approved Soc. (Soc. Dept)	3:3:0	Elective*	3:3:0
	18:9:18		18:9:18

\*Elective requires departmental approval.

## Computer Drafting Technology Courses (CDT)

- 131 Drafting Instruments 3:3:0**  
This course teaches the professional use of all drafting instruments. Included is the construction of freehand and mechanical lettering, linework, dimensioning, sketching, orthographic projection and geometric construction. TM 1331 (or equivalent) to be taken concurrently.
- 132 Fundamentals of Drafting 3:3:0**  
Includes projection of sectional views, conventions, various methods of pictorial drawings, welding symbols, and other technology required in the profession. Course concludes with basic commands used in computer aided drafting.  
Prerequisite: CDT 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**  
Introduces architectural history, drafting techniques and theory of design for floor plans, elevations foundations, sections and site plans for residential structures. TM 232 and CDT 2301 are to be taken concurrently.  
Prerequisite: CDT 132.
- 135 Civil-Architectural Drafting Techniques 3:3:0**  
Introduces terminology and techniques used in surveying and building construction estimating. Includes drafting techniques and theory of design for light commercial buildings and residential electrical installations.  
Prerequisite: CDT 132 and TM 232. CDT 134 and CDT 2301 are prerequisite or may be taken concurrently.
- 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. CDT 131 to be taken concurrently.
- 137 Basic Drafting Laboratory II 3:0:6**  
This course is a continuation of CDT 136, and concludes with "hands-on" exercises in computer aided drafting. CDT 132 to be taken concurrently.  
Prerequisite: CDT 136.

- 138 Civil-Architectural Drafting Laboratory I** **3:0:6**  
Requires the design of a residence to specifications and preparation of the following for this residence: site plan, foundation plan, preliminary and final floor plan, elevations and schedules. CDT 134 and TM 232 to be taken concurrently.  
*Prerequisite: CDT 137.*
- 139 Civil-Architectural Drafting Laboratory II** **3:0:6**  
Introduces surveying instrument field techniques and calculations. Includes the preparation of the following: contour plan and land survey plan from field notes, an electrical one line diagram and an electrical plan for a residence. CDT 135 to be taken concurrently.  
*Prerequisites: CDT 138 and CDT 2301 or these may be taken concurrently.*
- 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.
- 2300 Beginning Computer Drafting** **3:0:6**  
An introduction to computer usage for non-drafting majors in the production of drawings and layouts for anyone seeking to learn or improve basic drawing abilities. This course will introduce the student to computer drafting, keyboard operations, digitizing existing data and the production of simple drawings.
- 2301 Introduction to Computer Aided Drafting** **3:0:6**  
Introduction to nomenclature, basic software and hardware utilized in computer aided drafting.  
*Prerequisites: CDT 132 and CDT 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. CDT 2331 is to be taken concurrently.  
*Prerequisites: CDT 132, CDT 2301, and TM 232.*
- 2310 Advanced Computer Applications in Drafting** **3:0:6**  
An advanced course in the use of the computer as a drafting and design tool. Designed primarily for graduates or advanced students who have completed CDT 2331 and wish to advance their computer skills. This course will introduce the student to three dimensional drawings, new dimensioning techniques, and production of engineering drawings.  
*Prerequisite: CDT 2331.*
- 2321 Process Pipe Drafting and Design** **3:3:0**  
Includes conventional drafting and computer aided drafting techniques as applied to process pipe nomenclature, plans, elevations, details and process equipment.  
*Prerequisites: CDT 231 and CDT 2331 or these may be taken concurrently.*
- 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: CDT 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.  
*Prerequisites: CDT 2331, CDT 132 and CDT 135 or CDT 232.*
- 2351 Theoretical Application of Computer Aided Drafting to Structural Steel** **3:3:0**  
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.  
*Prerequisites: CDT 2331 and CDT 234, or CDT 234 to be 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. CDT 231 to be taken concurrently.  
*Prerequisite: CDT 137.*



- 2361 Special Topics in Drafting** 3:0:6  
An investigation into specialized areas of general drafting and/or computer aided drafting under the direct guidance of a departmental faculty member. This course may be repeated for credit when topics of investigation differ. Registration for this course requires departmental approval.
- 2371 Pipe Drafting and Computer Design Laboratory** 3:0:6  
The application of computer aided drafting to process pipe drafting and design. Includes pipe symbols, fittings, flow diagrams, vessels, pipe plans and elevations. Industrial equipment and instrument detail are included. CDT 232 is to be taken concurrently.  
*Prerequisites:* CDT 236 and CDT 2331, or may be taken concurrently.
- 238 Structural Design Laboratory** 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. CDT 234 to be taken concurrently.  
*Prerequisites:* CDT 2331, CDT 137 and CDT 139, or CDT 2371.
- 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.  
*Prerequisites:* CDT 2331 and CDT 2351 or 2351 taken concurrently.
- 2661 Special Topics in Drafting** 6:0:12  
An investigation into specialized areas of general drafting and/or computer aided drafting under the direct guidance of a departmental faculty member. This course may be repeated for credit when topics of investigation differ. Registration for this course requires departmental approval.

