-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.

3435 Division Street
KNOXVILLE, TENNESSEE 37919
(615) 637-4262
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ACADEMIC CALENDAR 1977

Winter Quarter 1977
Registration and Orientation  January 3
Classes meet as scheduled  January 6
Last day to register or add a class  January 7
Last day to drop a class  January 26
Last day to withdraw  March 1
Classes End  March 15
Final Exams  March 16-18

Spring Quarter 1977
Registration and Orientation  March 28
Classes meet as scheduled  March 30
Last day to register or add a class  April 1
Good Friday Holiday  April 8
Last day to drop a class  April 20
Last day to withdraw  May 24
Classes End  June 7
Final Exams  June 8-10
Commencement Exercises  June 11

Summer Quarter 1977
Registration and Orientation  July 5
Classes meet as scheduled  July 6
Last day to register or add a class  July 11
Last day to drop a class  July 27
Last day to withdraw  August 30
Labor Day Holiday  September 5
Classes End  September 13
Final Exams  September 14-16

Fall Quarter 1977
Registration and Orientation  September 26
Classes meet as scheduled  September 28
Last day to register or add a class  September 30
Last day to drop a class  October 19
Last day to withdraw  November 22
Thanksgiving Holidays  November 24-27
Classes End  December 6
Final Exams  December 7-9
Winter Quarter 1978
Registration and Orientation
Classes meet as scheduled
Last day to register or add a class
Last day to drop a class
Last day to withdraw
Classes End
Final Exams

Spring Quarter 1978
Registration and Orientation
Classes meet as scheduled
Last day to register or add a class
Last day to drop a class
Last day to withdraw
Classes End
Final Exams
Commencement Exercises

Summer Quarter 1978
Registration and Orientation
Classes meet as scheduled
Last day to register or add a class
Last day to drop a class
Last day to withdraw
Labor Day Holiday
Classes End
Final Exams

Fall Quarter 1978
Registration and Orientation
Classes meet as scheduled
Last day to register or add a class
Last day to drop a class
Last day to withdraw
Thanksgiving Holidays
Classes End
Final Exams
PURPOSE

The primary objective of the State Technical Institutes is to accept the broadest possible range of high school graduates and to produce the qualified aide to professional personnel in engineering, physical science, and computer science technologies, and the technician or technical worker in support of business and industry in the field of production, distribution, or service. The secondary objective shall be to cross-train or up-grade employed persons as para-professionals or technical workers for these same areas. The instructional emphasis shall be placed on the application of established scientific and/or engineering knowledge and competence in the use of technical skills which support professional activities.

Based on the above, the following specific objectives have been adopted for State Technical Institute at Knoxville:

1. To continue and improve existing two-year college-level technician-training programs.
2. To develop new two-year, college-level technician-training programs to meet the needs of individuals, businesses, industries, and governments of the East Tennessee region.
3. To continue and improve existing special courses and to develop additional courses to meet the special needs of employees and employers.
4. To provide counseling and guidance services to students, according to personal, occupational, and academic need.
Approved by the Tennessee State Board for Vocational Education, State Technical Institute at Knoxville is granted the privilege of awarding the Associate of Engineering and Associate of Science degrees.

State Technical Institute at Knoxville is a candidate for membership in the Southern Association of Colleges and Schools, 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.

Continuing to grow and be recognized as an important community resource, State Tech is an official member of the following organizations:
- American Association of Community and Junior Colleges
- Greater Knoxville Chamber of Commerce
- National Association of College and University Business Officers
- Society for the Advancement of Management
- Southern College Placement Association
The technician is a qualified specialist who applies scientific and/or engineering knowledge in business, industry, or government. The technician often has the responsibility of converting an idea or theory into a workable model. In other words, the technician fills the gap between the engineer and the craftsman, between the business manager and the computer, and must be able to understand and speak the language of both. Having the ability to combine theory and application, the technician serves a special and necessary function in our advancing technology.
BUSINESS DATA PROCESSING
(See p. 20)

CHEMICAL ENGINEERING TECHNOLOGY
(See p. 28)
Entrance Requirements

- A person applying for admission to the State Technical Institute at Knoxville (STIK) must be a high school graduate or have an equivalency (GED) diploma.
- It is recommended that individuals who have not previously earned satisfactory college-level credits submit scores from the American College Testing (ACT) examination.
- Each student must meet the standards of physical ability required by the occupational field which he plans to enter.
- The Institute will provide opportunities for education to all qualified applicants without regard to race, sex, creed, or status in life.

