STATE TECHNICAL INSTITUTE AT KNOXVILLE

Established as a state institution on September 9, 1974, State Technical Institute at Knoxville operates under the Tennessee State Board for Vocational Education through the Tennessee State Department of Education, Division of Vocational-Technical Education.

P.O. Box 19802
3435 Division Street
Knoxville, Tennessee 37919
(615) 637-4262

State Technical Institute at Knoxville is an Equal Opportunity-Affirmative Action employer and does not discriminate on the basis of age, race, color, religion, sex, handicap, or national origin in the admission to, or participation in, any educational program or activity which it conducts, or discriminate on such basis in any employment opportunity. Any complaint arising by reason of alleged discrimination shall be directed in writing to Dr. Wayne Jones, State Technical Institute at Knoxville, P. O. Box 19802, Knoxville, Tennessee 37919.
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**CHANGE IN REGULATION**

Announcements contained within the catalog are subject to change at the discretion of the college. Any changes will be posted around the institution. An attempt will be made, however, to keep changes at a minimum.
### SUMMER 1978

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<td>July 5</td>
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<td>Classes Meet as Scheduled</td>
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<td>Last Day to Register, Last Day to Add Classes</td>
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### FALL 1978

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<th>Event</th>
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<td>Last Day to Register, Last Day to Add Classes</td>
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<td>Last Day to Drop Classes</td>
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<td>Last Day to Withdraw</td>
<td>November 7</td>
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<td>Thanksgiving Holidays</td>
<td>November 23-24</td>
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<td>Preregistration for Winter Quarter</td>
<td>November 28-December 1</td>
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<td>Final Examinations</td>
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### WINTER 1979

<table>
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<td>Advisement and Registration</td>
<td>January 2</td>
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<td>Classes Meet as Scheduled</td>
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<tr>
<td>Last Day to Register, Last Day to Add Classes</td>
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<td>Last Day to Drop Classes</td>
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Last Day to Withdraw
Preregistration for Spring Quarter
Final Examinations
Spring Recess

February 13
February 27-March 2
March 14-16
March 17-25

SPRING 1979
Advisement and Registration
Classes Meet as Scheduled
Last Day to Register, Last Day to Add Classes
Holiday, Good Friday
Last Day to Drop Classes
Last Day to Withdraw
Preregistration for Summer and Fall Quarters
Final Examinations
Commencement

March 26
March 27
April 6
April 13
April 16
May 7
May 22-25
June 6-8
June 10

SUMMER 1979
Advisement and Registration
Classes Meet as Scheduled
Holiday, Independence Day
Last Day to Register, Last Day to Add Classes
Last Day to Drop Classes
Last Day to Withdraw
Holiday, Labor Day
Final Examinations

July 2
July 3
July 4
July 13
July 23
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FALL 1979
Orientation — New Students
Advisement and Registration
Classes Meet as Scheduled
Last Day to Register, Last Day to Add Classes
Last Day to Drop Classes
Last Day to Withdraw
Thanksgiving Holidays
Preregistration for Winter Quarter
Final Examinations
Christmas Holidays

September 20-21
September 24-25
September 26
October 5
October 16
November 6
November 22-23
November 27-30
December 5-7
December 8-28
The purpose of the State Technical Institute at Knoxville is:

To serve the people of East Tennessee by:

Providing classroom and laboratory instruction (in one and two-year programs), to prepare adults for employment as technicians, and

Provide training to increase the competence of employed adults so that they may become technicians or move to a higher level of responsibility.

To serve business, industry and government in East Tennessee by:

Providing technicians for employers and training to increase the competence of employees, and

Providing technician training to attract business and industry to East Tennessee and to encourage business and industry now located in this region to expand.

Services to the people of East Tennessee and services to business, industry and government are compatible, because:

The people of East Tennessee may obtain positions as technicians at good salaries. State Tech's record for placing graduates in jobs for which they are prepared is almost 100 percent, and

Business, industry and government will have available the technicians essential for their operations.
Approved by the Tennessee State Board for Vocational Education, State Technical Institute at Knoxville is granted the privilege of awarding the Associate of Engineering degree, Associate of Science degree, and certificates.

State Technical Institute at Knoxville is accredited by the Southern Association of Colleges and Schools Commission on Colleges, which is the regionally-recognized accrediting organization.

State Tech is approved under the appropriate laws governing the Veterans Administration to offer training for veterans and other eligible persons. Also, Federal Law authorizes State Tech to enroll nonimmigrant alien persons.

State Tech is an official member of the following organizations:

American Association of Community and Junior Colleges
American Society for Engineering Education
Greater Knoxville Chamber of Commerce
National Association of College and University Business Officers
Society for the Advancement of Management
Southern College Placement Association
Tennessee College Association
Tennessee Valley Personnel Association
The technician is a qualified specialist who applies scientific and engineering knowledge in business, industry, or government. Often having the responsibility of converting an idea or theory into a workable model, the technician fills the gap between the engineer and the craftsman or between the business manager and the computer. As a technician, he must be able to understand and speak the language of both the engineer or manager and the craftsman or computer. The technician who has the ability to combine theory and application serves a special and necessary function in our advancing technology.
GENERAL INFORMATION
Admissions
ENTRANCE REQUIREMENTS

A person applying for admission to associate degree programs at State Technical Institute at Knoxville must be a high school graduate or have an equivalency diploma (GED). Admission to special courses and certificate programs is open to adults who meet requirements for specific programs.

It is recommended that individuals who have not previously earned satisfactory college-level credits submit scores from the American College Testing (ACT) examination.

The Institute will provide opportunities for education to all qualified applicants without regard to race, sex, color, religion, national origin, age, or handicap.

APPLICATION

All applicants must submit a completed application and medical form. Forms are available in the Student Services Office. Applicants must also submit a high school transcript or a copy of GED scores and transcripts of any previous college work.

Degree Students

Applicants for the associate degree programs should complete and submit the following.
1. Student application for admission. Application forms may be obtained from the Admissions Office.
2. Transcript of high school work.
3. Satisfactory General Educational Development (GED) test scores, if applicant did not graduate from high school.
4. Official transcripts from other colleges or universities attended.

Certificate Students

Applicants for certificates should complete and submit a student application. Application forms may be obtained from the Admissions Office.

Transfer Students

Applicants transferring from other colleges or universities must present valid transcripts from each school during their first quarter at State Tech.
Veterans must have transcripts from all colleges and universities attended for V. A. certification.

As a rule, applicants eligible for readmission to the institution from which they are transferring are also eligible for admission to State Tech.
Transfer credits are evaluated (see page 24 for details on Transfer Credit), if they can be related to the student's field of study. Credit will be given for work taken at accredited institutions. No credit will be given unless a grade of C or
above was received.

Armed forces education experience will be evaluated according to guidelines of the American Council on Education. The Institute will require verification from official military records.

Registration and Orientation

All prospective students completing application procedures are required to register on the dates shown on the academic calendar and to attend an orientation period during the week prior to registration. All freshmen will be notified of orientation.
Fees for the State Technical Institute at Knoxville are determined by the State Board of Education and are subject to change without notice.

Quarterly Fees

Full-time students (registered for twelve hours or more) are charged $65.00 maintenance fee per quarter. Part-time students (registered for fewer than twelve hours) will pay $6.50 per quarter hour maintenance fee. All fees must be satisfied before registration is complete. Financial aid arrangements must be made and authorizations must be on file in the Business Office before registration day.

Late Fees

A late fee of 10 percent of the maintenance fee will be charged for any registration occurring after the official registration date published in the academic calendar. A late fee will not be charged for special and contract courses.

Returned Check Fee

A fee of $5.00 will be charged for each check returned by the bank for any reason.

Transcript Fee

A student may have one free copy of his/her transcript. Each additional copy will cost the student $1.00 excepting those which will be provided free to employers and schools.

Refund Policy

State Tech will refund a portion of the maintenance fee to any student who officially drops or withdraws or is dismissed from a course(s), computed as follows.

1. Curricula Courses

If drop or withdrawal occurs within 1 through 15 calendar days from the official registration date, the refund is 75 percent.

If drop or withdrawal occurs within 16 through 30 calendar days from the official registration date, the refund is 30 percent.

If drop or withdrawal occurs 31 or more calendar days after official registration, there is no refund.

2. Special and Contract Courses

If withdrawal occurs, the refund is the pro rata part of the course hours not attended based on the ratio of hours left after the date of withdrawal to the total hours available for the course.

The student will receive a full refund if a drop or withdrawal occurs before close of official registration or if class is cancelled or changed due to administrative decisions.

Any amount due the Institute must be satisfied before the refund is made to the student. Where applicable, the refund will be made to the organization or fund paying the maintenance fee.
Administrative Dismissal

Students may be administratively dismissed from State Tech if they fail to satisfy the approved fees of the Institute after due process of collection has failed to produce results.

A collection process will not be used for the non-interest student maintenance fee loan. The administrative dismissal will be automatic on the first working day following the due date of the note. Exceptions to this policy must be approved by the President before the due date.

All students administratively dismissed must satisfy all fees and secure the written approval of the President before readmission to State Tech.

Financial Aid

Numerous sources of financial aid are available through State Tech and other agencies for qualified students. Among the available sources of funds are the following:

Basic Educational Opportunity Grant: This federally funded grant is to be used as a basis for other grant programs. Applications can be obtained from high school counselors, financial aid counselors, or from Basic Grants, P.O. Box G, Iowa City, Iowa 52240.

Guaranteed Student Loan: This is a low-interest loan plan that the student obtains through a bank or other lending agencies. As long as a student is at least part-time and in school, there is no accumulating interest. Applications may be obtained through the lender and must be accompanied by a letter from State Technical Institute at Knoxville.

State Board Work Scholarship: State Board Work Scholarships are available to students who are residents of Tennessee and who were in the top half of their high school graduating class. The recipient must fulfill a minimum work obligation and maintain a 2.5 GPA to be eligible for the scholarship. This scholarship covers tuition only.

Optimist Club Scholarship: A limited number of scholarships which cover tuition only are available. Applications are available from the Financial Aid Counselor.

Assistance: Assistance is available under Social Security, Veterans Administration, and Vocational Rehabilitation. Students should contact the Financial Aid Counselor to apply.

College Work Study: This federally funded program provides part-time employment for students. To participate, a student must be a full-time student and demonstrate financial need.

Supplemental Educational Opportunity Grant: Under this program Federal grants provide financial assistance to high school graduates who demonstrate exceptional financial need to enable them to attend college.
Financial Aid for Engineering Technology Majors:
The Tennessee Valley Authority is offering financial aid up to the maximum of $125.00 per quarter which may be used for tuition, books and supplies. To be eligible to apply, a student must be majoring in construction, electronic, or mechanical engineering technology. Students interested in this program should contact the Admissions Office at 637-4262.

Robert C. Hopkins Scholarship Fund is presented by the Oak Ridge-Knoxville Chapter of the American Society of Certified Engineering Technicians (ASCET). The recipient is chosen by the Oak Ridge-Knoxville Chapter of ASCET.

Robertshaw Scholarships. The recipients will be chosen by the Robertshaw Controls Company.

Students interested in financial aid should follow the procedures below:

1. File an application for admission to State Tech.
2. File an application for Basic Educational Opportunity Grant.
3. File a Family Financial Statement with the American College Testing Program (ACT) Student Assistance Programs, 2201 North Dodge, P. O. Box 1000, Iowa City, Iowa 52240.
4. File an application for financial aid with the Financial Aid Counselor.

Contact the Financial Aid Counselor for further information about any programs.
Student Advising

At the time of initial enrollment each student will be assigned a faculty advisor by each curriculum department head. The advisor's function is to assist with all academic considerations such as:

The technology in which the student will probably succeed on the basis of his aptitude and experience;

The quarter hours of work which the student should carry;

The sequence of courses in a student's total academic program and the schedule of courses for a quarter; and

Any special academic questions or problems which should not be handled by the faculty member teaching the course.

Pre-Registration

Normally a one-week pre-registration period is provided each quarter. Two evenings are provided to the evening students for this same purpose.

Students pick up the next quarter's schedule, registration packets, and instruction sheets from the Admissions and Records Office and receive their advisor's approval of their following quarter's schedule.

Students may pay the maintenance fee and complete all registration requirements during pre-registration week. Students who do not pay during the pre-registration week have until the registration period of the quarter for which they are pre-registering to pay. A student will not be officially enrolled until fees have been paid and a receipt has been issued by the Business Office. If tuition is being paid by an outside source, a student must still go to the Business Office to get a receipt to be officially enrolled.

Procedures for Adding, Dropping, and Withdrawal

Adding a class: The last day to add classes is set by the academic calendar and is generally eight school days after the last day of official registration and coincides with the last day for late registration.

Dropping a class: Twenty-one calendar days are normally provided between official registration and the last day to drop classes as listed in the academic calendar.

When a student completes the drop process for a class or classes on or before the last day to drop, he receives no grade, and his name is dropped from the class roster.

Withdrawal: Withdrawal is defined as withdrawing from one or more courses after the last day to drop. Withdrawal from a course or from the Institute will result in the course or courses being placed
on the transcript and a grade of "W" being recorded to reflect withdrawal from the course. The grade of "W" will be granted up to the sixth week in the quarter.

**General Note**

Any student still on the roster who is not attending class and who did not officially drop or withdraw from a class is to receive a mark of "F."

**Summary of Procedures for Adding, Dropping, and Withdrawal**

<table>
<thead>
<tr>
<th>ACTION</th>
<th>TIME</th>
<th>WHO INITIATES</th>
<th>APPROVAL CHAIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add Class</td>
<td>Through last day to add</td>
<td>Student</td>
<td>1. Advisor</td>
</tr>
<tr>
<td>Drop Class</td>
<td>Through last day to drop</td>
<td>Student</td>
<td>1. Advisor 2. Instructor</td>
</tr>
<tr>
<td>Withdraw</td>
<td>Through last day to withdraw</td>
<td>Student</td>
<td>1. Advisor 2. Instructor</td>
</tr>
</tbody>
</table>
GENERAL INFORMATION

Requirements for an Associate Degree
The individual student is responsible for seeing that all requirements for graduation are met. Any exception to the requirements must be approved by the President. As a candidate for the Associate of Engineering degree or Associate of Science degree, the student must satisfy the following requirements for graduation:

Minimum residence: The last 30 credit hours preceding graduation must be completed at State Technical Institute at Knoxville.

Minimum credit hours: Each candidate must complete at least 90 credit hours to be eligible for the associate degree.

Minimum grade point average: A cumulative grade point average of at least 2.0 on all course work at State Tech is required for graduation.

Major studies: Completion of the curriculum for the major subject chosen is required for graduation.

Degree application: Each prospective candidate must file an Intent to Graduate Form at least one quarter prior to the quarter he expects to graduate. Forms may be obtained in the Admissions and Records Office.

Catalog option: The student must meet the requirements of: (a) the current catalog, or (b) the catalog effective at the time she entered a program, provided graduation is within six years from the entrance date. This option does not exempt anyone from the general requirements of State Tech. General requirements are subject to change without notice when new requirements are necessary for a quality program. Credits earned earlier than six years prior to graduation will be subject to review and evaluation by the Dean of Instruction.