## Industrial Electronics Technology

**Program Coordinator: William H. Mauer**

Electronic technicians are faced with a veritable maze of semiconductor and micro-processor 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	Second Semester
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	IET 139 Solid State Lab II ..... 3:0:6
Math 1334 (Math Dept) ..... 3:3:0	TM 1334 Electronic Mathematics or
BC 132 Business Communications or	Math 1341 (Math Dept) ..... 3:3:0
Eng 131 (Eng Dept) ..... 3:3:0	
<b>18:12:12</b>	<b>18:12:12</b>

**Third Semester**

IET 231 Digital Logic I .....	3:3:0
IET 232 Digital Logic II .....	3:3:0
IET 236 Digital Logic Lab I .....	3:3:0
IET 237 Digital Logic Lab II .....	3:0:6
BC 231 Technical Writing or Eng 132 (Eng Dept) .....	3:3:0
CS 131 Computer Programming .....	3:3:0
(Computer Science Dept.)	

18:12:12

**Fourth Semester**

IET 2331 Electronic Physics or Phy 141 General Physics Mechanics and Heat (Physics Dept) .....	3:3:0
IET 234 Microprocessor Theory I .....	3:3:0
IET 235 Microprocessor Theory II .....	3:0:6
IET 238 Microprocessor Lab I .....	3:0:6
IET 239 Microprocessor Lab II .....	3:3:0
General Education Elective .....	3:3:0

18:12:12

**Industrial Electronics Technology Courses (IET)**

<b>131 DC Theory and Circuits</b> .....	<b>3:3:0</b>
Electron theory, Ohm's Law, power, simple series and parallel circuits, combined series/parallel circuits, and Kirchhoff's laws.	
Prerequisite: TM 1331 (or equivalent) to be taken concurrently.	
<b>132 AC Theory I</b> .....	<b>3:3:0</b>
Electromagnetism, generation and characteristics of alternating voltage and current, inductance transformers, inductive reactance, capacitance, and capacitive reactance.	
Prerequisite: IET 131.	
<b>133 Basic Electricity</b> .....	<b>3:3:0</b>
Introduction to the field of electricity and electronics.	
<b>134 Solid State Devices I</b> .....	<b>3:3:0</b>
The theory of CE-CB-CC transistor circuits. Oscillators and trouble shooting.	
Prerequisites: IET 132 and TM 1331 (or equivalent).	
<b>1341 Introduction to Digital Logic</b> .....	<b>3:3:0</b>
Number systems, logic family characteristics, and boolean equations.	
Prerequisites: IET 132 and IET 137.	
<b>135 Solid State Devices II</b> .....	<b>3:3:0</b>
The theory of audio and linear circuits. TTL basic logic. N and D, nor gates. Truth tables.	
Prerequisite: IET 134.	
<b>136 DC Laboratory</b> .....	<b>3:0:6</b>
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.	
<b>137 AC Laboratory</b> .....	<b>3:0:6</b>
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.	
<b>138 Solid State Laboratory I</b> .....	<b>3:0:6</b>
CE-CB-CC circuits. Audio and linear circuit oscillators. Transistor testing devices. IET 134 to be taken concurrently.	
Prerequisite: IET 137.	
<b>139 Solid State Laboratory II</b> .....	<b>3:0:6</b>
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.	
<b>231 Digital Logic I</b> .....	<b>3:3:0</b>
The theory of TTL, including timers, readouts, OP AMPS, the use of Truth tables, and the binary number system.	
Prerequisites: IET 135 and IET 1341.	
<b>232 Digital Logic II</b> .....	<b>3:3:0</b>
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.	

- 2331 Electronic Physics** 3:3:0  
A basic study of light, sound and mechanics as they relate to the field of electronics.  
Prerequisites: TM 1334 and IET 139.
- 234 Microprocessor Theory I** 3:3:0  
Development of the computer, numbering systems, logic circuits, arithmetic logic.  
Prerequisites: IET 237 and TM 1334 or equivalent.
- 235 Microprocessor Theory II** 3:3:0  
Theory of memories, computer organization, computer peripherals, programming.  
Prerequisites: IET 234 and IET 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.