STUDENT CLASSIFICATION AND COURSE LOAD

Students carrying fewer than twelve quarter hours are considered part-time students.

Part-time students are required to fulfill all degree requirements and are subject to the same transfer of credit procedures as full-time students.

A student desiring to carry more than eighteen quarter hours must have the approval of his advisor and department head.

A student must have successfully completed forty-five credit hours to be considered a second-year student. Transfer credit plus State Tech work must total forty-five hours.
GENERAL INFORMATION
Admissions

FRESHMAN

Applications
Freshman applicants must submit a completed application and medical form. Forms are available in the Student Service Office. Applicants should submit a transcript of high school and college work, if any, or a copy of GED scores.

Registration and Orientation
All prospective students completing application procedures should register on the dates shown on the academic calendar and are required to attend an orientation period the week of registration.

TRANSFER STUDENTS

Applicants for transfer from another college or university must present a valid transcript from each school attended within the first quarter the student attends STIK.

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 11 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 per guidelines of the American Council on Education. The Institute will require verification from official military records.

SPECIAL STUDENTS

A special student is one who is not a candidate for a degree. Credit is granted but may not be used for degree purposes unless and until regular admission is granted.
GENERAL INFORMATION
Expenses
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 maintenance fee per quarter. Part-time students (registered for fewer than twelve hours) will pay $6.50 per quarter hour mainten ance fee not to exceed $65. (All fees must be paid at registration.) Financial aid arrangements must be made prior to registration. Students receiving any form of financial aid must have authorization on file in the Business Office before registration. A $5.00 fee will be charged for returned checks.

LATE FEES
A 10 per cent late fee will be charged for any registration occurring after the official registration date given in the academic calendar.

ADMINISTRATIVE DISMISSAL
A student may be Administratively Dismissed from STIK if he/she fails to satisfy the approved fees imposed by 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 prior to the due date.

All students Administratively Dismissed must secure the written approval of the President before readmission to STIK.

REFUND POLICY
State Tech will refund to any student who officially withdraws or is dismissed from a course, a portion of the maintenance fee. In order to obtain a refund, the student must present a written notice of withdrawal to the Admissions Office. The amount of refund is computed as follows:

If withdrawal occurs within 1 to 15 calendar days from the official registration date, the refund is 75 per cent.

If the withdrawal occurs within 16 to 30 calendar days from the official registration date, the refund is 50 per cent.

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

Refunds are made by the Business Office after the withdrawal. Any amount due to the Institute from the student must be paid before a refund is made to the student.
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 base 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 agency. While the student is in school, or at least a part-time student, 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. Recipients 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 are available which cover tuition only. 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 for 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. Students interested in financial aid should follow the procedures below:
1. File application for admission to State Tech.
2. File application for Basic Educational Opportunity Grant.
3. File a Family Financial Statement with American College Testing Program (ACT) Student Assistance Programs, 2201 North Dodge, P.O. Box 1000, Iowa City, Iowa 52240.

Contact the Financial Aid Counselor for further information.
GENERAL INFORMATION
Registration

STUDENT ADVISING
At the time of initial enrollment, each student will be assigned a faculty advisor by the Head of Student Services. 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 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.

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 during the week of the "last day to withdraw." Two evenings are provided to the evening students for this same purpose.

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

Students pay the maintenance fee and complete all registration requirements during pre-registration week.

Students who complete all requirements during pre-registration do not have to come to regular registration.