Commencement: All students are required to participate in a formal graduation ceremony.
General Policy

Interpretation of Letter Grades: A technical grade will be given in each course. The technical grade will report the student's progress and achievement in the following:

A. Knowledge of the subject;
B. Ability to apply this knowledge; and
C. Work habits and practices.

Technical grades will be awarded on the four-point system as follows:

<table>
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<tr>
<th>Grade</th>
<th>Quality Points</th>
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<tbody>
<tr>
<td>A Excellent</td>
<td>4 per quarter hour</td>
</tr>
<tr>
<td>B Above Average</td>
<td>3 per quarter hour</td>
</tr>
<tr>
<td>C Average</td>
<td>2 per quarter hour</td>
</tr>
<tr>
<td>D Below Average</td>
<td>1 per quarter hour</td>
</tr>
<tr>
<td>F Failure</td>
<td>0 per quarter hour</td>
</tr>
<tr>
<td>W Withdrawal</td>
<td>not computed, no credit</td>
</tr>
<tr>
<td>I Incomplete</td>
<td>not computed, no credit</td>
</tr>
<tr>
<td>P Passing</td>
<td>not computed, receive credit</td>
</tr>
<tr>
<td>AU Audit</td>
<td>not computed, no credit</td>
</tr>
</tbody>
</table>

Notes:
1. The only school-wide grading policy is that no final exam will count more than 50 percent of a student's final grade.
2. Grades of W, I, P, and AU do not affect grade point average.

Audit: A student may enroll in classes on a non-credit basis as an auditor. He is expected to attend class but does not receive a grade. A student can change from audit to credit or from credit to audit only
during the period when it is possible to add a course. No changes are permitted after this time. The auditor must inform the Registrar he is taking the class as an audit.

Policy on Incompletes: The grade of "I" does not count as hours attempted in determining the grade point average for the quarter the student receives the "I." Instead, the grade replacing the "I" is computed into the grade point average at the end of the subsequent quarter. A grade of "I" must be made up by the end of the subsequent quarter or it reverts to an "F." The instructor, however, has the prerogative to limit the time allowed for completion to less than one quarter.

REPETITION OF COURSES

Students are responsible for repeating courses failed. The most recent grade will be used for computing Grade Point Average. Courses may be repeated as often as the student feels necessary.

GRADE REPORTS

Reporting of Final Grades

If a student's name appears on the final roster and the student has not been attending class, the student is still enrolled for the course and will receive a grade.

STUDENT CLASS ABSENCES

Students are expected to attend all classes each time the class meets. When it becomes necessary for a student to be absent from a class, courtesy requires an explanation to the instructor in charge.
At the discretion of the instructor, excessive absences may affect the student’s overall quarter grade.

ACADEMIC PROBATION AND SUSPENSION

Probation
A student will be placed on probation at the end of any quarter in which he fails to maintain any of the following:

First Quarter of Attendance
Grade Point Average 1.50
Second Quarter of Attendance
Grade Point Average 1.75
All Subsequent Quarters of Attendance
Grade Point Average 2.00

Probation will be removed once the student meets the grade point average required for non-probation status for that quarter of attendance.

Suspension
A student who falls under the probation category for two successive quarters is subject to suspension. The first occurrence will subject the student to a one-quarter suspension. The second occurrence will subject the student to a one-year suspension.

All requests for readmission from academic suspension submitted to the Dean of Instruction will be reviewed and acted upon by the Academic Standards Committee. This committee will consist of the Dean of Instruction as chairman, the student’s department head, two instructors who
have taught the student, the Head of Student Services, and a Student Government representative.

COLLEGE TRANSFER CREDIT

Upon receipt of a college transcript, the Admissions and Records Office and the respective divisions will evaluate the courses taken. Transfer credit is awarded for those individual courses which are determined to be comparable to those offered at the State Technical Institute at Knoxville, provided a grade of "C" or better was made in the course. No credit is awarded for transfer courses containing less than 75 percent of the credit hours associated with the State Tech equivalent of the same course. Transferred credit will not be computed in a student's GPA at State Tech.

Students who have completed prior college work and who desire that it be considered for transfer credit should contact their former institution and ask that a transcript of grades be forwarded to the State Tech Admissions and Records Office. Transfer credit must be approved during a student's first quarter of attendance at State Tech.

WAIVERS, INDEPENDENT STUDY
AND CREDIT BY EXAMINATION

Waiver of a Prerequisite

Under special circumstances a prerequisite to a course may be waived by the head of the department in which the course is offered. This is done only when it is felt that the student has a fundamental knowledge of the prerequisite course and his progress in the course requiring the prerequisite would not be impeded by not having had the prerequisite course.

The waiver of prerequisite is not to be confused with a course waiver. If
the prerequisite waived is a course required in the student’s curriculum, it must be completed or substituted (as below) before he receives the associate degree. No fee is required for a waiver of prerequisite.

Course Waiver and Substitution

Under special circumstances a course may be waived by the Head of the Department. This is done in instances where a course deletion or curriculum change necessitates the waiver. A course of equal or greater credit must be substituted and taken in lieu of any course waived. This stipulation in no way reduces the minimum quarter hours required for the associate degree. The substitute should be of the same or higher level as the course being waived. Primary consideration must be given to selecting a substitute course from the same department as the course waived.

No fee is required for a course waiver and substitution. A course waiver and substitution does not reduce the total credit hours or number of courses required for the associate degree. Likewise, no credit is awarded for a course waiver.

Independent Study

Registration for a course on an independent study basis and subsequent granting of credit may be accomplished for students who can prove to the satisfaction of the faculty of the Institute that they have the capability of mastering the content of an independent study course.

Permission to pursue a course on an independent study basis will be given only in instances where the student can demonstrate the ability to pursue the course through independent study and there is reasonable expectation that he can successfully complete the course. Permission to register for such a course must be granted by both the student’s advisor and the course department head. A fee of $6.50 per credit hour (non-refundable) must be
paid to the Business Office for each course in which the student is enrolled on an independent study basis. The total student maintenance fee, however, cannot exceed $65 per quarter (or the current maximum). Students are given up to six months from the date of fee payment to complete the course, including the examining process.

Examination(s) will be given by the instructor offering the independent study course as the student progresses through the assigned material. It will be the student’s responsibility to meet with the instructor to arrange these examinations so that the course material is completed within the six-month period.

If the course is passed by independent study, the student is awarded full course credit. If the course is failed, the student may not subsequently request another independent study of that course.

Credit by Examination

A student may challenge any course offered at State Tech on the basis of past experience or training. Application for Credit by Examination must be approved by the Department Head.

The examination criteria will be determined by the Department Head and will normally consist of a comprehensive written test followed by an oral test. A laboratory exam may be given when necessary.

Credit by Examination will be given on a pass-fail basis only and will not be computed in the student’s grade point average. A student will not attempt an examination for any course more than once.

A student may apply for Credit by Examination for no more than two courses at any given time. Credit by examination is counted as part of a student’s load. The load of courses taken and courses in which one is seeking Credit by Examination may not exceed the maximum load which is allowed at any one time.
EDUCATIONAL RESOURCE CENTER

“Service is our most important product,” says the advertising slogan of one company. It could also be the slogan of the Educational Resource Center (ERC) because the main reason for its existence is to serve the informational needs of the students and faculty at State Tech. In its collection of books, periodicals, microfilm, audio-visual equipment, and materials, the E. R. C. supports the various State Tech curricula and provides recreational reading. Periodicals, an important part of the library’s collection, contain the most up-to-date information for new applications and advances in the technologies. The library also has a typewriter available for student use.

Audio-visual equipment is available in the Media Center of the ERC. In the development of instructional materials, the Media Center works hand-in-hand with institutional personnel by advising and consulting them in the various techniques for presenting instructional materials. Audio-visual assistance is also available to students upon request.

BOOKSTORE

Located in the student lounge, the bookstore is designed to serve the students, faculty and staff. The essential textbooks and supplies for each course offered at State Tech can be purchased in the bookstore. Class rings, State Tech jackets, calculators, personal items, and many accessories are also available for purchase.

STUDENT SERVICES

State Technical Institute at Knoxville is aware that State Tech creates a new challenge for students. The Student Services Division at State Tech, responsible for assisting all students in meeting these challenges and providing the maximum development of each student, offers a number of services and activities to supplement the academic program. The Student Services Division coordinates the following services for students: ACT and admissions testing, counseling, recruitment, financial aid, job placement and follow-up, and student activities. The department is staffed with full-time professional employees who are available to work with students in their areas of interest. The activities of the department are coordinated by the Head of Student Services.

Testing and Counseling

Testing and Counseling are provided to assure that the student receives maximum results from his educational opportunities.

Academic Advising

Each curriculum department head will assign a faculty advisor
for each student within the first 10 days after the student's initial registration and provide a copy of each assignment to the Dean of Instruction and the Head of Student Services. Each instructor will:

1. Post office hours when he will be available to confer with advisees.

2. Have a personal conference with each advisee at least once during each quarter to insure the student's continued academic success.

3. Established and maintain a file on each advisee containing the following information:
   A. Basic information regarding the student including prior education;
   B. Entrance test scores;
   C. Transcripts or copies of grade reports; and
   D. An updated curriculum guide indicating courses taken and required.

Recruitment

A positive, continuing program to provide potential students with current information concerning State Tech is carried out by visits to all area high schools. Contact is made with potential students through letters, posters, advertising in local media and liaison with local industries and civic organizations.

Current students are recognized as valuable resources for recruiting new students and are encouraged to make their friends aware of the opportunities afforded by State Tech.
PLACEMENT

The Placement Service is responsible for the placement of students and graduates of State Tech. It is a free service available to those seeking either part-time or full-time employment.

The Placement Service concentrates on placing students during their last quarter of study. It requests that all second-year students register with the Placement Office at the beginning of the Winter Quarter of their second year.

Employment interviews are arranged with the assistance of the Placement Service. The Placement Service does not operate as an employment agency nor does it guarantee placement of a graduate. Its functions include guiding and directing the student and to obtain for the student the maximum potential opportunities with local, state, and national contacts. A follow-up file is maintained on all graduates and non-graduates from State Tech.

STUDENT ACTIVITIES

There are several activities on campus for students. State Tech encourages extra-curricular activities which develop individual initiative, group leadership and cooperation. Student organization and administration of student activities is a function of the Student Services Division.

Student Government Association

The purpose of the Student Government Association (SGA) is to promote and expand interest in student activities and to serve as an advisory group to both the administration of the school and the student body. The SGA is delegated authority to be responsible for certain specific matters affecting student affairs and represents student opinions in working with the administration toward the good of State Tech. The officers of SGA are the President, the Vice-President, Secretary, Treasurer, and Speaker of the SGA. They are elected during the last four weeks of the Spring Quarter and serve for one year. All other members of the SGA are elected or appointed during the first four weeks of the Fall Quarter and serve one year. The Head of Student Services is the advisor, and the head or a designated representative must be present at all official meetings of the SGA.

Clubs

Honor, social and professional clubs may be organized by the SGA. Organizations not chartered by the SGA will not be recognized as part of the Institute. Those chartered must have the following elected officers: president, vice-president, secretary, treasurer, club reporter, and the representative to the SGA.

The SGA will determine if sufficient interest exists to form or to continue such a club. Each club will have a faculty advisor.

Included among the clubs on campus are a student chapter of the American Society of Certified
Engineering Technicians (ASCET) and the Data Processing Managers Association (DPMA). Both of these clubs sponsor field trips to local businesses and industries and give students the opportunity to meet and talk with working technicians and business people. There are also special interest clubs available to students such as the Veterans Club and the Science Fiction Club.

Student Conduct

All students are expected to maintain acceptable standards of personal conduct and honesty. Any student whose conduct is considered harmful to the rights of others or to the reputation of the school shall be subject to suspension or expulsion. Any student who is expelled or suspended will receive written notification stating the exact reason(s) for disciplinary action. The student is entitled to a hearing before the Academic Standard and Discipline Committee. A student wishing to have his case reviewed should contact the Dean of Instruction. The Dean of Instruction will notify the student of the time and place of the review proceedings and will call a meeting of the committee to hear the student's appeal of disciplinary action. The finding of the committee will be given to the student in writing.

The following areas of misconduct are identified to clarify what constitutes unacceptable student conduct at the institute. Misconduct may be grounds for suspension or expulsion.

1. A student shall not by use of violence, force, noise, coercion, threat, intimidation, fear, passive resistance, or other conduct intentionally cause a disruption or obstruction of any lawful mission, process or function of the school.

2. A student shall not intentionally cause or attempt to cause damage to the school and or private property or steal or attempt to steal school and or private property.

3. A student shall not intentionally cause or attempt to cause physical injury or intentionally behave in such a way which could cause physical injury to a school employee, another student or other persons not employed by the school.

4. A student shall not knowingly possess, handle or transmit any object that can reasonably be considered a weapon.

5. A student shall not knowingly possess, use, transmit or be under the influence of any narcotic drug, hallucinogenic drug, amphetamine, barbiturate, marijuana, alcoholic beverage or intoxicant of any kind. (Exception: prescription from a registered physician.)

6. A student shall not engage in gambling in any form.

More details on student conduct requirements can be found in the 1978-79 Student Handbook.
Veterans

Veterans wishing to apply for educational benefits must complete VA Form 22-1900, "Veterans Application for Program of Education or Training." The Veteran must submit a copy of his DD-214, marriage record (if applicable), divorce decree (if applicable), and birth record of each dependent child. If a veteran has previously used benefits for educational assistance, he must complete VA Form 22-1995. Any change in marital status or dependents since his last school attendance must be verified by marriage license, divorce decree, or birth certificate. The application and all supporting documents should be submitted to the Veterans Coordinator's Office for processing at least eight weeks, if possible, prior to the beginning of the quarter he wishes to attend. Proper application forms for disabled veterans, sons or daughters of veterans, widows or wives of veterans, widowers, or husbands of veterans are available in the Veterans Coordinator's Office.

Continuous Enrollment: The Veterans Administration also has a policy which allows those veterans attending school on a yearly basis (Fall, Winter, Spring and Summer Quarter) to obtain their monthly checks with no interruptions or reduction in benefits due to school classes closing between quarters. However, days paid to the veteran between quarters will be deducted from his total entitlement.

Veterans Administration Policy: VA Regulations forbid a veteran from repeating any course that has been passed with a 'D' or above or any course that has been transferred from another school. Veteran students may not take any course that is not listed in the catalog under their curriculum even though they are not counting it for VA benefits. Veterans may not be certified for a course they have received an "I" grade in unless the "I" converts to an "F".

Record of Student Work

Records of each student's grades are kept on permanent file in the Records Office. These are permanent and are frequently referred to for the purpose of supplying information to legitimate sources. All transcript requests must be in writing and will not be taken by telephone. In all cases, obligations to the Institute must be fulfilled before a transcript will be issued.

Transcripts will be sent on request for students under Special Admission Status with the following statement: All Admission Requirements Have Not Been Completed.
With the continuing emphasis on computer usage in all phases of business and science, the role of the computer programmer is gaining in importance. The school strives to teach students to become competent computer programmers preparing them for rewarding careers in data processing.

As the curriculum name implies, emphasis is placed on business applications of computer programming. Considerable course time is spent learning the computer languages most applicable to business environments. Students also learn basic business fundamentals in order to understand better the underlying problems of business data processing. These business courses together with foundation courses in English, mathematics and statistics will enable the student to communicate effectively with others in a data processing environment.