## **Division of Public Services**

### **Occupational Technical Programs**

The purpose of Occupational Technical Programs 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 achieved.

Occupational Technical Programs include:

**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.

**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.

The following Courses are offered by the Fire and Safety Institute:

**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.

**Defensive Driving Classes:** National Safety Council approved classes in defensive driving are offered regularly by the Fire and Safety Institute. Successful completion of the eight hour class allows students to receive a reduction in their automotive insurance rates as well as to 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.

**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.

**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.

In addition to the courses listed above, the Fire and Safety Institute offers the following courses on request and at scheduled times:

Crane Safety  
Fork Lift Operator Training  
Fire Brigade Leadership  
Train-the-Trainer  
Hazardous Materials Incident Analysis  
Professional Driver Improvement  
Fire Cause Workshop

### **Lamar Maintenance Institute**

The Lamar Maintenance Institute is in its formative stages. In addition to the courses indicated below, the Institute offers testing for municipal electrical license for persons desiring a master electrician, limited electrician (sign), journeyman electrician or maintenance electrician license. Prior to testing, applicants must meet criteria established by the Southeast Texas Electrical Examining Board. The Institute plans to offer services including pre-employment and progression testing, curriculum writing and skill training for maintenance personnel.

### **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.

### **Real Estate Inspector Series**

This series of three courses contains information pertaining to inspection of residential and commercial property. The courses are approved by the Texas Real Estate Commission and satisfy requirements for licensure examination.

Information concerning Occupational Technical Programs can be obtained from the coordinator. The telephone number of this office is (409) 880-8434 or (409) 880-8207.

## **Lamar University - 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 at Orange 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 - 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.



An industrial electronics technology student converts knowledge into practice in a College of Technical Arts laboratory setting.

# Academic Policies and Procedures

## 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 Records 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. 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 enroll 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" (cum laude), 3.65 to 3.79 for "high honors" (magna cum laude) and 3.80 to 4.00 for "highest honors" (summa cum laude).

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 students. 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

B—Good

C—Satisfactory

D—Passing

F—Failure

I—Incomplete

W—Withdrawn

Q—Course was dropped

S—Credit

U—Unsatisfactory; no credit

NG—No grade

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 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) 30 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 minimum of 15 additional hours, as specified by the department granting the second degree, must be completed at Lamar University.

### **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 forms 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 Records. A student may not drop a course within 15 class days of the beginning of final examinations or five class days before the end of a summer term. Students should check published schedule for specific dates. Students wishing a drop after the official drop date may review with the Dean of the College in which the course is offered.

### **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 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. Students should check the published schedule for specific dates. Students wishing to withdraw after the official withdrawal date may review the issue with the Dean.

### **Enforced Withdrawal Due to illness**

The director of the Health Center and the vice-president for student and university 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 maintain a "C" or 2.0 grade point average. Grade point deficiencies result when the total grade points accumulated are less than twice the number of 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. Students with a grade point deficiency of 25 or more grade points at the end of the Fall, Spring, or Summer shall be suspended.

Academic suspension designates the loss of "good academic standing" and disruption of "satisfactory progress" toward degree completion.

Students suspended from Fall, Spring or Summer semesters by this action may attend the Summer Session on probation. Students with a grade point deficiency less than 25 at the close of the Summer Session will automatically be 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.

Students wishing to return to Lamar University after an absence and who are 25 or more grade points deficient must obtain written permission from the dean of their respective college prior to being accepted for re-admission for either a Fall or Spring Semester.

A college, with the approval of the Provost, 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 at Lamar, 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 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 or who have not met entrance requirements 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 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 semesters 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 Records and Registration 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 class attendance is important to the attainment of the educational objectives of the University. Especially in lower division courses and in large classes at any level, the instructor should keep attendance records and should formulate an attendance policy consistent with departmental policies but suited to the needs of the particular course. The instructor's policy is to be explained in detail to the class at the beginning of the semester.

### **Policy on Student Absences on Religious Holy Days**

In accordance with the Texas Education Code 51.911, a student who is absent from classes in observance of a religious holy day will be permitted to take an examination or complete an assignment scheduled for that day at a time specified by the instructor if not later than the 15th day after the first day of the semester, the student notifies the instructor of each class the student had scheduled on that date that the student would be absent for a religious holy day.

"Religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20, Tax Code.