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</td>
<td>Student</td>
<td>1. Advisor</td>
</tr>
<tr>
<td></td>
<td>to add</td>
<td></td>
<td>2. Instructor</td>
</tr>
<tr>
<td>Add Class</td>
<td>After last day</td>
<td>Student</td>
<td>3. Registrar</td>
</tr>
<tr>
<td></td>
<td>to add</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drop Class</td>
<td>Through last day</td>
<td>Student</td>
<td>1. Advisor</td>
</tr>
<tr>
<td></td>
<td>to drop</td>
<td></td>
<td>2. Instructor</td>
</tr>
<tr>
<td>Drop Class</td>
<td>After last day</td>
<td>Student</td>
<td>3. Registrar</td>
</tr>
<tr>
<td></td>
<td>to drop</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Withdraw</td>
<td>Through last day</td>
<td>Student</td>
<td>1. Advisor</td>
</tr>
<tr>
<td></td>
<td>to withdraw</td>
<td></td>
<td>2. Instructor</td>
</tr>
<tr>
<td>Withdraw</td>
<td>After last day</td>
<td>Student</td>
<td>3. Registrar</td>
</tr>
<tr>
<td></td>
<td>to withdraw</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PROCEDURES FOR ADDING, DROPPING, AND WITHDRAWAL

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

After the "last day to add classes" has passed, any action to add classes becomes an exception and must have the approval of the Registrar. Except for correction of clerical errors or shift changes, the Registrar is not to accept any "adds" after the last day to add without the approval of the Acting Dean of Students.

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.

After the "last day to drop" has passed, any action (with the exception of shift changes or correction of clerical error) to drop classes becomes an exception and must be approved by the Registrar. Avoidance of failure whether due to academic reasons or excessive absences is not a valid reason for dropping a course after the last day to drop.

Withdrawal: Withdrawal is defined as dropping one or more classes after the "last day to drop." Withdrawal may be processed in accordance with the routing shown on the attached summary, up through the last day to withdraw, which is approximately two weeks before the end of the quarter.

The student's name remains on the roster, a permanent record of his enrollment is kept and, unless the instructor assigns some other grade, the student receives an automatic "WP" or "WF." Official withdrawal will be approved only for valid reasons and will not be approved to circumvent disciplinary actions or failing grades. The Registrar is not to accept any "withdrawals" after the "last day to withdraw" without the approval of the Acting Dean of Students.

General Note: Any student still on the roster but not attending class who did not officially drop or withdraw from a class is to receive a mark of "F" or "I."
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 90 credit hours to be eligible for the Associate Degree.
Minimum 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.
Approval of the faculty: Each candidate must be approved by the faculty prior to graduation.
Degree application: Each prospective candidate must file an "Intent to Graduate Form" at least one quarter prior to the quarter he/she expects to graduate. Forms may be obtained in the Admissions and Records Office.
Catalogue option: The student must meet the requirements of (a) the current catalogue or (b) the catalogue effective at the time he/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. Credit earned earlier than six years prior to graduation will be subject to review and evaluation by the Academic Council.
Commencement: All students are required to participate in a formal graduation ceremony.

ASSOCIATE OF SCIENCE DEGREE

ASSOCIATE OF ENGINEERING DEGREE
ACADEMIC STANDARDS

GRADING POLICY

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
C. Work habits and practices

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

<table>
<thead>
<tr>
<th>Grade</th>
<th>Quality Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4 per quarter hour</td>
</tr>
<tr>
<td>B</td>
<td>3 per quarter hour</td>
</tr>
<tr>
<td>C</td>
<td>2 per quarter hour</td>
</tr>
<tr>
<td>D</td>
<td>1 per quarter hour</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td>WP</td>
<td>0</td>
</tr>
<tr>
<td>WF</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>0</td>
</tr>
<tr>
<td>P</td>
<td>0</td>
</tr>
<tr>
<td>AU</td>
<td>0</td>
</tr>
<tr>
<td>X</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: The only school-wide grading policy is that no final exam will count more than 50% of a student’s final grade.

Policy on Incompletes:
An “I” becomes an “F” if work is not completed within 3 weeks after the first day of subsequent quarter.

Grade Point Average:
A cumulative Grade Point Average of at least 2.0 on all work taken at the Institute and applied toward a certificate or degree is required for graduation. Only those students who have completed all requirements for graduation are eligible to participate in the commencement service.
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:
Every student listed on the roster should receive a grade. If a name appears on the permanent roster, the student is still enrolled for the course even though he may not be attending class. If a name appears on the roster and the student has not been attending class, he should receive a grade.