A computer program is usually developed via a three-part procedure: careful evaluation of the problem; analysis of alternate solutions; and a final implementation. Therefore, analytical tools are introduced to students to aid in this procedure. With these tools, the student can assist in the design and development of an automated system.

Students completing the course outlined in the data processing curriculum can expect to find careers in diversified areas such as accounting firms, hospitals, government installations, universities and many other public and private concerns. The well-trained data processing technician has a wide horizon of job opportunities.

**TYPICAL POSITIONS OPEN TO DATA PROCESSING TECHNICIANS**

Applications programmer — A person, normally employed by a computer user, who converts a problem into a set of directions for a computer to solve.

Systems representative — A person, usually employed by a computer manufacturer, who provides customer programming support. Normally travels from installation to installation.

Systems programmer — A person, normally employed by a computer user, who is responsible for maintaining programs supplied by the manufacturer which are an essential part of the computer’s operational environment.
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<tr>
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### TOTAL HOURS

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**ECONOMICS**
EC 101 Economics

**ENGLISH**
EN 101 Oral Communications
EN 102 Patterns of Composition
EN 103 Technical Report Preparation

**MATHEMATICS**
MA 141 Business Math I
MA 142 Business Math II
MA 143 Business Math III

**SOCIAL SCIENCE**
SC Social Science Elective

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BU 116 Personal Financial Management  4 Credits
4 Class Hours, 0 Lab Hours
This course provides an understanding of the fundamental aspects of managing one's personal finances. Emphasis is placed on setting personal financial goals, preparing personal financial statements, protecting income and assets using appropriate insurance, and setting up long range investment programs.

BU 120 Marketing  5 Credits
3 Class Hours, 0 Lab Hours
An introductory study of the movement of goods from producer to consumer through various channels of distribution; the functions of marketing costs, choice of policies; and social and economic implications.

BU 121 Principles of Accounting I  4 Credits
3 Class Hours, 3 Lab Hours
A course which includes basic principles of accounting theory and practice, analysis and recording of business transactions, business documents, books and controlling accounts, adjusting and closing entries and payroll accounting.

BU 122 Principles of Accounting II  4 Credits
3 Class Hours, 3 Lab Hours
A course which includes merchandise inventory, deferrals and accruals, fixed assets, systems and controls and partnership and corporate accounting.
Prerequisite: BU 121

BU 123 Principles of Accounting III  4 Credits
3 Class Hours, 3 Lab Hours
A course which includes cost accounting systems, budgetary control and standard costing, cost and revenue relationship for management, management, management reports and special analyses, funds statement and cash flow and financial statement analysis.
Prerequisite: BU 122
BU 124 Business Law 4 Credits
4 Class Hours, 0 Lab Hours
Principles of law as applied to business transactions, including contracts, agency, employment, negotiable instruments, and personal property.

BU 201 Principles of Management 4 Credits
4 Class Hours, 0 Lab Hours
This course undertakes the study of management by analyzing the basic managerial functions and relating these to the manager's total environment. Differing management theories are researched along with the total organization and its role in present society. Management is approached through a component breakdown with each area being researched in detail.

BU 202 Accounting Systems 3 Credits
3 Class Hours, 0 Lab Hours
A study of various types of business accounting systems, analyzing the advantages and disadvantages of each case study.
Prerequisite: BU 123

BU 203 Taxation 3 Credits
3 Class Hours, 0 Lab Hours
A course which integrates the principles of accounting and law into the understanding of income taxation.

BU 205 Auditing 4 Credits
3 Class Hours, 3 Lab Hours
A course which incorporates extensive material on accounting systems and discusses computer applications as a part of the auditing process.

BU 210 Introduction to Finance 3 Credits
3 Class Hours, 0 Lab Hours
The subject matter surveys the whole field of finance, both public and private.

BU 211 Payroll Procedures 3 Credits
3 Class Hours, 0 Lab Hours
This course teaches procedures followed in handling the payroll. These will include working with time cards, payroll records, payroll deductions, employee earning records, paying employees, and accounting for payroll funds.

BU 221 Intermediate Accounting I 4 Credits
3 Class Hours, 3 Lab Hours
A study of accounting records, end-of-period procedures, net income concepts, corrections of prior periods, and the capital structure of a business.

BU 222 Intermediate Accounting II 4 Credits
4 Class Hours, 4 Lab Hours
This course covers such topics as investments, plant and equipment, intangible assets, long-term liabilities and paid-in-capital.

BU 231 Cost Accounting I 4 Credits
3 Class Hours, 3 Lab Hours
A study of the fundamentals of cost accounting within an industrial
organization. The accounting function relative to materials, labor, overhead and marketing are treated in detail.

**BU 232 Cost Accounting II** 4 Credits
3 Class Hours, 3 Lab Hours
A continuation of Cost Accounting I (BU 231) in which process and standard cost systems are developed in detail with emphasis directed toward the budgeting and managerial control functions.

**DP 101 Introduction to Data Processing** 4 Credits
3 Class Hours, 3 Lab Hours
Fundamentals of data processing vocabulary, basic description of hardware and its uses, a history of hardware applications, and a survey of the functions of software. Attention is given also to the implications of future computer technology and the relationship between the computer and society and the computer and the business world. The lab work includes an introduction to basic computer language and flowcharting including the preparation and processing of individual programs.

**DP 102 Computer Programming for Engineering Technology** 4 Credits
3 Class Hours, 3 Lab Hours
An introduction to computer systems and applications. Survey of computer technology history and relationship of the computer and society in the future. Flowcharting and programming concepts are taught through use of the BASIC programming language.

**DP 111 Computer Programming (ASSEMBLER)** 4 Credits
3 Class Hours, 3 Lab Hours
The study and development of a manufacturer's assembly language. The student will write and debug programs in an ASSEMBLER language and also be capable of employing this language in a total programming system. The principles of debugging and core-dump reading will be given major emphasis.

**DP 112 Advanced Assembler** 4 Credits
3 Class Hours, 3 Lab Hours
Continuing study of ASSEMBLER language with emphasis placed upon applications to systems programming. Topics covered include subroutine linkage, organization and access methods of sequential and indexed sequential files.

Prerequisite: DP 111 or Co-requisite: DP 101

**DP 121 Computer Programming (RPG)** 4 Credits
3 Class Hours, 3 Lab Hours
The study and development of programming capabilities in the business computer language Report Program Generator (RPG). Includes program logic, block diagramming, coding techniques, documentation, advantages and disadvantages of RPG as a high-level language in small and medium scale installations.
DP 122 Advanced RPG Programming 4 Credits 3 Class Hours, 3 Lab Hours
Continuation of DP 121 with emphasis on disk file organization and utilization; tables and arrays; and RPG advanced topics.
Prerequisite: DP 121

DP 131 Computer Programming (COBOL) 4 Credits 3 Class Hours, 3 Lab Hours
Experience in using programming techniques with a high level language. Students will be required to program, debug, and test specified business oriented problems using COBOL.

DP 201 Fortran Applications 4 Credits 3 Class Hours, 3 Lab Hours
The study and development of the business applications of Fortran IV, including input-output formatting, loop control, arithmetic statements, arrays, tables, and subprograms.
Prerequisite: DP 101

DP 213 Real-Time Applications 4 Credits 3 Class Hours, 3 Lab Hours
An introduction to the hardware and software systems which support today's on-line real-time business systems. Time sharing, multiprogramming, and multiprocessing systems are investigated as they relate to real-time systems.
Prerequisite: DP 221

DP 221 Systems Design and Development 3 Credits 3 Class Hours, 0 Lab Hours
A study of the overall computer based systems analysis and design process, information problems of business organization and the inter-relationship of functions, nature of business problem isolation and definition, and initial phase of systems analysis and evaluation.

DP 222 Systems and Procedures 3 Credits 2 Class Hours, 3 Lab Hours
Development and design of data processing systems, includes evolution of systems, analysis and requirements of systems, feasibility studies and justification procedures, system specification and equipment selection, data controls, systems controls, system evaluation, and system implementation case studies.
Prerequisite: DP 221

DP 223 Data Base Management 4 Credits 3 Class Hours, 3 Lab Hours
A presentation of the major concepts and features of software systems known generally as Data Management Systems. Emphasis is placed on the generalized self-contained capabilities of data base creation and use, as opposed to more highly specialized functions. The user environment which has led to the development of Data Management Systems (DMS) is examined and the relationship between DMS and the modern management information system is explored. Most of the major topics are supported by extensive
laboratory projects.

**DP 232 Computer Programming (Advanced COBOL) 4 Credits**
3 Class Hours, 3 Lab Hours
A course which introduces advanced programming techniques using the COBOL language. Students will be expected to use disk files and random access techniques to solve programming problems.
Prerequisite: DP 131

**DP 233 Computer Programming Applications (COBOL) 5 Credits**
3 Class Hours, 6 Lab Hours
A course in which students will be assigned comprehensive problems which will utilize the various COBOL programming techniques learned in prior courses. Heavy emphasis will be on technique and efficiency in both program design and testing.
Prerequisite: DP 232

**DP 234 Advanced Programming Applications 8 Credits**
3 Class Hours, 15 Lab Hours
This course is designed to afford students practical work experience with a local data processing installation. The requirements include: approval of work situation by data processing department chairperson, satisfactory work experience as reported by cooperating data processing manager, and completion of prescribed programming or systems application related to commercial data processing.
Prerequisites: Completion of all course work through fifth quarter and departmental approval.

**EC 101 Principles of Economics 3 Credits**
3 Class Hours, 0 Lab Hours
A course which includes a presentation of basic economic concepts including types of business organization, supply and demand determination, market structure classification, profit maximization, and microeconomic role in government.
The chemical engineering technician is a technical assistant to the chemical engineer and, as such, must be able to speak the language of the engineer.

Specifically, he must be familiar not only with the basic concepts of mathematics, chemistry, and physics but also with the variety of techniques and equipment used in the chemical processing industries.

An ever-expanding field, chemical engineering technology is employed extensively in industries which process plastics and synthetics, food and beverages, petroleum chemicals and products, paper, and industrial chemical intermediates. In addition, chemical engineering technology plays an important role in environmental control and in many other areas. As a result of continuing expansion in the field, engineering technicians with the necessary skills for advancement are offered new and exciting careers across a broad spectrum of industrial complexes and governmental agencies.

**TYPICAL POSITIONS OPEN TO CHEMICAL ENGINEERING TECHNICIANS**

**Development technician** — assists engineers and chemists in developing new processes, improving existing processes, and carrying bench projects into pilot and/or full scale operation.

**Environmental control technician** — works with the chemical engineer or environmental engineer to oversee municipal or industrial air and water purification.

**Pilot plant operator** — operates equipment in research and development of new processes and products.

**Chemical production technician** — works in commercial plant with engineers and plant supervisors to help solve problems or improve operations.

**Process instrumentation technician** — works with the chemical engineer to assist in the design, testing, and installation of process control instrumentation.

**Chemical salesperson** — sells chemicals and assists customers in the development of uses for chemicals.

**Chemical instrument salesperson** — sells and services instruments and assists in the development of new process control instrumentation.
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<th>Lab</th>
<th>Credit Hours</th>
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CHEMICAL ENGINEERING TECHNOLOGY

CH 101 Industrial Seminar 1
CH 131 Chemical Engineering Calculations I 4
CH 132 Chemical Engineering Calculations II 4
CH 201 Industrial Inspection Trips 1
CH 221 Chemical Engineering Materials 4
CH 231 Automatic Control of Processes 4
CH 241 Chemical Engineering Principles I 3
CH 242 Chemical Engineering Principles II 3
CH 243 Chemical Engineering Principles III 3
CH 244 Unit Operations Laboratory 2
CH 291 Industrial Safety 3
Major Elective % 8

40

CHEMISTRY

CH 111 Inorganic Chemistry I 4
CH 112 Inorganic Chemistry II 4
CH 121 Organic Chemistry 4
CH 211 Analytical Chemistry 4
Major Elective 4

20

DATA PROCESSING

DP 102 Computer Programming for Engineering Technology 4
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SOCIAL SCIENCE

Elective 3
Technical Elective* 3
TOTAL CREDIT HOURS REQUIRED 107

* The major elective will consist of a three-quarters study taken from one of the following areas:

POLYMER TECHNOLOGY
CH 251 Polymer Processing Principles I
CH 252 Polymer Processing Principles II
CH 271 Polymer Chemistry

ENVIRONMENTAL TECHNOLOGY
CH 261 Environmental Control Principles I
CH 262 Environmental Control Principles II
CH 281 Environmental Chemistry

* * Technical electives will be taken from a list of approved courses.
CH 101 Industrial Seminar
1 Credit
1 Class Hour, 0 Laboratory Hours
A study of the organization of typical local industries and the role of the chemical engineering technician. Emphasis will be placed on group discussion with outside speakers from local industries.

CH 111 Inorganic Chemistry I
4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the structure of atoms, chemical bonds, the nature of electromagnetic radiation, periodic relationships, chemical nomenclature, chemical formulae, the concept of the mole, calculations using weight relationships, the nature of solutions, expressing concentrations, the concept of acids and bases, states of matter, the concept of pressure, the ideal gas law, and an introduction to oxidation and reduction reactions. The laboratory work includes experiments which illustrate the classroom material and provide for the development of laboratory techniques and procedures.
Co-requisite: MA 101

CH 112 Inorganic Chemistry II
4 Credits
3 Class Hours, 3 Laboratory Hours
The second course in inorganic chemistry covering many topics related to physical chemistry. Specific topics are chemical kinetics, reaction rate, order of a chemical reaction, reversible reactions, chemical equilibrium, ionic equilibria, ionization of weak electrolytes, ionization constants, ionization of water, hydrogen ion concentration, buffered solutions, solubility product constant, thermochemistry, enthalpy, entropy, free energy, electrochemistry, oxidation-reduction reactions and electromotive series. Related laboratory experiments illustrate the principles involved.
Prerequisite: CH 111
Co-requisite: MA 102
CH 121 Organic Chemistry
3 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the physical and chemical properties of compounds of carbon with strong emphasis on the theoretical and practical understanding of the nature of organic chemical reactions. Memorization of specific reactions and of group reactions will be subordinated and strong emphasis placed on understanding the conditions that affect the initiation and rate of organic reactions. Organic chemical nomenclature will be studied and the use and production of organic chemicals in industry will be surveyed.
Prerequisite: CH 112

CH 131 Chemical Engineering Calculations I
3 Credits
3 Class Hours, 3 Laboratory Hours
An introduction to the basic methods of engineering analysis and calculation. Topics will include conversion of units, proper format for engineering calculations, the use of graphs to represent data and functions, logarithm and slide rule calculations, and material balances. Material balance calculations will be made on simple systems (with and without chemical reactions) including bypass and recycle operations. A calculations laboratory provides an opportunity for students to work problems under supervision.
Prerequisite: CH 131, MA 101

CH 132 Chemical Engineering Calculations II
3 Credits
3 Class Hours, 3 Laboratory Hours
A course covering elementary thermodynamics, energy balances (with and without chemical reactions) and the use of simple process flow diagrams. A calculations laboratory provides an opportunity for students to work problems under supervision.
Prerequisite: CH 131, MA 102

CH 141 General Chemistry
4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the basic concepts needed to understand chemical reactions — atomic structure, electron energy levels, the periodic table, chemical bonds, chemical formulae, chemical equations, the concept of the mole, oxidation-reduction reactions, acid-base reactions, electromotive series, states of matter, solutions ionization in aqueous solution, chemical reaction rates, and chemical equilibria. The above basic concepts are used to study semiconductors, electrolytic cells, corrosion, the electrolytic capacitor and engineering materials. The laboratory work emphasizes the study of electrochemical reactions with common practical applications.
Prerequisite: MA 102

CH 151 Introductory Chemistry
4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering basic physical and chemical concepts of matter. Topics covered include systems of measurement, density, pressure, states of matter, physical and chemical changes, elements,
atoms, compounds, the periodic table, chemical nomenclature, chemical reaction equations, and calculations using chemical reaction equations. The laboratory work will emphasize laboratory techniques and experiments to demonstrate the topics covered. Prerequisite: Students need a working knowledge of algebra (or MA 100 as a co-requisite)

CH 153 Water Analysis 2 Credits
6 Class Hours, 4 Laboratory Hours
This course covers analytical procedures used in water purification facilities for quality control and in municipal type waste water treatment facilities for control of operation and evaluation of effluent. The theory of analysis will be covered only minimally, and emphasis will be placed on following written analytical procedures and performing analyses accurately in the laboratory. Methods of obtaining samples will also be covered.
Prerequisite: CH 111

CH 201 Industrial Inspection Trips 1 Credit
0 Class Hours, 3 Laboratory Hours
A study of the technology of local industries. Visits will be made to industrial facilities which are representative of major local industries. Written reports of visits will be stressed. Techniques for job interviews and preparation of resumes will also be presented.