Notifications of planned absences must be in writing and must be delivered by the student either (a) personally to the instructor of each class, with receipt of the notification acknowledged and dated by the instructor, or (b) by certified mail, return receipt requested, addressed to the instructor of each class. A form, *Notification of Planned Absence for Religious Holy Days*, may be obtained from the Office of Records and Registrar, Wimberly Building, for the purpose of notification. The completed form must be delivered by the student to the instructor of each class affected by the absence. Upon review of the Notification form, instructors will sign and date the receipt of the notice, retaining a copy for the instructor and returning one copy to the student.

Instructors may refer any questions regarding the qualification of the absence to the Vice President for Student and University Affairs. Students may be required to present to the Vice President for Student and University Affairs a written statement documenting that such absence qualifies under the terms of a religious holy day.

### **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 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 Records. Change of address forms are available in the Office of 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 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.

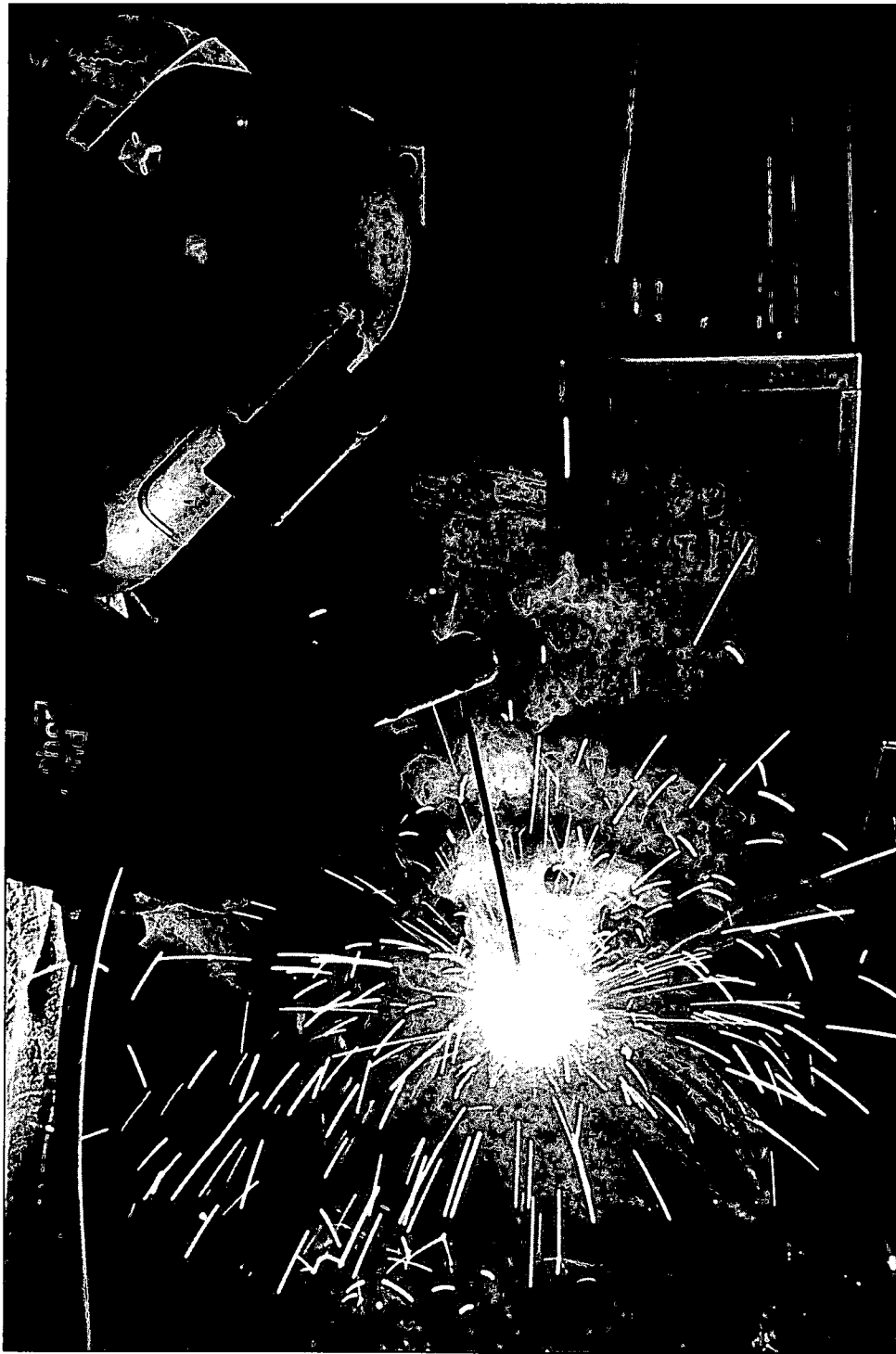
The types, locations and names of custodians of educational records maintained by the University are available from the Dean of Records and Registrar.