Student Class Absences:
Students are expected to attend all classes each time the classes meet. When it becomes necessary that a student be absent from a class, courtesy requires an explanation to the instructor in charge.
Excessive absences may affect the student’s overall quarter grade at the discretion of the instructor. Excessive absences may also result in dismissal and failure at the discretion of the instructor.

ACADEMIC PROBATION AND SUSPENSION

Probation:
A student will be placed on probation at the end of any quarter in which he fails to maintain either 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 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 readmissions from Academic Suspension submitted to the President will be reviewed and acted upon by the Academic Standards Committee. This Committee will consist of the President, 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, courses taken are evaluated by the Admissions and Records Office and the respective divisions. 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. Any exception to this policy will be approved by the Academic Standards Committee. Credit is awarded in an amount up to the credit attached to the STIK course. No credit is awarded for transfer courses containing less than 75 percent of the credit hours associated with the STIK equivalent. Transferred credit will not be computed in a student's GPA of course work completed at STIK.

Transfer credit which can be applied to STIK courses may be accepted from institutions which are regionally accredited and also from institutions which have Engineering Council for Professional Development (ECPD) accredited programs. In the case of the latter, the only credit to be considered as transfer credit is to be from the ECPD accredited programs of the institutions in question. Transfer credit must have been completed in a six-year period prior to transfer. Any exceptions to this policy will be approved by the Academic Standards Committee.

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 STIK Admissions and Records Office. Transfer credit must be approved during a student's first quarter of attendance at STIK.

WAIVERS, INDEPENDENT STUDY
AND CREDIT BY EXAMINATION

Waivers:

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 in the prerequisite course and his progress in the course requiring the prerequisite would not be overly curtailed by not having had the prerequisite course.

The Waiver of a 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 it. 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.

Credit by Examination:
A student may challenge any course offered at STIK 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.

An examination fee will be assessed at $6.50 per credit hour for each course. This fee will be paid in addition to regular maintenance fees. The exam fee must be paid before the exam is taken.

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.
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 course department head. A fee of $6.50 per credit hour (non-refundable) must be paid to the Business Office for each course enrolled on an independent study basis regardless of whether he is otherwise a full-time or part-time student. 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 such that the course material is completed within the six-month time 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.
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 STIK. In its collection of books, periodicals, microfilm, audio-visual equipment and materials, the ERC supports the curriculum and provides recreational reading. Periodicals are an important part of the Library's collection as they 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 the instructional materials, the Media Center works hand-in-hand with institutional personnel by advising and consulting them in the various techniques and different means to present instructional materials. Audio-visual assistance is also available to students upon request.
STUDENT SERVICES AND ACTIVITIES

BOOKSTORE

Located in the student lounge, the bookstore offers a convenient array of supplies for every technology. Drafting instruments, calculators, specialty pens and pencils comprise only a small part of the stock items. Required textbooks and supplies for each class are available. For personal items or snacks, check the bookstore.

STUDENT SERVICES OFFICE

The Student Services Office coordinates the following services for students: testing and counseling, recruitment, student 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.
STUDENT SERVICES AND ACTIVITIES

Testing and Counseling:
Testing and counseling services are provided to assure that the student receives maximum results from his educational opportunities. The counselors are available for academic and personal counseling.

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, letters, posters, advertising by 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.

Student Financial Aid:
Numerous sources of Financial Aid are available through State Tech and other agencies for qualified students. (See p. 5 for further information.)

Job Placement and Follow-up:
Every effort is made to provide job placement information and aid to graduating students. Annual questionnaires are sent to graduates and their employers in order that the effectiveness of the school programs can be determined and adjusted to provide the maximum benefit to the future graduate and his employer.

Student Activities:
There are several activities on campus for students. The Student Government Association (SGA) sponsors several social events during the year, and is active in all of the school's activities. There is a student chapter of the American Society of Certified Engineering Technicians (ASCET) which sponsors field trips to local industries and gives students the opportunity to meet and talk with working technicians. There are also special interest clubs available to students, such as the Science Fiction Club and others. Any group wishing to organize a club is encouraged to do so.