CH 211 Analytical Chemistry 4 Credits
2 Class Hours, 6 Laboratory Hours
A course concerning the fundamental principles of the chemical and physical methods used in the chemical analysis of materials. The laboratory work will concentrate on familiarization with a wide variety of analytical techniques and equipment used in industry including gravimetric and volumetric methods and instrumental methods such as infrared spectroscopy and gas-liquid chromatography.
Prerequisite: CH 112

CH 221 Chemical Engineering Materials 4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the mechanical, physical, and chemical properties of engineering materials. The mechanisms and control of reactions of engineering materials with their environment will be discussed. Emphasis will be placed on the determination of suitable materials for use in various chemical processing applications.

CH 231 Automatic Control of Processes 4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the fundamentals and techniques of process control. Topics will include the elements of control theory, measurements of basic industrial parameters (such as flow rate, temperature, liquid level, and pressure), and industrial instrumentation. Emphasis will be placed on the selection, placement and setting of control equipment.
CH 241 Chemical Engineering Principles I 3 Credits
3 Class Hours, 0 Laboratory Hours
The first in a series of three courses covering fundamentals of chemical engineering principles. This first course covers fluid statics and dynamics. Topics include viscosity, fluid statics, manometers, flow measurement, laminar and turbulent flow, Reynolds number, fanning friction factor, pressure drop in pipes, fittings and valves, particle dynamics, pumps, NPSH, blowers, compressors, and steam jets.
Prerequisite: MA 103, CH 132

CH 242 Chemical Engineering Principles II 3 Credits
3 Class Hours, 0 Laboratory Hours
The second in a series of three courses covering fundamental chemical engineering principles. This second course covers transmission of heat in heat exchangers of various configuration — including shell and tube exchangers, jacketed vessels, coils and fins, evaporators and solids processors.
Prerequisite: CH 241

CH 243 Chemical Engineering Principles III 3 Credits
3 Class Hours, 0 Laboratory Hours
The third in a series of three courses covering fundamental chemical engineering principles. This third course covers selected operations involving mass transfer in combination with fluid flow and heat transfer. Topics include fractional distillation, humidification, gas absorption, liquid extraction, and drying. Problems of scale-up will be discussed.
Prerequisite: CH 242

CH 244 Unit Operations Laboratory 2 Credits
0 Class Hours, 6 Laboratory Hours
A course consisting of laboratory experimentation in the unit operations of chemical engineering. Experiments will include flow systems, heat transfer systems, and mass transfer systems. Emphasis will be placed on student assembly and operation of equipment and preparation of detailed laboratory reports.
Prerequisite: CH 242
Co-requisite: CH 243

CH 251 Polymer Processing Principles I 4 Credits
3 Class Hours, 3 Laboratory Hours
The first of two courses covering polymer processing. This course will integrate the theoretical and practical aspects of polymer processing in covering extrusion of thermoplastics. Extrusion of profiles, film, sheet, fibers, and foam will be covered along with the primary extrusion equipment and the auxiliary equipment used in each type of extrusion. Other continuous polymer processing operations such as calendering and laminating will also be covered.
Prerequisite: CH 271 or consent of the instructor.
CH 252 Polymer Processing Principles II 4 Credits
3 Class Hours, 3 Laboratory Hours
The second of two courses covering polymer processing. This course will cover polymer processing applications in which a mold is used to shape the polymer. The processes studied in this course are characterized by discrete processing steps rather than continuous uninterrupted polymer flow. Emphasis will be placed on the special geometry of parts to be made in molds and on the geometry and construction of molds. Mold cooling and part shrinkage will also be covered. Prerequisite: CH 251 or consent of the instructor.

CH 261 Environmental Control Principles I 4 Credits
3 Class Hours, 3 Laboratory Hours
The first of two courses intended as an introduction to air and water pollution control. This first course will deal primarily with air pollution. Pollutants of interest or concern to local industries will be emphasized, and both the methods of analysis and the methods of controlling emissions will be studied for each pollutant. Subjects covered will include sulfur dioxide, carbon monoxide, nitrogen oxides, odors, and noise.

Prerequisite: CH 281

CH 262 Environmental Control Principles II 4 Credits
3 Class Hours, 3 Laboratory Hours
The second of two courses intended as an introduction to air and water pollution control principles. This second course will deal primarily with water pollution. The most important pollutants will be covered, and both the methods of analysis and the methods of controlling emissions will be studied for each pollutant. The subjects will include biodegradable and non-biodegradable organic compounds, phosphates, nitrates and other nutrients, heavy metals, and dissolved salts.

Prerequisite: CH 281

CH 271 Polymer Chemistry 4 Credits
3 Class Hours, 3 Laboratory Hours
A survey of the chemical and physical properties of long-chain molecules. Topics will include polymerization, polymer characterization, glass and melting transitions, and polymer structure and related properties. Nylon and methyl methacrylate polymerization will be covered specifically.

Prerequisite: CH 121

CH 281 Environmental Chemistry 4 Credits
3 Class Hours, 3 Laboratory Hours
A study of the chemistry of air and water pollution. Topics will include chemical reactions of air and water contaminants, sampling techniques and analysis of air and water for major pollutants.

Prerequisite: CH 121 or consent of the instructor.

CH 291 Industrial Safety 3 Credits
3 Class Hours, 0 Laboratory Hours
A course surveying the development of safety standards and their application to the chemical processing industries. The requirements of the Occupational Safety and Health Act will be presented. Emphasis will be placed on the best modern industrial standards and methods for a good safety program.

CH 295, 296, 297 Research Problem
Maximum of 3 Credits Per Quarter

Investigation and reporting of a chemical engineering problem with industrial application of interest to both the student and the advisor. Based on the problem difficulty, 3, 6, or 9 credit hours will be awarded. No credit will be given until a report is completed and approved. Topics are presented on a demand basis.

Prerequisite: Degree standing and consent of the instructor.
The Construction Engineering Technology encompasses the broad fields of architecture, construction, and civil engineering. The curriculum presents theory, practical application, and related study instruction that will prepare graduates for direct entry into employment in the construction industry.

The construction industry has vastly expanded in technical innovations, thereby requiring technical knowledge and skills to manage and solve problems involved with construction projects. As a result, this expertise, in the form of a construction engineering technician, is required for the following positions:

**materials tester** — assists engineers in testing soils, concrete, and various construction materials.

**architectural or engineering field representative** — visits construction projects and reports on job progress and compliance with construction documents.

**superintendent's aide** — assists superintendent or project manager in monitoring construction activity.

**surveyor's rod person or chainperson** — assists party chief in performing surveying work.

**sales representative** — sells and advises customers regarding the use of various construction materials.

**estimator aide** — assists estimator in preparing quantity and pricing surveys.

**plan reviewer or building inspector** — works for an agency reviewing compliance with prevailing construction guidelines.

**draftsperson** — assists in the production of architectural, engineering working, or shop drawings.
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<tr>
<td>CT 233</td>
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<td>CT 254</td>
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<td>DR 221</td>
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FOURTH QUARTER (Fall)

FIFTH QUARTER (Winter)

SIXTH QUARTER (Spring)
## CONSTRUCTION ENGINEERING TECHNOLOGY

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<thead>
<tr>
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<tr>
<td>CT 101</td>
<td>Building Methods of Light Construction</td>
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<tr>
<td>CT 102</td>
<td>Building Methods of Heavy Construction</td>
<td>3</td>
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<tr>
<td>CT 111</td>
<td>Construction Materials</td>
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<tr>
<td>CT 211</td>
<td>Soils and Foundations</td>
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<td>CT 121</td>
<td>Surveying I</td>
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<tr>
<td>CT 221</td>
<td>Surveying II</td>
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<tr>
<td>CT 231</td>
<td>Statics and Strength of Materials</td>
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<td>CT 232</td>
<td>Structural Steel Design</td>
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<td>CT 233</td>
<td>Reinforced Concrete Design</td>
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<td>CT 241</td>
<td>Heating, Ventilation &amp; Air Conditioning</td>
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<td>CT 242</td>
<td>Building Plumbing and Electrical Systems</td>
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<td>CT 251</td>
<td>Construction Documents</td>
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<td>CT 252</td>
<td>Estimating</td>
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<td>CT 253</td>
<td>Project Control and Construction Management</td>
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<td>Construction Rehabilitation</td>
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**Total Credit Hours:** 56

## DRAFTING

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<td>DR 122</td>
<td>Architectural Drawing Techniques II</td>
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<td>DR 221</td>
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**Total Credit Hours:** 9
ENGLISH

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<td>EN 102 Patterns of Composition</td>
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<td>EN 103 Technical Report Preparation</td>
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MATHEMATICS

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PHYSICS

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<td>PH 103 Physics of Heat, Light and Sound</td>
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SOCIAL SCIENCE

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<td>Technical Elective*</td>
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Total Hours: 102

*Technical electives may be selected from the following courses after consultation with and approval by the department chairperson.

Technical Electives

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<tr>
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<tbody>
<tr>
<td>CT 256 Code Interpretation</td>
<td>3</td>
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<tr>
<td>ME 271 Introduction to Solar Energy</td>
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63
CT 101 Building Methods of Light Construction  
3 Credits
3 Class Hours, 0 Laboratory Hours
Building Methods of Light Construction covers basic techniques and fundamentals essential in erecting a light frame building. This course covers various phases of light construction in a logical sequence beginning with the building site, through each building system, to the finished work.

CT 102 Building Methods of Heavy Construction  
3 Credits
3 Class Hours, 0 Laboratory Hours
This course covers techniques and procedures necessary to construct a complex structure. Study will involve the various phases of heavy construction from building site to finished work. Emphasis will be placed on building systems which will utilize engineering and innovation in the process of realizing a final product.
Prerequisite: CT 101

CT 111 Construction Materials  
4 Credits
3 Class Hours, 3 Laboratory Hours
Characteristics and methods of handling the basic construction materials. Emphasis is placed on using the characteristics to determine the advantages and disadvantages of using the material in relation to application. Topics covered include wood, laminants, cements, aggregates, concrete and mix design, mortar, steel, etc. Test procedures are emphasized.
Prerequisite: CT 102

CT 121 Surveying I  
4 Credits
3 Class Hours, 3 Laboratory Hours
An introductory course on surveying designed to familiarize the student with the use of the steel tape, the transit, and the level, with emphasis on applications of these instruments in engineering and construction projects such as boundary surveys, traverse computations, profile leveling, and field notes. Prerequisite: MA 101
CT 211 Soils and Foundations  
4 Credits
3 Class Hours, 3 Laboratory Hours
Topics discussed include soil properties, classification, compaction, shear strength, consolidation, lateral earth pressure, bearing capacity and settlement. The student will conduct and file reports on laboratory tests.
Prerequisite: CT 111
Co-requisite: CT 231

CT 221 Surveying II  
4 Credits
3 Class Hours, 3 Laboratory Hours
Using the survey and layout course as a foundation, this advanced course will develop with greater detail the student's understanding of surveying procedures. Course material will include control systems and datums, mapping and subdividing, volume calculations, horizontal and vertical curves, precision and boundary surveying.
Prerequisite: CT 121

CT 231 Statics and Strength of Materials  
4 Credits
3 Class Hours, 3 Laboratory Hours
A study of forces: their effects as found in structures under conditions of equilibrium and methods of solution. This course deals with internal effects resulting from the applications of various types of loads. Principles of stress and strain, shear and bending are covered so that a material's strength may be measured or calculated in various load-carrying configurations, such as beams, columns, compression or tension structures.
Prerequisite: CT 111 & MA 102

CT 232 Structural Steel Design  
4 Credits
3 Class Hours, 3 Laboratory Hours
The design of structural steel members and their connections, tensions, compression members, beams, girders, trusses, and columns subjected to concentric and eccentric loads. The lab involves prototyping of various structural systems, performing calculations, and preparing drawings related to steel design.

CT 233 Reinforced Concrete Design  
4 Credits
3 Class Hours, 3 Laboratory Hours
Design of reinforced concrete structures, fundamentals of design of beams, columns, floor systems, footing and retaining walls. The lab involves prototyping of various structural systems, performing calculations, and preparing drawings related to reinforced concrete design.
Prerequisite: CT 231

CT 241 Heating, Ventilation & Air Conditioning  
4 Credits
3 Class Hours, 3 Laboratory Hours
This course introduces the principles and basic systems involved in heating, cooling, and conditioning of air; topics include heat transmission, solar effects, air movement, forced air, radiation, and electrical heating systems, cooling systems, filter systems,
humidifying and dehumidifying systems.  
Prerequisite: CT 111

CT 242 Building Plumbing and Electrical Systems 4 Credits  
3 Class Hours, 3 Laboratory Hours
A study of basic hydraulics; water sources and distribution; plumbing systems; sewage systems, sewage treatment, and storm drainage. Introduction to electrical distribution, lighting, and acoustics.  
Prerequisite: CT 241

CT 251 Construction Documents 3 Credits  
3 Class Hours, 0 Laboratory Hours
This course covers construction drawings, specifications, bonds, contracts, and other documents related to the construction industry. Topics also included will be legal problems, contractor relations and responsibilities, contract performance requirements, and bidding procedures.  
Prerequisite: CT 102

CT 252 Estimating 4 Credits  
3 Class Hours, 3 Laboratory Hours
The student is taught to develop the methods and procedures for preparing quantity surveys dealing with individual sections of work. Topics include calculation of quantities of masonry, concrete, steel, excavation, lumber, labor considerations, pricing, etc. Emphasis is placed on take-off procedures and the development of quantity survey sheets.  
Prerequisite: CT 251

CT 253 Project Control and Construction Management 3 Credits  
3 Class Hours, 0 Laboratory Hours
This course is designed to provide the student with the tools and procedures needed to control a construction project. Areas to be explored will include physical layout of the site, the sequence of operations, and their scheduling. Such scheduling will include labor requirements, subcontractors and material deliveries. Planning methods to be studied will include bar charts and the critical path. Reports, job logs, and cost control systems will receive attention.  
Prerequisite: CT 252

CT 254 Construction Rehabilitation 3 Credits  
3 Class Hours, 0 Laboratory Hours
This course covers the practices and procedures involved in restoring or renovating an existing structure. Emphasis is placed on analysis of existing structural components and existing material usage to determine if the structure is capable of being rehabilitated, then on the techniques and fundamentals to rehabilitate it.  
Prerequisite: CT 111

CT 255 Construction Safety 1 Credit  
1 Class Hour, 0 Laboratory Hours
The intent of this course is to introduce the student to the concept of construction safety and to draw together some approaches to the problem of complying with the Occupational Safety and Health

Prerequisite: CT 102

DR 211 Architectural Drawing Techniques I  3 Credits
1 Class Hour, 6 Laboratory Hours

Architectural Drawing I covers basic techniques and fundamentals essential in preparing a student to produce architectural drawings. Use of drafting equipment, lettering techniques, freehand sketching, as well as presentation techniques, will be covered in this course.