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 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; major and minor; semester hour load; classification; participation in officially recognized activities and sports; weight and height of members of athletic teams; dates of attendance; degrees and awards received, with dates; and the last educational agency or institution 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 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.



Experience in Lamar's welding program paves the way for positions utilizing this vital skill in a variety of industrial fields.



## **Student Services**

### **Counseling and Testing Center**

Lamar University maintains a Counseling Center located in 116 Wimberly Student Services Building that offers a full range of services to students. In this central resource location, professional staff are available to provide educational, diagnostic and career testing; instruction for and access to individual computer-assisted career exploration; educational, personal, social, career counseling; and assessment and referral to student development programs including those of Special Services and Learning Skills.

The center is staffed with a licensed psychologist and licensed and certified counselors to assist in the resolution of student problems and questions. The Counseling Center 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 confidential.

In order to assist students in making decisions concerning choices of majors and careers, the Counseling Center maintains two computerized career information systems, SIGI, and Discover, as well as a career library.

The Center coordinates testing required by Lamar University and provides individual testing services for students. These services include the administration and interpretation of career interest and personality tests.

The office also acts as a national test center for administration of Graduate Record Examination, Law School Admission Test, Graduate Management Admission Test, Scholastic Aptitude Test (SAT), American College Testing Program (ACT), College Level Examination Program (CLEP), General Educational Development Test (High School Equivalency Test), the Miller Analogies Test, and the Pre-Professional Skills Test. Information and application forms concerning these tests may be obtained from the Counseling Center.

### **Vocational Assessment Center**

The Lamar Vocational Assessment Center provides individual and group testing, including interest, aptitude, and achievement tests for students who are seeking assistance in choosing appropriate vocational goals. Resume writing, job search techniques, interviewing techniques, and job placement assistance are also provided. These services are available in the Counseling Office complex of the CB Building.

### **Health Center**

The University maintains a Health Center for use by Lamar students. Outpatient service is available for illness or injury that does not require constant supervision.

While it is not possible for the university to provide unlimited medical service, some routine laboratory tests are available at the clinic at a reasonable cost. More extensive laboratory tests and x-rays are available from private physicians if requested by the Health Center Director.

All drugs, splints, special bandages, as well as serums, vaccines, and gamma globulin, which may be prescribed by the Health Center are dispensed at prices equal to the cost assessed the University. Pre-admission vaccinations are not given. Emergency Room or other outside medical care is not the responsibility of the University and is not offered by the Health Center. Any student who has a chronic illness or disability requiring continuing medical attention should make arrangements with a local private physician.

Student Health Center services are available during regular hours when the university is in session.

## **Learning Skills Programs**

The Department of Learning Skills 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. The Center is located in 105 CB.

## **Technical Arts Placement Center**

The Placement Center is a centralized operation responsible for assisting Technical Arts students and graduates with placement in employment. The Center strives to maintain current information on job availability, high employment areas, and employer needs. Materials are provided which pertain to job search techniques, interview skills and resume writing. These services are offered at no cost to the student or graduate.

The Placement Center is located in the Cecil Beeson Technical Arts Building, Room 122.

## **Special Services for Technical Arts**

The Special Services Program for Technical Arts provides counseling for single parents, displaced homemakers, and students enrolled in non-traditional programs. Other services include child care and part-time work experiences while attending classes.

The Special Services Program for Technical Arts also implements programs designed to decrease barriers created by biasing and stereotyping in vocational/occupational education and society. Prospective students are encouraged to call 880-8190 for information regarding enrollment and services. The Special Services Office is located in the Counseling Office within the College of Technical Arts, Cecil Beeson Building, in Room 121.

The Women's Center of Southeast Texas is an educational information and referral service for the citizens of Southeast Texas. This service includes a 24-hour hot-line as a community service. The hot-line number is 832-1100.

Students enrolled at Lamar University who are recognized as economically disadvantaged, veterans, or physically handicapped students are eligible to receive tutoring and participate in the activities of the program.

The program operates in close cooperation with the Counseling Center, the Office of Student Development, and the Director of Learning Skills.