VETERANS ADMINISTRATION
The Student Service Office coordinates course accreditation with the Veterans Administration Regional Office. Veterans are advised to see the VA Addendum to the STIK 1977-78 Catalog which is available in the Student Services Office.
Programs Of Instruction
BUSINESS DATA PROCESSING

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 and hence prepare them for a rewarding career 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 better understand the underlying problems of business data processing. These business courses together with foundation courses in English, mathematics and statistics will enable the student to effectively communicate 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 many diversified areas such as manufacturing enterprises, 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 it.

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.
# BUSINESS DATA PROCESSING
## Curriculum

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**Total Credits Required**

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*Team Taught by Data Processing and English Departments
**Team Taught by Data Processing and Math Departments
# Business Data Processing

## Associate of Science Degree

### Course Requirements

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## Elective

- Business Elective: 3

**TOTAL HOURS REQUIRED**

101
BUSINESS DATA PROCESSING
Course Descriptions

BU 201 Introduction to Business
A course which includes a survey of the role and function of business enterprise within our economic framework. It includes organization, finance, marketing, personnel administration, production and economics. 3 Credits

BU 221 Principles of Accounting I
A course which includes basic principles of accounting theory and practice, analysis and recording of business transactions, business documents and books and controlling accounts, adjusting and closing entries and payroll accounting. 3 Credits

BU 222 Principles of Accounting II
A course which includes merchandise inventory, deferrals and accruals, fixed assets, systems and controls and partnership and corporate accounting. Prerequisite: BU 221 3 Credits

BU 223 Principles of Accounting III
A course which includes cost accounting systems, budgetary control and standard costing, cost and revenue relationship for management, management reports and special analyses, funds statement and cash flow and financial statement analysis. Prerequisite: BU 222 3 Credits

EC 201 Principles of Economics
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. 3 Credits

DP 201 Introduction to Data Processing
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. 3 Credits

DP 202 Introduction to Programming
An introduction to basic computer language and flowcharting including the preparation and processing of individual programs. Operating procedures for computer systems are presented including concepts of operating systems and the functional role of the Central Processing Unit (CPU) and peripheral equipment. 4 Credits
MA 260 Computer Programming (BASIC)  4 Credits
3 Class Hours, 3 Laboratory Hours
A course which presents an introduction to computing by means of the BASIC
language. In addition to presenting the BASIC language and computer functions,
the course also covers the ancillary techniques of model building and a dis-
cussion of the solution framework of describing flowcharting and programming
a problem.
Prerequisite: DP 202

DP 211 Computer Programming (RPG)  4 Credits
3 Class Hours, 3 Laboratory Hours
The study and development of programming capabilities in the business com-
puter 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.
Prerequisite: DP 202

DP 221 Computer Programming (ASSEMBLER)  4 Credits
3 Class Hours, 3 Laboratory 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.
Prerequisite: DP 202

DP 222 Computer Programming Applications (ASSEMBLER)  4 Credits
3 Class Hours, 3 Laboratory Hours
A continuing study of ASSEMBLER language with emphasis placed upon ad-
vanced applications. Topics include subroutine linkage, file organization, and the
various file access methods.
Prerequisite: DP 221

DP 301 Computer Programming (COBOL)  4 Credits
3 Class Hours, 3 Laboratory Hours
Experience in using programming techniques with a high level language. Stu-
dents will be required to program, debug, and test specified business oriented
problems using COBOL.
Prerequisite: DP 202

DP 302 Computer Programming (Advanced COBOL)  4 Credits
3 Class Hours, 3 Laboratory Hours
A course which introduces advanced programming techniques using the COBOL
language. Students will be expected to use disk files and random access tech-
niques to solve programming problems.
Prerequisite: DP 301
BUSINESS DATA PROCESSING
Course Descriptions

DP 303  Computer Programming Applications (COBOL)  5 Credits
3 Class Hours, 6 Laboratory 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 302