DR 221 Construction and Civil Drawing Techniques  3 Credits
1 Class Hour, 6 Laboratory Hours

This course covers the fundamentals and techniques used in architectural detailing of concrete, steel, and masonry structural members meeting specified requirements, as well as topographical, site, and map drawing.

Prerequisite: DR 122
The program in Electronic Engineering Technology offers instruction in mathematics, science, electrical and electronic fundamentals and general education studies. This program is designed to prepare individuals to work at the technician level in the development, manufacture, instrumentation, testing, research, installation and maintenance fields. The technician requires some of the knowledge and skills of both the professional engineer and the skilled craftsman. Developmental courses are available to assist students whose skills need to be raised to a college performance level.

The three major areas offered by the school are the study of digital, power, and communications electronics. In the first area, the student will learn how electronic devices are used in the computer world as well as in control and switching applications. The second area is devoted to the study of electric power distribution. The third area is allocated to the communications industry. The graduate technician can apply skills to processes and may perform simple design tasks under the supervision of an engineer.

A grasp of the theory of electricity and circuitry is basic. The technician will understand the use of transistors and other solid state devices. The electronic engineering technician may be employed by any industry using these devices, but would likely find a ready job market in the following areas:
1. Power Generation and Distribution
2. Industrial Process Control
3. Numerical Control Systems
4. Research and Development
5. National Defense
6. Electronic Data Processing
7. Communications

**TYPICAL POSITIONS OPEN TO ELECTRONIC ENGINEERING TECHNICIANS**

Electronic technician — applies electronic circuit theory to layout; builds, tests, repairs and modifies developmental and production electronic equipment such as computers, missile-control instrumentation and machine-tool numerical controls.

Electronic mechanic — Repairs electronic equipment such as computers, industrial controls, radar systems, telemetering and missile-control systems, following blueprints and manufacturers specifications.

Component inspection technician — inspects and repairs electronic computer components and sub-assemblies, following schematic diagrams and specifications using handtools and electronic testing instruments.

Electronic assembler — assembles electronic equipment using electronic test equipment, following blueprints, wiring diagrams, and manufacturing standards.
Systems quality control inspector — inspects electronic systems such as radar navigation, telemetrying equipment and computer memory units, following specifications and using precision measuring instruments.

Electrical control assembler — assembles protective, communication and control devices, such as switches, relays, rheostats, transmitters and switchboards as laid out in drawings and wiring diagrams.

System testing laboratory technician — devises and modifies electronic instrumentation and apparatus used to test and evaluate electrical, electronic, electromechanical and electro-hydraulic systems equipment.

Electronic systems tester — tests complete electronic systems, such as radio or television transmitters and computer memory units using electronic testing equipment and wiring diagrams.

Communication equipment salesman — sells communications equipment utilizing knowledge of electronics.
<table>
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<tr>
<th>Course</th>
<th>Hours Per Week</th>
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<tr>
<td><strong>FIRST QUARTER (Fall &amp; Winter)</strong></td>
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<tr>
<td>EN 101 Oral Communications</td>
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<td>ET 105 Seminar</td>
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<td><strong>SECOND QUARTER (Winter &amp; Spring)</strong></td>
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<td>ET 102 Electric Circuits II</td>
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<tr>
<td>ET 121 Active Devices I</td>
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<td><strong>THIRD QUARTER (Spring &amp; Summer)</strong></td>
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<td>EN 102 Patterns of Composition</td>
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<td>MA 103 Applied Calculus I</td>
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<tr>
<td>ET 103 Electric Circuits III</td>
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<td>ET 122 Active Devices II</td>
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<tr>
<td>DR 111 Technical Drawing for Electronics</td>
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<tr>
<td>ET 231 Introduction to Digital Logic</td>
<td>3</td>
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<tr>
<td>ET 232 Pulse and Digital Circuits</td>
<td>3</td>
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<tr>
<td>DP 102 Computer Programming for Engineering Technology</td>
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<tr>
<td>ET 241 Introduction to Rotating Machines</td>
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<tr>
<td>ME 126 Shop Practices</td>
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<tr>
<td>ET 242 Instrumentation</td>
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<tr>
<td>ET 260 Special Project</td>
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<td>EN103 Technical Report Preparation</td>
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**TOTAL CREDIT HOURS 98**
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<td>ET 241</td>
<td>Introduction to Rotating Machines</td>
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**ENGLISH**

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<td>EN 102</td>
<td>Patterns of Communication</td>
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<td>EN 103</td>
<td>Technical Report Preparation</td>
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MATHEMATICS

MA 101 Algebra and Trigonometry I  5
MA 102 Algebra and Trigonometry II  5
MA 103 Applied Calculus I  4

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MECHANICAL ENGINEERING TECHNOLOGY

ME 126 Shop Practices  2

PHYSICS

PH 101 Physics of Mechanics  4

SOCIAL SCIENCE

SC 101 Human Relations  3

TECHNICAL ELECTIVES

EET  4
EET  4
PH 103 or CH 141  4

12

TOTAL CREDITS 98
ET 101 Electric Circuits I
4 Credits
3 Class Hours, 3 Laboratory Hours
An introductory course in DC Electric Circuits. Topics treated include units and notations, atomic structure, current and voltage, resistance, Ohm’s Law, power, energy, series circuits, parallel circuits, series-parallel networks, analysis methods and network theorems. The various types of electronic measuring instrumentation are introduced throughout the course as required.
Co-requisite: MA 101

ET 102 Electric Circuits II
4 Credits
3 Class Hours, 3 Laboratory Hours
An intermediate course in electric circuits in which subject matter pertaining to the transition from the study of DC to AC circuits is treated as well as all basic AC circuit behavior. Topics treated are capacitors, magnetic circuits, inductors, sinusoidal alternating current, phasors, series and parallel AC Circuits and series-parallel AC networks. The various types of electronic measuring instrumentation are introduced throughout the course as required.
Co-requisite: MA 102
Pre-requisite: ET 101

ET 103 Electric Circuits III
4 Credits
3 Class Hours, 3 Laboratory Hours
A course in advanced AC Electric Circuits. Topics treated are analysis methods, network theorems (AC) and power (AC), resonance, polyphase systems, non-sinusoidal circuits, transformers, and two part parameters. The various types of electronic measuring instrumentation are introduced throughout the course as required.
Prerequisite: ET 102
Co-requisite: MA 103

ET 104 DC and AC Circuits
5 Credits
4 Class Hours, 3 Laboratory Hours
A course for non-electronics majors. The course will include basic electrical fundamentals, the atom electron movement, insulators, conductors, voltage and current. Basic DC Circuits will be covered including Kirchoff’s Law, power, capacitors and inductors in DC circuits. The second portion of the course deals with AC circuits expanding the methods learned in DC with phasor analysis.

Co-requisite: MA 102

ET 105 Seminar 1 Credit
3 Class Hours, 0 Laboratory Hours
A chance for students to hear speakers from industry and learn the role of an engineering technician in local companies.

ET 121 Active Devices I 4 Credits
3 Class Hours, 3 Laboratory Hours
An introductory course in solid-state bipolar devices and the basic circuits in which they are used. Included are semiconductor physics, the junction diode, large signal diode approximation, common emitter approximation, common collector approximation, and large signal operation.

Prerequisite: ET 102

ET 122 Active Devices II 4 Credits
3 Class Hours, 3 Laboratory Hours
An expanded study of solid state circuits and their design including biasing methods, AC operation, cascading of stages, temperature effects, and frequency response.

Prerequisite: ET 121

ET 123 Active Devices III 4 Credits
3 Class Hours, 3 Laboratory Hours
A study of solid state, special purpose devices and the circuits in which they are used. Included are H parameter, field-effect transistors, silicon controlled rectifiers, triacs, diacs, unijunction transistors, varistors, thermistors, varactors, light emitting diodes, opto-electronic devices and integrated circuits.

Prerequisite: ET 122

ET 231 Introduction to Digital Logic 4 Credits
3 Class Hours, 3 Laboratory Hours
A study of basic numbering systems, basic computer codes and Boolean Algebra. The simplification of logic circuits using Boolean Algebra and Karnaugh maps is included. Following combinational logic, a brief study of Sequential Devices is covered.

Prerequisite: ET 121

ET 232 Pulse and Digital Circuits 4 Credits
3 Class Hours, 3 Laboratory Hours
A study of wave-shaping, clipping and clamping circuits, inverter circuits, bi-stable, monostable, and astable multivibrators. Some triggering circuits and the Schmitt Trigger are also included. Laboratory experiments emphasize the investigation and design of all circuits covered.

Prerequisite: ET 121
Co-requisite: ET 231
ET 233 Digital Computer Circuits
4 Credits
3 Class Hours, 3 Laboratory Hours
A study of Computer Systems
including different types of shift
registers and counters. A study of
timing and sequencing operations
is included along with a complete
study of the ALU. Also included are
different types of Memory and
some programming concepts. The
course includes an Introduction to
microprocessors.
Prerequisite: ET 231.

ET 241 Introduction to Rotating
Machines
4 Credits
3 Class Hours, 3 Laboratory Hours
A course designed to give the
student an understanding of
transformers and other magnetic
devices along with a basic
knowledge of the characteristics
and performance of rotating
machines. A comprehensive
treatment of DC motors and
generators, single and polyphase
motors, alternators, and syn-
chronous machines is given.
Prerequisite: ET 102 or ET 104

ET 243 Operational Amplifiers
4 Credits
3 Class Hours, 3 Laboratory Hours
This course presents the
theoretical concepts and practical
parameters that determine the
qualities of IC op Amps such as
their high input resistance, low
output resistance, high gain, and
other attractive features. Included
are differential and operational
amplifier circuits.
Prerequisite: ET 122

ET 244 Energy Systems I
4 Credits
3 Class Hours, 3 Laboratory Hours
A study of the power system and its
components. The parameters of
transmission and distribution
systems, ABCD constants, trans-
mission diagrams and stability are
studied. A student makes
elementary fault analysis and
investigates circuit interrupting
processes and devices. Protection
and instrumentation systems are
introduced with relays and relay
systems.
Prerequisite: ET 103 or ET 104

ET 245 Energy Systems II
4 Credits
3 Class Hours, 3 Laboratory Hours
A course designed for the
technician who will want some
expertise in the electric power
field. The course emphasizes the
generation, distribution and
utilization of large scale electrical
power.
Prerequisite: ET 103, ET 244

ET 251 Introduction to Com-
munications
4 Credits
3 Class Hours, 3 Laboratory Hours
This course is an introductory
study of the various circuits and
devices common to the field of
communications.
Prerequisite: ET 123
ET 252 Communications Systems
4 Credits
3 Class Hours, 3 Laboratory Hours
A course which involves an expanded treatment of the basic circuits covered in ET 251 and develops these concepts into communications systems, i.e., transmitters, receivers, and antennas.
Prerequisite: ET 251

ET 260
3 Credits
1 Class Hours, 6 Laboratory Hours
A projects course in which the student and instructor will identify a research problem to be pursued by the student.
Prerequisite: ET 223 and approval of head of department.
Mechanical Engineering Technology covers many areas of specialization involving the generation, transmission, and utilization of mechanical energy. The curriculum reflects this broad spectrum of subjects ranging from English composition, physics and technical drawing to the laboratory oriented studies of materials science, electronics, thermal science, and instrumentation. The mechanical engineering technician, consequently, is a broadly educated person in great demand who assists the engineer in every phase of research, design and production.

TYPICAL POSITIONS OPEN TO MECHANICAL ENGINEERING TECHNICIANS

As a mechanical engineering technician, one might be involved in:

- **technical sales** — sells and troubleshoots mechanical equipment; has the expertise to advise customers since he/she understands the equipment and can match it with the engineering requirements.

- **engineering aid** — performs tests; collects data; evaluates and makes recommendations for equipment modification, changes or replacements to eliminate technical problems.

- **production** — assists production engineers, design engineers, and maintenance personnel with diagnosing and eliminating problems in process equipment and systems.
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<th>Lab</th>
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Note 1: Chosen from MET options list
Note 2: Chosen from approved Social Science course list
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ME 101 Engineering Materials and Manufacturing Processes
4 Credits
3 Class Hours, 3 Laboratory Hours
A study of modern materials and their production. This course covers the production and fabrication of most common ferrous and non-ferrous metals; hot and cold working; heat treatment; casting, forging, and other forming processes; plastics.
Prerequisite: EN 102

ME 111 Industrial Safety
3 Credits
3 Class Hours, 0 Laboratory Hours
This course covers the area of job-related safety. OSHA compliance, industrial safety philosophies, and engineering factors involved in meeting safety standards are a few of the topics discussed.
Prerequisite: EN 102

ME 124 Shop Practices I
2 Credits
1 Class Hour, 3 Laboratory Hours
This course serves as an introduction to the use of machine tools. Emphasis is placed on “hands-on” experience with the common machine tools; fabrication using welding and sheet metal processes; inspection, measurement, and gauging during the forming process.