## **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, non-credit 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 Center provides facilities for leisure-time recreation and is the campus center for many extracurricular activities. The Center includes an information center, two games areas, TV Rooms, check cashing/ticket sales, locker rental, music listening room, snack bar, graphics operations, reservations office, video lounge, a ballroom, a reading room, various meeting rooms and lounges, and The Redbird Perch, a pizza parlor and delicatessen operation. The Center houses the office of the Setzer Student Center Council, Student Government Association, Student Organizations, Alpha Phi Omega, Student Publications and various staff members who work with these organizations and many others. Commercial businesses housed in the Center include the Lamar University Bookstore, the Roost Ice Cream Shop and a campus hair styling shop.

## **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 comprises 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 175 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 22 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 interrelationships 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 campus student newspaper published twice a week during the long semesters.

The *University Press*, with offices at 200 Setzer Student Center, serves as a training opportunity for students interested in journalism.

The *Student Telephone Directory* — containing a listing of the names, addresses and telephone numbers of students, faculty and administrators — is published each fall under the auspices of the Setzer Student Center and the University Press. It is distributed by the Setzer Student Center. Students should contact the Office of Admissions and Records to complete a form if they wish not to be listed in the *Student Telephone Directory*.

## **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 and 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 chief student affairs officer or his designated representative will take appropriate action.

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.

## **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 chief student affairs officer 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 Students Services.

## **Parking Regulations**

Each student who pays the necessary fee is issued a vehicle card that permits parking on the campus. This card 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 an educational environment. A variety of living styles 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 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.

## **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 \$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**

The Lamar University Alumni Association, 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 on Redbird Lane.

## **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 a 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 Dual Honeywell DPS8/49 computer with 1536K 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 53 synchronous and 134 asynchronous terminals to the computer concurrently. A remote job entry station with one card reader and one printer is located in the Beeson Technical Arts Building. This station also has a Honeywell Level 6 computer tied in with the main frame computer.

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. Keypunches 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 programming languages supported by the Honeywell computer include: BASIC, FORTRAN, COBOL, PASCAL, ALGOL, LISP, SNOBOL, and APL.

The Computer Science Department has a Digital Equipment Corporation VAX-11/750 computer. There are 1.5 megabytes of main memory, one tape drive, one disk drive and one printer attached to the VAX-11/750. At present, this system can support sixteen asynchronous terminals.

## **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 a fully computerized system providing open access to 800,000 volumes. Seating accommodates 1,200 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.

### **Montagne Center**

The 10,000-seat Montagne Center, home of the Lamar University basketball team, is a multi-purpose facility that provides opportunities for educational and extra-curricular programs. The center houses the athletic offices, center staff, University ticket office, and continuing education programs.

### **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.





These skilled hands exemplify the creative, scientific approach to problem-solving that the College of Technical Arts instills in its students.

## Directory of Personnel 1987-88

### Board of Regents

H. D. Pate, Chairman .....	Bridge City
Thomas M. Maes II, Vice Chairman .....	Beaumont
Joseph D. Deshotel, Secretary .....	Beaumont
Otho Plummer, Chairman Emeritus .....	Beaumont
Lloyd Hayes, Chairman Emeritus .....	Port Arthur
Truman Arnold .....	Texarkana
Donna Davis .....	Bryan
George A. Dishman .....	Beaumont
Wayne Reaud .....	Beaumont

### Administration

McLaughlin, George E., Ed.D., Chancellor  
 Baxley, Oscar K., M.B.A., Vice Chancellor for Finance  
 Leonard, W. S., M.S., Vice Chancellor for Development  
 Franklin, Billy J., Ph.D., President, Lamar University-Beaumont; Chief Academic Officer, Lamar University System  
 Nylin, William C., Ph.D., Executive Vice President for Finance and Operations  
 Johnson, Andrew J., Ph.D., Vice President for Student and University Affairs  
 Brickhouse, J. Earl, B.S., Executive Director for Public Affairs  
 Wooster, Ralph A., Associate Vice President for Academic Affairs and Dean of Faculties  
 Monroe, W. Sam, L.L.D., President, Lamar University-Port Arthur  
 Welch, Joe Ben, Ph.D., President, Lamar University-Orange  
 Breaux, Merlin, B.S., President, John Gray Institute