DP 351  Operating Systems  4 Credits
3 Class Hours, 3 Laboratory Hours
A course designed to relate the individual features of operating systems such as job control, supervisors, monitors, libraries, utilities, generators, compilers and assemblers into a cohesive functional picture of the complete computer system. The student should then incorporate them into his programming and system design, utilizing the most efficient features of the entire computer system.
Prerequisite: DP 222

DP 355  Data Base Management  4 Credits
3 Class Hours, 3 Laboratory 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.
Prerequisite: DP 222

DP 360  Introduction to On-Line Systems  3 Credits
3 Class Hours
An introduction to the hardware and software systems which support today's on-line realtime business systems. Time sharing, multiprogramming systems and multiprocessing systems are all investigated as they relate to on-line systems.
Co-requisite: DP 351

DP 361  On-Line Programming Applications  5 Credits
3 Class Hours, 6 Laboratory Hours
A course in which students will be assigned projects which will be programmed in a simulated on-line, real-time environment. They will be expected to incorporate their previous experience with programming languages and programming aids in developing an efficient solution to the classroom problems.
Prerequisite: DP 360
BUSINESS DATA PROCESSING
Course Descriptions

DP 350  Systems Design and Development  3 Credits
3 Class Hours
A study of the overall computer based systems analysis and design process;
information problems of business organization and the inter-relationship of func-
tions; nature of business problem isolation and definition; initial phase of systems
analysis and evaluation.
Prerequisite: DP 202 & EN 314 & BU 223

EN 214  Data Processing Communications  3 Credits
3 Class Hours
A rigorous course which applies the student's communicative skills (both verbal
and written) in a simulated data processing environment. Students will be re-
quired to express themselves to both a business communications specialist
(non-EDP) and a data processing specialist.

MA 304  Applied Statistics  4 Credits
3 Class Hours, 3 Laboratory Hours
An applied course in which the students will be expected to use canned statistical
packages to solve statistical problems presented in class. They will be expected
to use their knowledge in the use of these packages to assist business managers
in critical decision making.
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 the following products: 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 controls 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**

**Chemical engineering technician**—works with chemical engineers, consulting firms, and individual plants during design of new chemical process equipment and improvement of existing systems.

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

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

**Chemical Instrument salesman**—sells and services instruments and assists in the development of new process control instrumentation.

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

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

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

## Curriculum

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

**POLYMER TECHNOLOGY**

- CH 322 Polymer Chemistry
- CET 351 Polymer Processing Principles I
- CET 352 Polymer Processing Principles II

**ENVIRONMENTAL TECHNOLOGY**

- CH 332 Environmental Chemistry
- CET 361 Environmental Control Principles I
- CET 362 Environmental Control Principles II

** Technical electives will be taken from a list of approved courses.
# CHEMICAL ENGINEERING TECHNOLOGY
Associate of Engineering Degree
Course Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hrs.</th>
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<td>EN 202</td>
<td>Basic Composition</td>
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<td>CET 311</td>
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<td>CET 321</td>
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<td>CET 331</td>
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<td><strong>TOTAL CREDIT HOURS REQUIRED</strong></td>
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</table>
CH 101 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 101 as a co-requisite)

CH 201 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 common practical applications of electrochemical reactions.
Prerequisite: MA 202

CH 211 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 201

CH 212 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 211
Co-requisite: MA 202
CH 221  Organic Chemistry  4 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 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 212

CH 311  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 212

CH 322  Polymer Chemistry  4 Credits
3 Class Hours, 3 Laboratory Hours
A survey course 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 221

CH 332  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 221 or consent of the instructor

CET 201  Industrial Seminar  1 Credit
1 Credit 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.
CET 231  Chemical Engineering Calculations I  4 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 by-pass and recycle operations. A calculations laboratory provides an opportunity for students to work problems under supervision.  Prerequisite: MA 201

CET 232  Chemical Engineering Calculations II  4 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.  Prerequisites: CET 231, MA 202

CET 301  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.

CET 311  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.

CET 321  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.