ME 125 Shop Practices II
2 Credits
1 Class Hour, 3 Laboratory Hours
This course is a continuation of ME 124 with additional emphasis placed on the more intricate machine elements such as threads and gears.
Prerequisite: ME 124

ME 126 Shop Practices (EET majors only)
2 Credits
1 Class Hour, 3 Laboratory Hours
This course is an introduction into the use of machine tools. Content is the same as ME 124 with the exception that welding techniques have been replaced by copperclad techniques. Limited to Electronic Engineering Technology majors only.
ME 127 Advanced Shop Practices
3 Credits
1 Class Hours, 6 Laboratory Hours
This course builds on the experience of ME 124 and 125 covering more advanced shop fabrication techniques.
Prerequisite: ME 125

ME 131 Statics
4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the branch of mechanics which deals with the effects of forces acting upon a body at rest. Vectors, equilibrium, friction, and center of gravity are some of the concepts studied.
Prerequisite: MA 101
Co-requisite: MA 102, PH 101

ME 132 Dynamics
4 Credits
3 Class Hours, 3 Laboratory Hours
As statics deals with the external forces on a body at rest, dynamics is concerned with the forces on a body which arise because it has motion. Velocity, accelerations, and their relationships to the dynamic forces are discussed in addition to the concepts of work, kinetic energy, momentum, and vibrations.
Prerequisite: ME 131
Co-requisite: MA 103

ME 201 Strength of Materials
4 Credits
3 Class Hours, 3 Laboratory Hours
A study of the internal reactions to external forces. This course deals with how various materials behave when loads or forces act on them. Principles of stress and strain, shear and bending are covered such that a material's strength may be measured or calculated in various load carrying configurations such as beams, columns, compression, or tension structures.
Prerequisite: ME 131

ME 211 Machine Elements I
4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering various elementary machine elements. Bearing design-selection, power shaft design, fastener design, weld design are a few of the topics covered.
Prerequisite: ME 201, ME 132

ME 212 Machine Elements II
4 Credits
3 Class Hours, 3 Laboratory Hours
A study of more advanced machine elements covering camshafts, gears, clutches, flywheels, their applications, analysis, and design.
Prerequisite: ME 211

ME 221 Fluid Mechanics
4 Credits
3 Class Hours, 3 Laboratory Hours
A study of fluid mechanics with emphasis on the use of hydraulics and pneumatics for power transmission. Pumping theory and applications such as the pressure losses in pipes, energy requirements, pressure head, viscosity and flow rate.
Prerequisite: ME 132, MA 103

ME 231 Thermodynamics & Heat Transfer
4 Credits
3 Class Hours, 3 Laboratory Hours
An introductory course in the
fundamentals of applied thermodynamics and heat transfer. Topics covered include the various modes of heat transfer: conduction, convection, and radiation. The principles of refrigeration and the heat engine also will be discussed.

Prerequisite: ME 221
Co-requisite: ET 104

ME 232 Applied Thermodynamics 4 Credits
3 Class Hours, 3 Laboratory Hours
An introductory course in applied thermodynamics. Topics covered include energy transformations, heat units, gas laws, and basic heat engine cycles ranging from the Carnot cycle through the otto, diesel, and gas turbine cycles. Also included are the steam power cycles, refrigeration cycles, steam and refrigerant tables, psychometric chart, Mollier Diagram and thermodynamic applications.
Prerequisite: ME 231

ME 233 Heating and Air Conditioning Technology 4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the calculation of heating and air conditioning loads, ventilation requirements, types of fans, and unit sizing are some of the topics covered.
Prerequisite: Second year standing

ME 241 Instrumentation 4 Credits
3 Class Hours, 3 Laboratory Hours
A course designed to introduce the student to the various mechanical and electronic devices used to measure flow rate, pressure, level, temperature, and other physical quantities.
Prerequisite: Second year standing

ME 251 Metallurgy 4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the properties of metals. Crystalline structure, equilibrium and phase diagrams, heat treatment are a few of the topics studied in relation to mechanical properties of metals.
Prerequisite: ME 101

ME 261 Special Projects 3 Credits
1 Class Hour, 6 Laboratory Hours
A projects course in which the student and instructor will identify a research design problem to be pursued by the student.
Prerequisite: Second year standing

ME 271 Introduction to Solar Energy 4 Credits
3 Class Hours, 3 Laboratory Hours
A course designed to introduce the various types of solar heating systems and their applications. Water and air mediums, active and passive systems, collector sizing, heat storage, available market products, and economic considerations are some of the topics discussed.
Prerequisite: Consent of MET department.
ME 272 Wind and Water Power Systems  
4 Credits  
3 Class Hours, 3 Laboratory Hours  
A course designed to introduce the 
equipment and capabilities of 
power production using wind and 
water power plants. Energy 
storage, electrical systems, water 
flow and or air flow considerations, 
and system performance are a few 
of the topics to be discussed.  
Prerequisite: Consent of MET 
department

DR 100 Introductory Technical 
Drawing  
2 Credits  
6 Laboratory Hours  
A course designed to introduce 
proper use of the drafting equip-
ment, lettering, sketching and line 
quality, surface identification and 
orthographic projection.

DR 101 Technical Drawing  
2 Credits  
6 Laboratory Hours  
An introduction to lettering, 
sketching, instrumental drawing,
orthographic projection, pictorial 
representation, dimensioning 
sections and auxiliary drawing 
with the course slanted toward the 
technology of primary interest to 
the student.

DR 102 Technical Drawing  
2 Credits  
6 Laboratory Hours  
Preparation of detail orthographic 
projections, sections and con-
ventions, auxiliary drawing, 
isometric and oblique drawing. 
Common fasteners and simple 
assembly drawings are also 
covered in this course.  
Prerequisite: DR 101

DR 103 Detail Drawing Layout  
2 Credits  
6 Laboratory Hours  
An introduction to structural 
drawing and detailing, archi-
itectural drawing and detailing, 
axonometric projection, and 
perspective drawing. Major em-
phasis on individual student 
projects employing design, detail, 
and assembly drawing.  
Prerequisite: DR 102

DR 111 Technical Drawing for 
Electronics  
2 Credits  
6 Laboratory Hours  
A brief review of lettering and 
dimensioning. This course will 
cover the drawings of electronic 
symbols, block diagrams, 
schematic diagrams, cable 
drawings, printed circuits boards, 
electro-mechanical drawings, 
wiring diagrams, pictorials, logic 
diagrams, and integrated circuits.
The Industrial Management Technology area has developed in recent years to meet the challenge of production, management and supervision in industry. In order for a manufacturing service or distribution business to be effective, those familiar with various aspects of the business are needed to control its operation.

The chief concern of the industrial management technician is the efficient use of an organization's resources of people, machines, money, and materials. This interest in resource management may lead to activities in product design, improvement, production planning, cost control, labor standards, and literally dozens of other challenging areas. Whether industry needs expanded production or increased efficiency, the industrial management technician is equipped to assist in accomplishing these goals.

**TYPICAL POSITIONS OPEN TO INDUSTRIAL MANAGEMENT TECHNICIANS**

Methods and work standards technician — Improves the effectiveness of manufacturing processes; seeks out and develops processes for achieving safety, economy and efficiency.

Plant layout and production planner — Aids top plant management in planning and locating machines, equipment and materials handling devices.

Quality control technician — Works with quality control personnel to establish and maintain an effective process, product and material quality control program.
## HOURS PER WEEK

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<th>Class</th>
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<th>Hours</th>
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<td>IM 225</td>
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### SIXTH QUARTER

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<td>IM 232</td>
<td>Production Planning and Control</td>
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<td>IM 233</td>
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**TOTAL HOURS: 107**
MID-MANAGEMENT TECHNOLOGY

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<td>IM 132 Personnel Management</td>
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<tr>
<td>IM 211 Motion and Time Study</td>
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<tr>
<td>IM 212 Wage and Salary Administration</td>
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<tr>
<td>IM 221 Plant Layout and Materials Handling</td>
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<td>IM 222 Statistical Quality Control</td>
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<td>IM 223 Engineering Economic Analysis</td>
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<td>IM 224 Methods and Time Measurement</td>
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<td>IM 225 Labor Relations</td>
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<td>IM 231 Supervisory Development</td>
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<td>IM 232 Production Planning and Control</td>
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<td>IM 233 Research Project</td>
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Total: 43 credit hours

BUSINESS

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<td>BU 120 Marketing</td>
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<td>BU 121 Principles of Accounting</td>
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<td>BU 201 Principles of Management</td>
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<td>BU 211 Payroll Procedures</td>
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Total: 22 credit hours

DATA PROCESSING

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Total: 4 credit hours
DRAFTING
DR 100 Introduction to Technical Drawing 2

ECONOMICS
EC 101 Economics 3

ENGLISH
EN 101 Oral Communications 3
EN 102 Patterns of Communication 3
EN 103 Technical Report Preparation 9

MATHEMATICS
MA 141 Business Math I 4
MA 142 Business Math II 4
MA 143 Business Math III 4 12

MECHANICAL ENGINEERING TECHNOLOGY
ME 111 Industrial Safety 3

PHYSICS
PH 100 Introductory Physics 4

SOCIAL SCIENCE
SC Social Science Elective 3

TOTAL HOURS 105
IM 116 Management for First Line Supervisors  3 Credits
3 Class Hours, 0 Lab Hours
This course introduces first-level supervisors to the duties of supervision. It is designed to assist personnel in improving job performance and in preparing for advancement.

IM 131 Methods Analysis  3 Credits
3 Class Hours, 0 Lab Hours
The application of the "questioning attitude" is studied in search for better manufacturing methods and job procedures.

IM 132 Personnel Management  5 Credits
5 Class Hours, 0 Lab Hours
The course is designed to prove an understanding of the basic functions of management used to build and work with an effective and satisfied group of people. Attention is focused on the scope, guiding principles, and background of personnel management.

IM 211 Motion and Time Study  4 Credits
3 Class Hours, 3 Lab Hours
The application of time study, standard data development and formula construction, and work sampling principles and studies will be discussed.

IM 212 Wage and Salary Administration  3 Credits
3 Class Hours, 0 Lab Hours
This course covers the methods used in developing a job evaluation program and the various ways of making wage payments. Consideration is given to the maintenance and control of established programs.

IM 221 Plant Layout and Materials Handling  4 Credits
3 Class Hours, 3 Lab Hours
The study of equipment maintenance, utilization of space, arrangement of stock, machines and aisleways are included in this course. The course surveys material-handling elements, the unit load, packaging, bulk han-
Cost-Volume Relationships, and the Concept of Alternatives. The students will calculate interest, annuity, depreciation, and rate of return on investments. They will compare alternative investments and decisions and evaluate the risk of uncertainty in forecast.

IM 224 Methods — Time Measurement
3 Class Hours, 3 Lab Hours
A course designed to give the student detailed training in the application of work measurement by the MTM technique. Includes the recognition and definition of fundamental work elements with practical applications.

IM 225 Labor Relations
4 Credits
4 Class Hours, 0 Lab Hours
A survey course that reviews the history of the labor movement and current developments. Labor laws will be covered as the student studies allowable management actions during a labor organization activity.

IM 231 Supervisory Development
4 Credits
4 Class Hours, 0 Lab Hours
Applications of modern psychological principles to supervisory problems of training, motivation, and discipline. The supervisor's role as a morale builder and the importance of understanding, empathy, and proper counseling will be discussed.

IM 232 Production Planning and Control
4 Credits
3 Class Hours, 3 Lab Hours
A discussion of the most economical methods, machines, operations, and materials for the manufacture of a product. Also covered is the planning, scheduling, routing, and detailed procedure of production control.

IM 233 Senior Research Project
2 Credits
0 Class Hours, 6 Lab Hours
A report written on a project which has been selected by the student and approved by the instructor.
The Related Studies Department provides the foundations for a solid technical background. Each course has been designed to provide basic information necessary to the technician. The department heads of each technology have assisted in determining both course content and sequence of curriculum. The related areas are English, social science, mathematics, and physics.

ENGLISH

The English program promotes mastery of the skills of reading, writing, listening, speaking and reporting — all essential tools of the technician. The practical aspects of communication — grammar, spelling, and vocabulary — are emphasized as needed to aid the student in developing sound techniques of collecting and presenting data.

SOCIAL SCIENCES

The social science and psychology courses seek to prepare students to deal effectively with situations and problems encountered in a growing technical society. Emphasis is on practical knowledge and skills.

MATHEMATICS

Mathematics courses stress the development of both computational skills and reasoning ability in the solution of technological problems. The curriculum presents concepts and processes of mathematics which are vital to scientific and technological progress.

PHYSICS

Physics courses are designed to offer students working knowledge of the basic principles of mechanics, heat, sound, electricity, light, magnetism, and other areas upon which all technological processes depend. An understanding of basic physical laws is essential for the technician to maintain a proper perspective toward his work, which extends to the successful handling of new and unfamiliar tasks.

Related Studies requirements are listed in the appropriate section for each technology.
RELATED STUDIES
Course Descriptions
ENGLISH

EN 100 Basic Writing Skills
3 Credits
3 Class Hours
A course designed to improve the individual student's basic writing skills, particularly in the areas of sentence structure and logical development of ideas. Grammar is studied as necessary to promote clarity and logic.

EN 101 Oral Communications
3 Credits
3 Class Hours
This course affords the student an opportunity to develop listening and speaking skills. The initial emphasis on interpersonal and intrapersonal communication evolves into the assignment of formal speeches, which are videotaped to facilitate self-criticism.

EN 102 Patterns of Composition
3 Credits
3 Class Hours
A course focusing on the basic patterns of writing of use to the technician, with emphasis upon accuracy, clarity, and conciseness. The use of resources, development of a technical vocabulary, and a minimal review of grammar and spelling are employed as needed.

EN 103 Technical Report Preparation
3 Credits
3 Class Hours
A course in organizing and preparing various types of technical communiques and reports, including memoranda, business letters, abstracts, oral reports, semiformal and formal technical reports.
Prerequisite: EN 102

EN 213 Business Communications II
3 Credits
3 Class Hours
A course designed to increase the student's skill in writing letters, memoranda, and short reports. The art of recognizing problem situations and seeking effective solutions is emphasized, along with vocabulary study and analysis of stylistic trends.
Prerequisite: EN 201, 212

MATHEMATICS

MA 100 Elementary Algebra
5 Credits
5 Class Hours
Intended to provide a basic knowledge of algebra and to build skills in the use of the more elementary aspects of mathematics, the course emphasizes the solving of problems in technical areas. Topics include
arithmetic review, elementary algebra and geometry.

MA 101 Algebra and Trigonometry I
5 Credits
5 Class Hours
An integrated treatment of algebra and trigonometry covering linear and quadratic equations, functions and graphs, factoring systems of linear equations, trigonometric functions, and solving right and oblique triangles.

MA 102 Algebra and Trigonometry II
5 Credits
5 Class Hours
A continuation of MA 101 including exponents and radicals, logarithms, complex numbers, inequalities, variations, equations of higher degree and trigonometric identities and equations.
Prerequisite: MA 101

MA 103 Applied Calculus
4 Credits
4 Class Hours
A presentation of the basic concepts of differentiation, integration and their applications to the physical sciences and engineering. Also included are selected topics from plane analytic geometry.
Prerequisite: MA 102

MA 104 Geometry
4 Credits
4 Class Hours
A course intended to enhance the student's comprehension of the conceptual structures, form and size, and their communication and manipulation by means of symbols. Topics covered include plane figures and their measurement, triangles and circles, geometric solids, cylinders, pyramids, cones and spheres.

MA 140 Computation
5 Credits
5 Class Hours
A study of the basic topics of arithmetic with emphasis on their practical uses. The following topics are included: Place value, whole numbers, rational numbers, decimal numbers, ratio and proportion, percent and measurement.

MA 141 Business Mathematics I
4 Credits
4 Class Hours
An introduction to algebra with emphasis on solving first degree equations.

MA 142 Business Mathematics II
4 Credits
4 Class Hours
Mathematical systems are analyzed and structures of mathematics are examined. Relations and operations and additional topics from algebra are presented.
Prerequisite: MA 141

MA 143 Business Mathematics III
4 Credits
4 Class Hours
A presentation of probability models and statistical techniques and their applications.
Prerequisite: MA 142

MA 151 Scientific Calculations
4 Credits
4 Class Hours
A course designed for the student
to learn to use the tools of mathematics efficiently and effectively in application to the basic physical sciences. Topics include review of algebraic operations, logarithms, conversions, systems of measure, preparations of solutions, pH, and colorimetry.