### Council of Deans

Bell, Myrtle L., Ed.D., Dean, College of Health and Behavioral Sciences  
 Brentlinger, W. Brock, Ph.D., Dean, College of Fine Arts and Communications  
 Idoux, John, Ph.D., Dean, College of Arts and Sciences  
 Johnston, Maxine, M.L.S., Director of Library Services  
 McCabe, Dennis P., Ph.D., Dean, College of Education  
 Rode, Elmer G., Jr., M.Ed., Dean of Records and Registrar  
 Shipper, Kenneth E., Ph.D., Dean, College of Technical Arts  
 Sullivan, LeRoy, Ed.D., Director of Public Services  
 Turco, Charles P., Ph.D., Dean of Graduate Studies and Research  
 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 September 1986. 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 Computer 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 IV 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
- Chappell, Dana L.**, 1985, Instructor I of Child Care Technology  
B.S. Ed., University of Pennsylvania; M.S. Ed., Duquesne University
- Darbonne, Robert V.**, 1985, Adjunct Instructor of Instrumentation
- Dimick, Roger L.**, 1985, Instructor I of Business Data Processing  
B.B.A., Lamar University
- Durgin, Thomas R.**, 1980 Instructor II of Industrial Electronics Technology  
A.A.S., Lamar University
- Essien, Edet T.**, 1984, Adjunct Instructor of Plant Maintenance  
B.S., M.S., Lamar University
- Frederick, Maurice, Jr.**, 1982, Instructor II of Refrigeration and Air Conditioning Technology
- Fitzpatrick, James E.**, 1982, Instructor I of Industrial Electronics Technology  
A.A.S., B.S., Lamar University
- Gardner, Kathryn A.**, 1979, Instructor II of Business Data Processing  
B.B.A., Lamar University
- Gaskin, Joyce H.**, 1986, Instructor I of Child Care Technology  
B.S., University of Tennessee; M.S., University of Pittsburgh; M.A., Lamar University.
- Green, Marcia L.**, 1972, Instructor IV of Related Arts  
B.A., Bishop College; M.A., Stephen F. Austin State University; M.Ed., Lamar University; Ph.D., Texas Woman's University
- Grubbs, Donald R.**, 1974, Instructor III of Welding  
B.S., Lamar University
- Harris, Robert M.**, 1979, Instructor II of Machine Tools  
A.A.S., Lamar University
- Jones, Bonner R.**, 1982, Instructor II of Electrical 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
- Kriegel, Otto A.**, 1973, Instructor III of Machine Tools
- Lovelady, Victor L.**, 1985, Instructor I of Electrical Technology  
A.A.S., B.S., Lamar University
- 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 II of Diesel Mechanics  
A.A.S., Lamar University
- Mathis, Verbie T.**, 1978, Instructor II of Industrial Supervision  
B.S., Texas Eastern University; M.B.E., Stephen F. Austin State University
- Mauer, William H.**, 1980, Instructor II and Program Coordinator of Industrial Electronics Technology  
A.A.S., Lamar University
- Mock, Ralph K., Jr.**, 1966, Instructor IV and Program Coordinator of Computer Drafting Technology  
Senior Certified Engineering Technician  
A.A.S., Lamar University

- Musselwhite, John C.**, 1982, *Instructor I of Industrial Electronics Technology*  
**Neissingh, Christian C. Jr.**, 1982, *Instructor II of Diesel Mechanics*  
 A.A.S., Lamar University, B.S., New York State University at A Oswego
- Nelson, Floyd A.**, 1985, *Instructor I of Instrumentation*
- Nevils, Kerry I.**, 1981, *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
- Roy, M. Paul**, 1963, *Instructor IV of Machine Tools; Placement Coordinator*  
 A.A.S., Lamar University
- Schroder, John P.**, 1983, *Instructor I of Computer Drafting Technology*  
 B.S., Southwestern Louisiana Institute
- Shipper, Kenneth E.**, 1971, *Dean, College of Technical Arts; Instructor IV of Related Arts*  
 B.S., Sam Houston State University; M.A., Ph.D., The University of Texas at Austin.
- Smith, James D.**, 1986, *Instructor I of Industrial Electronics Technology*  
 A.S., B.S., McNeese State University
- 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*
- Walker, Delia A.**, 1979, *Instructor II of Computer Drafting Technology*  
 A.A.S., Lamar University
- Wesley, Carey B.**, 1966, *Instructor IV of Welding; Head, Industrial Department*  
 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*
- Wilsker, Ira L.**, 1977, *Instructor II of Mid-Management*  
 S.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**