CET 331  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, measurement 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.  Prerequisite: CET 342  
Co-requisite: CET 343, 344
CET 341 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.  
Prerequisites: MA 203, CET 232

CET 342 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: CET 341

CET 343 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: CET 342

CET 344 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 on the preparation of detailed laboratory reports.  
Prerequisite: CET 342  
Co-requisite: CET 343

CET 351 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 322 or consent of the instructor
CHEMICAL ENGINEERING TECHNOLOGY
Course Descriptions

CET 352  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: CET 351 or consent of the instructor

CET 361  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 332

CET 362  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 covered will include biodegradable and non-biodegradable organic compounds; phosphates, nitrates and other nutrients; heavy metals; and dissolved salts. Prerequisite: CH 332

CET 371, 372, 373  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 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. As such, 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. Research and Development
2. Industrial Process Control
3. Numerical Control Systems
4. Space Research
5. National defense
6. Electronic Data Processing
7. Communications

TYPICAL POSITIONS OPEN TO ELECTRONIC ENGINEERING TECHNICIANS

Electronic technician — applies electronic circuits 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 and following blueprints, wiring diagrams, and manufacturing standards.
Systems quality control inspector — inspects electronic systems such as radar navigation, telemetering 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.

Systems testing laboratory technician — devises and modifies electronic instrumentation and apparatus used to test and evaluate electrical, electronic, electro-mechanical, and electrohydraulic 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.
# ELECTRONIC ENGINEERING TECHNOLOGY Curriculum

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<th>First Quarter</th>
<th>HOURS PER WEEK</th>
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<td><strong>EN 201</strong> Intro. to the Comm. Process</td>
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<td><strong>MA 201</strong> Algebra and Trigonometry I</td>
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<td><strong>PH 201</strong> Physics of Mechanics</td>
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<td><strong>ET 333</strong> Pulse and Digital Circuits II</td>
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<td><strong>EN 203</strong> Technical Report Prep. and Present.</td>
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TOTAL CREDIT HOURS: 108
# ELECTRONIC ENGINEERING TECHNOLOGY
## Associate of Engineering Degree
### Course Requirements

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<th>ENGLISH</th>
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<td>ET 342 Electro-Mechanical Systems</td>
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<td>ET 343 Transducers</td>
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<td>ET 344 Electrical Power Distribution Systems</td>
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<td>ET 351 Introduction to Communications</td>
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<td>ET 352 Communications Systems</td>
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<td>ET 204 DC and AC Circuits for Non-EET Majors</td>
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<td>ET 361 Special Projects</td>
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<th>ELECTIVES</th>
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<td>Electives may be selected from degree courses in Chemical, Mechanical and Electronic Engineering Technology, Mathematics and Physics</td>
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</table>
ET 201  Electric Circuits I  4 Credits
An introductory course in D.C. Electric Circuits. Topics treated include units and notation, atomic structure, current and voltage, resistance Ohm's, 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 courses as required.
Co-requisite: MA 201

ET 202  Electric Circuits II  4 Credits
An intermediate course in electric circuits in which subject matter pertaining to the transition from the study of D.C. to A.C. circuits is treated as well as all basic A.C. circuit behavior. Topics treated are capacitors, magnetic circuits, inductors, sinusoidal alternating current, phasors, series and parallel A.C. Circuits, series-parallel A.C. networks, analysis methods, network theorems (A.C.) and power (A.C.). The various types of electronic measuring instrumentation are introduced throughout the course as required.
Prerequisite: ET 201
Co-requisite: MA 202

ET 203  Electric Circuits III  4 Credits
A course in advanced A.C. Electric Circuits. Topics treated are resonance, poly-phase systems, non-sinusoidal circuits, transformers, and two port parameters. The various types of electronic measuring instrumentation are introduced throughout the course as required.
Prerequisite: ET 202
Co-requisite: MA 203

ET 204  DC and AC Circuits  4 Credits
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 Kirchhoff's Law and Power. Capacitors and inductors in DC circuits. The second portion of the course deals with AC Circuits using the methods learned in DC with phasor analysis.
Co-requisite: MA 202