Prerequisite: MA 101

MA 191 Introduction to Algebra & Trigonometry I
4 Credits
4 Class Hours
This course introduces the basic mathematics required for students in technical and pre-engineering technology programs. Course topics include scientific notation, basic algebra, functions, and graphs, introductory trigonometry, systems of equations, factoring and algebraic fractions.

Prerequisite: MA 100

MA 192 Introduction to Algebra & Trigonometry II
4 Credits
4 Class Hours
A continuation of MA 191, including quadratic equations, trigonometric functions of any angle or number, vectors and oblique triangles, graphs of trigonometric functions, exponents, and radicals.

Prerequisite: MA 191

MA 204 Probability and Statistics
3 Credits
3 Class Hours
An introduction to the basic principles of statistics and probability. Topics include visual description of data, measures of location, measures of variation, sampling, probability and sampling distributions.

Prerequisite: MA 102 or MA 143

PHYSICS

PH 100 Introductory Physics
4 Credits
3 Class Hours, 3 Laboratory Hours
An introductory study of selected topics in physics involving a minimum of mathematics. Topics discussed include energy, basic electricity, wave motion and light, and physics of the atom as well as some interesting recent developments in physics.

Prerequisite: MA 140

PH 101 Physics of Mechanics
4 Credits
3 Class Hours, 3 Laboratory Hours
This course provides an introduction to the basic concepts and principles of general physics. The course covers the major topics of mechanics including vectors, Newton's Laws, work, energy, circular motion, simple machines, impulse, and momentum. The laboratory parallels class work and will be used to illustrate lecture principles.

Co-requisite: MA 101

PH 102 Physics of Electricity and Magnetism
4 Credits
3 Class Hours, 3 Laboratory Hours
Basic laws and theories of electricity and magnetism. Electric and magnetic fields, electric potential, DC circuits, electromagnetic induction, and an introduction to AC circuits are topics covered. Laboratory work closely parallels class work.
Prerequisite: PH 101 and MA 101

PH 103 Physics of Heat, Light and Sound  
4 Credits  
3 Class Hours, 3 Laboratory Hours  
An introduction to wave motion, sound, thermodynamics, light and optics.  
Prerequisite: PH 101 and MA 101

READING

RD 100 Study Skills Improvement  
4 Credits  
4 Class Hours  
Explanation and applications of the SQ4R method of studying (Survey, question, read, recite, rite, review) plus other techniques to help the student study more efficiently.

RD 101 Reading Improvement  
4 Credits  
4 Class Hours  
This course is designed to help students improve comprehension in reading, speed, and vocabulary. Emphasis is also placed on stimulating a lasting interest in independent study.

RD 102 Technical Reading  
3 Credits  
3 Class Hours  
This course introduces the student with at least average reading ability to special skills and techniques needed to read technical material. Topics covered include the use in technical writing of examples, classification, contrast, illustrations, and specialized vocabulary.

SOCIAL SCIENCES

PS 151 Developmental Psychology I  
4 Credits  
4 Class Hours  
This course is specifically designed for Allied Health majors and acquaints the students with concepts and theories of psychological development from infancy through adolescence. Emphasis is placed upon psychological implications and treatments of both mental and physical illness during this period.

PS 152 Developmental Psychology II  
4 Credits  
4 Class Hours  
A continuation of PS 151 including the concepts of development through adulthood and old age. Emphasis is placed upon psychological implications of illness, old age, and dying.  
Prerequisite: PS 151

SC 101 Human Relations in Industry  
3 Credits  
3 Class Hours  
An experiential study of human interaction in the business and industrial complex. Emphasis is placed on the necessity of a cooperative environment to satisfy individual needs and to increase productivity.

SC 102 Applied Psychology  
3 Credits  
3 Class Hours  
An introduction to those general principles of psychology which are most applicable to the everyday lives of students, emphasizing the transactional analysis approach.
EVENING AND SPECIAL PROGRAMS
The Evening and Special Programs serve as an extension of State Tech to meet the needs of the working students of Knoxville and the surrounding area. All courses offered regularly in the day school may be offered in the evening program upon sufficient demand. In addition to the credit courses leading to the Associate Degree in each technology, special college credit and non-credit courses reflecting the needs of business, industry, schools, or governmental agencies may be organized at the request of a sufficient number of interested persons.

CERTIFICATE PROGRAMS
Certificate in Emergency Medical Technology
A one-year certificate program which trains Emergency Medical Technicians-Advanced Paramedics in the East Tennessee region to administer advanced emergency care under the direction of a physician to victims of accidents and in acute medical emergencies. There is a great need to provide advanced life support for patients with critical care needs who are being transferred into tertiary care hospitals.

Certificate in Water and Wastewater Technology
A one-year certificate program which provides training in the appropriate areas and prepares the student for the certification exam for class 1, 2, and 3 water and wastewater treatment plant operators. This program has been developed in conjunction with the local CETA prime sponsor and is funded by that organization. This program trains full-time and part-time water and wastewater treatment plant technicians for the Knoxville and surrounding municipalities and industries.

Certificate in Photography
This program consists of a wide selection of courses in photography and encompasses all aspects of still photography, darkroom techniques, and creative techniques including commercial applications of photography.

Certificate in Banking
State Tech in cooperation with the Knoxville Chapter of the American Institute of Banking offers AIB national curriculum courses to employees of the banking industry. Thus, the student can not only complete AIB requirements but also receive college credit hours. The courses are taught by instructors who meet both the college and chapter qualifications.

Certificate in Radio and TV Production
Emphasis is placed on the programming aspects of the industry; however, all jobs encountered at most radio and TV stations will be touched on. Students will work on news, announcing, and production techniques, using local radio and TV facilities.

Certificate in Real Estate
The real estate certificate program was designed for the local real estate industry in compliance with the teaching objectives
established by the Tennessee Real Estate Commission. The program satisfies the education requirements of the Tennessee Real Estate Broker's License Act of 1973, Section 62-1316 paragraph F for brokers and for affiliate brokers. It is a flexible program and allows an individual to specialize in any one of three areas.

*At this time, courses are open only to individuals employed by the banking industry.*
EVENING AND SPECIAL PROGRAMS
Emergency Medical Technician —
Advanced (Paramedic)
Curriculum and Course Descriptions
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<td>EM 201 The EMT — Advanced</td>
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<td>EM 202 Human Systems and Patient Assessment</td>
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<td>EM 210 Shock and Fluid Therapy</td>
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<td>MA 105 Mathematics for Pharmacology</td>
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<td>EM 240 Soft Tissue Injuries</td>
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<td>EM 241 Medical Emergencies</td>
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SUMMER QUARTER
EM 243 Pediatrics and Neonatal Care 3 3 4
EM 250 Rescue Techniques 1 3 2
EM 251 Telemetry and Communications 1 3 2
EM 252 Emotionally Disturbed Patient 3 0 3
EM 232 Clinical 0 9 3

8 17 14

MA 105 Mathematics for Pharmacology 3 Credits
3 Class Hours, 3 Laboratory Hours

This course readies individuals to prepare various dosages of medications. It serves as a math review of basic math principles, including ratio and proportion, decimal to fraction conversion and metric weights and measures.

EM 201 The Emergency Medical Technician (EMT) — His Role 2 Credits
2 Class Hours, 0 Laboratory Hours

The role of the Emergency Medical Technical-Paramedic in the health care delivery system is discussed. The duties and responsibilities of the EMT as well as any legislation affecting her job performance are covered. In addition the students discuss issues concerning the EMT, including medical ethics and reaction to death and dying.

EM 202 Human Systems and Patient Assessment 5 Credits
4 Class Hours, 3 Laboratory Hours

This course includes an overview of anatomy and physiology of each system of the body. The use of medical terminology and the construction of medical terms using roots, prefixes are also included. In addition, the course deals with the procedure for a patient assessment, including the patient’s medical history, physical examination, and transfer of collected information to the supervising physician.

EM 210 Shock and Fluid Therapy 4 Credits
3 Class Hours, 3 Laboratory Hours

Included in this course is a discussion of the fluids and electrolytes in the body with emphasis being placed upon the
manifestation of fluid and electrolyte imbalances. The manifestations of dehydration and overhydration are also included. The course also deals with the causes, signs, and symptoms of shock, fluid administration through intravenous techniques, and the application of the Medical Anti-Shock Trousers (M. A. S. T.)

EM 215 General Pharmacology
3 Credits
3 Class Hours, 0 Laboratory Hours
This course is designed to introduce the student to the general groups of drugs and the classification of each. The course also discusses the kind of information the student should know about each drug, specifically therapeutic effect, indications, contraindications, correct dosage, and side effects. In addition, the course deals with the calculation of dosages, the use of the metric system, and the administration of drugs through the various routes.

EM 220 Respiratory System
6 Credits
5 Class Hours, 3 Laboratory Hours
This course begins with a discussion of the anatomy and physiology of the respiratory system and the assessment of a patient with suspected respiratory distress. Pathophysiology, including respiratory arrest, upper airway obstruction, obstructive airway diseases, toxic inhalations, pulmonary edema, hyper-ventilation syndrome, pulmonary embolism, and trauma, are also discussed. Techniques of management of the previously defined include oxygen administration, use of adjunctive equipment, direct laryngoscopy, endotracheal intubation, esophageal obturator airway, and suctioning, among others.

EM 221 Cardiovascular System
6 Credits
5 Class Hours, 3 Laboratory Hours
The course begins with a discussion of the anatomy and physiology of the cardiovascular system, with emphasis upon the structure, function and electrical conduction system of the heart. Then the assessment of the patient with suspected cardiovascular problem is discussed. Pathophysiology is also discussed, including coronary artery disease and angina, acute myocardial infarction, cardiogenic shock, syncope, trauma, and hypertensive states. In addition, the course deals with the interpretation and treatment of basic arrhythmias. Specific techniques covered include cardiopulmonary resuscitation, electrocardiographic monitoring, defibrillation, phlebotomy, carotid sinus massage, intracardiac injection, transcutaneous pacemakers, and use of mechanical heart-lung resuscitators.

EM 222 Central Nervous System
1 Credit
1 Class Hour, 0 Laboratory Hour
This course includes the anatomy and physiology of the nervous system and the procedure for the assessment of a patient with a
nervous system disorder. The pathophysiology and management of patients presenting with CNS trauma, seizures, cerebrovascular accident are discussed. In addition, management of the comatose patient is covered. Specific treatment discussed include spinal immobilization in cases of trauma and the administration of diazepam in cases of seizures.

EM 223 Musculoskeletal System
4 Credits
3 Class Hours, 3 Laboratory Hours
This course includes the anatomy and physiology of the musculoskeletal system, patient assessment, and management of sprains, strains, fractures and dislocations. Skills presented include splinting and immobilization techniques with the traction splint, air splint and board splint.

EM 230-231-232 Clinical Training
9 Credits
0 Class Hours, 27 Laboratory Hours
This part of the program is comprised of time spent in various area hospitals, clinics, field trips, etc. Major emphasis will be placed on Coronary care, intensive care, emergency room, labor and delivery, morgue, pediatrics, operating room, recovery room, psychiatric units, and ambulance experience.

EM 240 Soft Tissue Injuries
3 Credits
3 Class Hours, 1 Laboratory Hour
This course includes the anatomy and physiology of the integument and the assessment and management of soft tissue injuries, including abrasions, lacerations, punctures, avulsions, burns and impaled object. Skills presented in this course include control of hemorrhage and the dressing and bandaging of specific injuries. Also, injuries to specific regions, including the eye, face, neck and abdomen, are discussed.

EM 241 Medical Emergencies
3 Credits
3 Class Hours, 0 Laboratory Hours
This course includes the identification and management of diabetic emergencies, anaphylactic reactions, exposure to environmental extremes, alcoholism, poisoning, acute abdomen, genito-urinary problems, and medical emergencies of the geriatric patient.

EM 242 Obstetric Gynecologic Emergencies
3 Credits
3 Class Hours, 0 Laboratory Hours
This course includes the anatomy and physiology of the female reproductive system and the technique for assessment of a patient with suspected obstetric and gynecologic disorder. The course also includes the management of an expectant mother, normal delivery, and the care and transportation of the mother and newborn. Abnormal deliveries such as multiple births, premature birth, breech birth and prolapsed umbilical cord are discussed. In addition, complications of labor and delivery, including post-partum hemorrhage, ruptured uterus,
Eclampsia, and infant resuscitation are reviewed.

**EM 243 Pediatrics and Neonatal Care**  
4 Credits  
3 Class Hours, 3 Laboratory Hours  
This course deals with the unique aspects of assessing pediatric patients. It also includes the pathophysiology and management of problems which are primarily seen in pediatric patients, including asthma, bronchiolitis, croup, epiglottis, sudden infant death syndrome and seizures in the pediatric age group. In addition, the course discusses the role of the EMT in a system for a neonatal transport. The specific skills included are a review of infant resuscitation, intravenous techniques and tracheal intubation on the infant.

**EM 250 Rescue Techniques**  
2 Credits  
1 Class Hour, 3 Laboratory Hours  
This course emphasizes gaining access to the patient, disentanglement, and ultimate transport of the patient. Techniques of tying ropes, knots and hitches are included. The recognition and control of hazards such as explosive materials, downed electrical wires, toxic gases, and radiation are included. In addition, techniques for lifting, packaging, and transporting patients in emergency and non-emergency situations are discussed.

**EM 251 Telemetry and Communications**  
2 Credits  
1 Class Hour, 3 Laboratory Hours  
This course deals with the use of radio communications equipment including the transmission of voice communications and EKG transmission. The course also includes a discussion of the regulations established by the Federal Communications Commission with respect to use of radio equipment. In addition, the course deals with the protocols and procedures for the transfer of information to the supervising physician.

**EM 252 Management of the Emotionally Disturbed Patient**  
3 Credits  
3 Class Hours, 0 Laboratory Hours  
This course discusses the various kinds of psychological problems the EMT might encounter, and specific procedures for handling each are included.
# FIRST QUARTER

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<td>MA 100 Elementary Algebra</td>
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<td>BI 104 General Ecology</td>
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Weekly Total: 29  14  18  
Quarterly Total: 290 140 180 17

# SECOND QUARTER

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<tr>
<th>Course</th>
<th>Clock</th>
<th>Class</th>
<th>Lab</th>
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<tr>
<td>SC 102 Applied Psychology</td>
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<tr>
<td>PH 100 Introductory Physics</td>
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<td>3</td>
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<tr>
<td>CH 151 Introductory Chemistry</td>
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<td>MA 191 Algebra and Trigonometry I</td>
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<tr>
<td>WT 102 Hydraulics &amp; Pumping Design</td>
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<tr>
<td>WT 106 On-the-Job Training</td>
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Weekly Total: 40  16  26  
Quarterly Total: 400 160 260 21

Continued on page 114.
### THIRD QUARTER

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<th>Course</th>
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<tr>
<td>MB 101 Microbiology I</td>
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<tr>
<td>CH 153 General Chemistry</td>
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<tr>
<td>MA 192 Algebra &amp; Trigonometry II</td>
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<tr>
<td>WT 103 Advanced Water and Wastewater Tech.</td>
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<td>WT 107 On-the-Job Training</td>
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Weekly Total: 39
Quarterly Total: 390

### FOURTH QUARTER

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<td>MB 102 Microbiology II</td>
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<td>CH 111 Inorganic Chemistry I</td>
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<td>PH 101 Physics of Mechanics</td>
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<td>WT 104 Advanced Waterworks Tech.</td>
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<tr>
<td>WT 108 On-the-Job Training</td>
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Weekly Total: 41
Quarterly Total: 410

### WT 101 Operations, Maintenance, Safety

3 Credits
3 Class Hours, 0 Laboratory Hours

A stimulation of interest in the field of Water and Wastewater Technology is the objective of this course. This course is designed to teach the student basic fundamental principles and practices in wastewater treatment systems. Included in this course will be wastewater characterization, wastewater treatment methods, sludge handling, chlorination of wastes, treatment of industrial wastes, problem solving, dimensional analysis, and engineering laboratory practices.