- Birch, Philo H.** 1986, *Adjunct Instructor of Occupational Safety and Health*  
 A.A., Concordia Junior College; B.S.M.E., Purdue University
- Bond, Deborah K.**, 1986, *Adjunct Instructor of Business Data Processing*  
 B.B.A., Lamar University
- Bonura, Lawrence**, 1986, *Adjunct Instructor of Industrial Supervision*  
 B.S. M.E., Lamar University
- Cater, Otis E. III**, 1978, *Adjunct Instructor of Real Estate*  
 B.S., M. Ed., Lamar University
- Clark, Timothy P.**, 1986, *Adjunct Instructor of Industrial Electronics Technology*  
 B.A., University of Kentucky
- Clark, William V.**, 1986, *Adjunct Instructor of Industrial Electronics Technology*  
 B.S.F.E., Purdue University
- Collins, Donna M.**, 1986, *Adjunct Instructor of Real Estate*  
 A.A.S., Lamar University

- Creekmore, Terry J.**, 1985, Adjunct Instructor of Business Data Processing  
A.A.S., Lamar University
- Crowley, Daniel W.**, 1986, Adjunct Instructor of Instrumentation Technology
- Delafosse, Graland J.**, 1986, Adjunct Instructor of Industrial Electronics Technology  
A.A.S., Lamar University
- Faraci, Dominick A., Jr.**, 1985, Adjunct Instructor of Refrigeration and Air Conditioning Technology  
A.A.S., Lamar University
- Franks, Wanda G.**, 1978, Adjunct Instructor of Related Arts  
B.S., M.Ed., Lamar University
- Gray, Nancy T.**, 1981, Adjunct Instructor of Related Arts  
B.A., Lamar University
- Green, Ina J.**, 1984, Adjunct Instructor of Related Arts  
B.S., M.Ed., 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
- Hebert, Roland S.**, 1985, Adjunct Instructor of Occupational Safety and Health  
B.S., Lamar University
- Hedgseph, Joe M.**, 1981, Adjunct Instructor of Appliance Repair
- Hurlbut, Brian**, 1982, Adjunct Instructor of Business Data Processing  
B.S., Iowa State University, M.S., San Diego State University, M.B.A., University of Houston
- King, Sidney A.**, 1981, Adjunct Instructor of Real Estate  
L.L.B., Baylor University
- McCall, Morris D.**, 1985, Adjunct Instructor of Mid-Management  
B.B.A., S.F. Austin University, L.L.B., University of Texas
- 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
- Owen, George G.**, 1982, Adjunct Instructor of Real Estate  
B.A., Lamar University
- Peters, William F.**, 1986, Adjunct Instructor of Occupational Safety and Health  
C.C., Mountain View College
- Shanks, James E., Jr.**, 1977, Adjunct Instructor of Related Arts  
B.S., Lamar University
- Smith, Albert E.**, 1976, Adjunct Instructor of Related Arts  
B.S., M.Ed., Stephen F. Austin State University
- Stidham, Mary L.**, 1981, Adjunct Instructor of Related Arts  
B.A., M.A., Lamar University
- Tyson, Candy A.**, 1986, Adjunct Instructor of Business Data Processing  
B.S., Lamar University
- Wilson, Samuel H., Jr.**, 1986, Adjunct Instructor of Electrical Technology
- Woods, Anita J.**, 1971, Adjunct Instructor of Related Arts  
B.A., Sam Houston State University

### **Beaumont Campus Administrative Staff:**

**Kenneth E. Shipper**, Dean  
**Norman E. Lowrey**, Supervisor of Adult Training  
**Harry L. Williams**, Vocational Counselor  
**Nancy Davis**, Coordinator of Special Services  
**M. Paul Roy**, Placement Coordinator  
**Dixie Collier**, Coordinator of Handicapped Services  
**Gerald Braquet**, Technician, Technical Department  
**D.J. Leger**, Technician, Industrial Department  
**Richard Neumann**, Director of Assessment  
**Lynette Cardwell**, Secretary to the Dean  
**Etta Helveston**, Secretary to the Vocational Counselor  
**Myrna Manuel**, Secretary for the Adult Training and Industrial Departments  
**Joy Tate**, Secretary for the Related and Technical Arts Departments

### **Division of Public Services Occupational Technical Programs**

**Norman E. Lowrey**, Coordinator and Director of Fire and Safety Institute  
**Joseph C. Willey**, Assistant Director of the Fire and Safety Institute  
**Ezra Gordon**, Instructor of Fire Training  
**Scott Kerwood**, Instructor of Fire Training  
**Martha Boudreaux**, Word Processor  
**Paul Hanten**, Adjunct Instructor of Transportation Safety

### **Police Academy**

**Gary Duncan**, Director  
**Linda Cone**, Secretary

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A statue of Mirabeau B. Lamar, the "Father of Education" in Texas and whose name Lamar University honors, adorns the quadrangle of the Beaumont campus.

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