### WT 102 Hydraulics and Pumping Design

3 Credits
3 Class Hours, 3 Laboratory Hours

This course is designed to cover fundamental design principles and practices in wastewater collection systems, how to characterize wastewater, and an introduction to physical unit operations. Topics covered include determination of wastewater flow rates, hydraulics
of collection systems, design of collection systems, pumps, wastewater characteristics, and physical unit operations.

**WT 103 Advanced Water and Wastewater Technology Theoretical and Operational Aspects — Techniques and Industrial Problems** 3 Credits 3 Class Hours, 0 Laboratory Hours

This course provides the theoretical basis and practical laboratory experience necessary to perform chemical examinations of water and wastewater. Topics covered include turbidity, color, standard solutions, pH, acidity, alkalinity, coagulation, hardness, residual chlorine, chloride demand, and dissolved oxygen.

**WT 104 Advanced Waterworks Technology — Theoretical and Operational Aspects** 3 Credits 3 Class Hours, 0 Laboratory Hours

This course provides the theoretical basis and practical laboratory experience necessary to perform chemical and physical examinations of water and wastewater. Topics covered include BOC, COD, nitrogen, solids, grease, activated sludge analysis, and phosphate.

**MB 101 Microbiology I** 4 Credits 3 Class Hours, 3 Laboratory Hours

Microbiology I is a basic course in microbiology with emphasis on the microorganisms found in water and wastewater.

**MB 102 Microbiology II** 4 Credits 3 Class Hours, 3 Laboratory Hours

A continuation of Microbiology I with emphasis on applied microbiology.

**BI 104 General Ecology** 3 Credits 3 Class Hours, 3 Laboratory Hours

This course will consist of a survey of environmental problems and how the application of knowledge and understanding may be applied to these environmental problems. Relations between organisms and their environment, including human environmental problems, will be specifically investigated.

**WT 105-108 On-the-Job Training** 3 Credits per course 0 Class Hours, 20 Laboratory Hours

The purpose of this training is to assist the student in learning the normal operational procedures for a wastewater and water plant and to actually perform the procedures. He will learn to recognize emergency conditions of the waste stream and the course of these conditions, to carry out the preventive maintenance procedures, and to recognize when corrective maintenance procedures are required. Safety features for the above operations will be stressed. Also, the student will learn how to prepare reports necessary for the plant's operations.
EVENING AND SPECIAL PROGRAMS
Other Course Options for Evening Students and Industry
AV 111 Still Photography I
3 Credits
3 Class Hours
A beginning class in the study of the camera, film, lighting, composition, black and white film processing, contact printing and enlarging.

AV 112 Still Photography II
3 Credits
3 Class Hours
Advanced work in lighting, camera controls, and use of lenses. Special topics include slide copying, internegatives, and copy prints.

AV 113 Darkroom Techniques
3 Credits
3 Class Hours
The study of developers for film and paper, developing techniques, and how they relate to contrast and grain. Topics covered are: how surfaces and textures relate to subject and mood; and printing controls, including cropping and burning-in.

AV 114 Creative Darkroom
3 Credits
3 Class Hours
Study of special techniques: solarization, bas relief, photo montage, heat distortion, Kodalith, and posterization.

AV 115 Advanced Darkroom
3 Credits
3 Class Hours
This course is designed for persons who have completed Darkroom Techniques successfully and wish further study in black and white printing techniques. The emphasis will be on producing professional quality prints.

AV 116 Color Reversal Printing
3 Credits
3 Class Hours
The study of color printing directly from slides, with darkroom experience in the additive printing system.

AV 117 Cable Television Production
3 Credits
3 Class Hours
An introductory course which offers practical application of television techniques in production design, lighting, audio, graphics, titles, camera techniques, video switching, electronic video editing, and elementary technical knowledge of video electronics.

AV 118 Color Negative Printing
3 Credits
3 Class Hours
The study of printing techniques from a color negative with darkroom experience in the subtractive printing system.

AV 119 Introduction to Cinematography
3 Credits
3 Class Hours
A beginning course in fundamentals of planning, shooting, and editing a movie. Subjects such as camera controls, lighting, film stock, cutting and splicing, composition, storyboards, titles, and animation will be discussed.

AV 120 Audio Recording Production
3 Credits
3 Class Hours
Approach of the class will be to show why and how to use more advanced recording equipment. There will be demonstrations of studio set-ups, including
microphone placement and the use of acoustical baffles. Students will operate tape recorders, mixing consoles, echo chambers, and limiters. Demonstration sessions will be arranged.

AV 121 Multi-Media Production
3 Credits
3 Class Hours
Capabilities and advantages of multi-media presentations are discussed. Specific kinds of information most effectively presented are covered. Planning a multi-media presentation is covered in detail. If there is sufficient interest, a three-screen, slide-projector, multi-media program will be made by the class.

AV 122 Audio Workshop
3 Credits
3 Class Hours
An advanced class designed for students who have completed Audio Recording Production. The emphasis will be on multi-track recording.

AV 123 Nature Photography
3 Credits
3 Class Hours
Basically a field course designed for the beginner in nature photography. This course will include techniques for lighting and photographing many plants and animals, both in the field and the studio.

AV 124 Darkroom Workshop
3 Credits
3 Class Hours
Designed for the advanced student to furnish black and white lab time and critique for the development of a one-person show or portfolio.

IM 116 Management for First Line Supervisors
3 Credits
3 Class Hours
This course is constructed to introduce and orient a new first-level supervisor and the middle manager to the duties of supervision. It is designed to improve the performance of personnel on these jobs and to prepare them to advance to higher positions. It is also a good refresher course for a supervisor who has been on the job for some time and desires to acquire new knowledge of concepts for dealing with personnel.

DR 191 Basic Blueprint Reading
3 Credits
3 Class Hours
An introduction to interpreting blueprints. This course is designed to give the student a good foundation in determining dimensions and the designer's intent in layout by use of symbols, sections, elevations, plans and details. The course will include construction drawings in structural steel, reinforced concrete, timber, electrical, and mechanical installation.

DR 192 Advanced Blueprint Reading
3 Credits
3 Class Hours
Using the basic blueprint reading course as a foundation, this advanced course will develop with greater detail the student's understanding of architectural, structural, mechanical, and electrical drawings. Course material will include but not be limited to an indepth study of both
a reinforced concrete and a steel structure. Using shop drawings, slide presentations, and field trips to the structures under study, the students will obtain a better understanding of the factors involved in reading prints.

**EM 110 First Aid for Industry**

- **1 Credit**
- **9 Class Hours**

This course is designed to provide instruction in first aid practices for industry. Upon completion of the course, the student should be able to give immediate first aid care to injured individuals and satisfy OSHA and TOSHA requirements stipulating that a percentage of workers with industry be trained in first aid. Successful completion of the course will earn certification in the American Red Cross, Standard First Aid Multimedia System.

**EN 140 ABC’s of Sign**

- **3 Credits**
- **3 Class Hours**

This course is designed for supervisors and workers who come in contact on a day-to-day basis with individuals who can neither hear nor speak and must use their hands for communication. By learning SIGN, supervisors and co-workers will be able to communicate more effectively with employees who have speech and hearing disabilities. This in turn, will aid the worker with a disability to be a more productive person through improved communications. Course objectives: learn basic sign; learn manual alphabet and the correct way of making each letter with your hands; be able to read sign from other people; combine letters to form words; words to form sentences.

**EN 214 Business Letter Writing for Managers**

- **3 Credits**
- **3 Class Hours**

Course designed to make letter writing easier and improve business communications. It deals with eliminating outdated and overused words and phrases; punctuation and grammar; different types of business letters; improving dictation methods; and time-saving methods.

**ET 198 Industrial Electricity**

- **3 Credits**
- **3 Class Hours**

This course is specifically designed for persons working as industrial electricians in the industrial environment or toward that goal. It can provide refresher background for those with some experience or serve as a starting point.

**ET 199 Amateur Class Radio (FCC Preparation)**

- **3 Credits**
- **3 Class Hours**

Students are taught basic radio theory, government regulations, and training in the International Code. Student will work on news, announcing, and production techniques. Also covered in the classroom sessions are FCC license requirements, program log keeping, music selections, contests, and promotions. Novice and general classes are taught.

**HS 306 Investments and Family Management**

- **3 Credits**
- **3 Class Hours**

Various aspects of investment principles and their application to
family finance are discussed: yields, limited income securities, investment markets, valuation of common stock, family budgeting, property and liability insurance mutual funds, and variable annuities.

**IN 111 Basic Insurance Procedures**  
3 Credits  
3 Class Hours  
This course introduces the student to the history and terminology of insurance, including the structure of the general insurance business and the policy as a legal contract. Coverages discussed include fire policies, commercial fire, personal and commercial auto, general liability, inland marine, glass, crime, package policies, workers compensation, fidelity and surety coverages, and life, accident and health.

**IN 121 General Principles of Insurance**  
3 Credits  
3 Class Hours  
Basic principles that underlie the entire field of insurance, as well as the nature and operation of the insurance business.

**IN 122 Advanced Property Insurance**  
3 Credits  
3 Class Hours  
Primary emphasis is placed on understanding coverages, policy provision, and concepts common to property insurance. Contracts and forms studied include the standard fire policy, extended coverage endorsement, dwelling and contents forms, bailees' customers policy, and the property coverages provided by multiple line contracts.

**IN 123 Casualty Insurance**  
3 Credits  
3 Class Hours  
This course studies coverages, policy provisions, and concepts common to Liability insurance policies, suretyship, and liability insurance aspects of multiple-line contracts, and life, health, and social insurance coverages.

**ME 190 Industrial Safety**  
3 Credits  
3 Class Hours  
American industry has two jobs to perform in the safety area. First, it must provide a safe environment from a production standpoint. Since the enactment of the Occupational Safety and Health Act of 1970, it also has a new job of law compliance. It is the intent of this course to introduce the student to the concept of industrial safety and draw together some approaches to the problem of complying with OSHA.

**ME 191 Fluid Power I**  
3 Credits  
3 Class Hours  
A study of fluid mechanics with emphasis upon the use of hydraulics and pneumatics for power transmission and control purposes. This course covers fluids and their properties, hydraulic principles on linear systems, seals and packings, and an introduction to pneumatics.

**ME 192 Fluid Power II**  
3 Credits  
3 Class Hours  
As a continuation of ME 191, this course covers the techniques for calculating the fluid flow rates and velocities in a given fluid system.
methods for calculating the total energy in a fluid system, laminar and turbulent flow, and friction factors and pressure drops in systems.

ME 193 Precision Instrument and Blueprint Reading  2 Credits  2 Class Hours
This course is designed to provide the student with the basic understanding and proper use of precision measuring instruments, involving elementary blueprint reading. This course will enable the student to visualize and draw elementary three-dimensional views of a machine part, read various precision measuring instruments, judge both bilateral and unilateral tolerances, and inspect a machine part from a blueprint.

PA 199 Parliamentary Procedure  3 Credits  3 Class Hours
How to lead or participate in a business meeting is the purpose of this course. Especially aimed at club or organization members and officers, the course will cover

Robert's Rules of Order. Students will be involved in actual practices of parliamentary procedure.

RE 101 Essentials of Real Estate  3 Credits  3 Class Hours
The fundamental principles underlying real estate brokerage activities are examined to provide a broad foundation for students interested in the area of real estate and to provide sufficient coverage of materials for mastery of the Tennessee Real Estate Commission licensing examinations. This course is taken concurrently with RE 201.

RE 201 Mathematics, Contracts, and Closing Lab  1.5 Credits  1.5 Class Hours
Arithmetic calculations normally associated with real estate brokerage activities, sales contracts, and closing papers will be developed in this study laboratory. Through a combination of instructor, lecture, development of model problems, and practical problems and exercises, the

students can concentrate their learning efforts in those areas where they require greater levels of expertise. Students are advised to take this course concurrently with RE 101 as preparation for the affiliate broker's examination.

RE 113 Real Estate Law  3 Credits  3 Class Hours
The legal bases, ramifications, and standing of real property contract instruments are studied in view of common law precedents, federal state statutes and miscellaneous agency interpretations. This course will also investigate at length the implications of ethical conduct standard behavior as it relates to the brokerage of real property.

RE 118 Real Estate Salesmanship  3 Credits  3 Class Hours
A course designed to acquaint the student with the attitudes and philosophies of real estate sales management. The course includes planning, performance and
evaluation of sales people and the sales organization. Role playing will be utilized to insure that the student develops proper procedures for effective sales procurement.

RE 203 Advanced Closing Lab
3 Credits
3 Class Hours
Real estate brokerage sales statement and loan closing statements are studied in detail. Closing problems dealing with the proration of taxes and insurance, disbursement of funds, handling of fees and escrow accounts, etc., are taken from actual situations. The requirements of the Real Estate Settlement and Procedures Act of 1974 are examined. This course may be substituted for RE 201.

RE 210 Residential Appraising
3 Credits
3 Class Hours
This course introduces the student to three methods of appraising residential property: comparative sales, unit cost, and gross rent multiplier. Basic concepts such as the purposes of appraisals, value of property, neighborhood and site analysis, and market conditions are covered using appraisal terminology. Students will appraise their own and their classmates' properties as well as properties of decidedly high and low economic values. All three appraisal methods will be used, but emphasis will be placed on the comparative sales approach.

RE 233 Real Estate Finance
3 Credits
3 Class Hours
Basic sources of lending in the field of residential and income property are covered, including FHA, VA and conventional loans and sources of commercial loans for income property. Interim construction financing is also covered. Discussion of current events and trends in the housing and money markets are used to highlight the concepts.

RE 235 Real Estate Investments
3 Credits
3 Class Hours
The fundamental principles underlying successful real estate investments are examined. Finding opportunities, types of ownerships, income taxation and financing considerations are covered to enable the student to become more knowledgeable and successful in investing.

RE 244 Land Development, Marketing, and Use Regulations
3 Credits
3 Class Hours
The planning, development, marketing and land use strategies necessary to insure success in residential land development pertaining to clusters, planned unit developments, and regional development; road layout and lot sizing; and marketing strategies. In addition, the basic philosophies of land use, enabling legislation, zoning and subdivision ordinances, administrative policies and current environmental protection controls are reviewed.
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