ET 221  Active Devices I  4 Credits
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, small signal diode approximation, common base approximation, common emitter approximation, and common collector approximation.
Co-requisite: ET 202
ET 222  Active Devices II  4 Credits  
3 Class Hours, 3 Laboratory Hours  
An expanded study of solid state circuits and their design including large signal operation, biasing method, A-C operation, cascading of stages, temperature effects, frequency response and h-parameters.  
Prerequisite: ET 221  

ET 223  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 field-effect transistors, silicon controlled rectifiers, triacs, diacs, unijunction transistors, varistors, thermistors, varactors, light emitting diodes, opto-electronic devices and integrated circuits.  
Prerequisite: ET 222  

ET 331  Introduction to Digital Logic  4 Credits  
3 Class Hours, 3 Laboratory Hours  
A study of basic numbering systems, machine language programming, basic computer codes and Boolean Algebra. Appropriate symbols and diagrams of gating circuits are used to illustrate the use of Boolean Algebra and the simplification of logic circuits. Relay contacts, diode and transistor gates are used in the explanation of truth table.  
Prerequisite: ET 221  

ET 332  Pulse and Digital Circuits I  4 Credits  
3 Class Hours, 3 Laboratory Hours  
A study of wave-shaping, clipping and clamping circuits, inverter circuits, bistable, 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 221  
Co-requisite: ET 331  

ET 333  Pulse and Digital Circuits II  4 Credits  
3 Class Hours, 3 Laboratory Hours  
A study of digital logic circuits including gating, data transfer, registers, counters, D/A and A/D conversion, clock and control systems, computer memory devices, arithmetic devices and input/output equipment.  
Prerequisite: ET 332
ELECTRONIC ENGINEERING TECHNOLOGY
Course Descriptions

ET 341  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 synchronous machines
is given.
Prerequisite: ET 202

ET 342  Electrc-Mechanical Systems
4 Credits
3 Class Hours, 3 Laboratory Hours
A course utilizing concepts from electronic/industrial digital solid-state, and
transducers courses to deal with unified systems typical of industrial automation.
Prerequisite: ET 341

ET 343  Transducers
4 Credits
3 Class Hours, 3 Laboratory Hours
A study of transducer devices and their applications. Stress, strain, volume,
pressure, sound, temperature, and level are covered.
Prerequisite: ET 341

ET 344  Electrical Power Distribution Systems
4 Credits
3 Class Hours, 3 Laboratory Hours
A course designed primarily for the electronic major 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 203

ET 351  Introduction to Communications
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 223

ET 352  Communications Systems
4 Credits
3 Class Hours, 3 Laboratory Hours
A course which involves an expanded treatment of the basic circuits covered in
ET 351 and develops these concepts into communications systems, i.e., trans-
mitters, receivers, and antennas.
Prerequisite: ET 351

ET 361  Special Projects
2 Credits
0 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
ELECTRONIC ENGINEERING TECHNOLOGY
Course Descriptions

ELECTIVES:
ME 222 Industrial Safety
ET 351 Introduction to Communications
ET 352 Communication Systems
DP 222 Computer Programming
ET 344 Electrical Power Distribution Systems
MECHANICAL ENGINEERING TECHNOLOGY

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 automatic controls. 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 trouble shoots mechanical equipment; has the expertise to advise customers since he understands the equipment and can match it with the engineering requirements.

Research Assistant — 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 in trouble shooting and diagnosing problems with process equipment and systems.
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# MECHANICAL ENGINEERING TECHNOLOGY
## Associate of Engineering Degree
### Course Requirements

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<td>ME 221 Shop Practices</td>
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<td>ME 231 Statics</td>
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<td>ME 301 Strength of Materials</td>
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<td>ME 311 Machine Elements I</td>
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<td>ME 312 Machine Elements II</td>
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<td>ME 321 Fluid Mechanics</td>
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<td>ME 331 Heat Transfer</td>
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<td>1. No less than 3 hrs. selected from the Math, Physics, Electronics, Chemical and Mechanical courses.</td>
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<tr>
<td>2. No less than 4 hrs. selected from the Electronic Chemical, or Mechanical courses.</td>
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**TOTAL HOURS REQUIRED**: 104
DR 201  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 202  Technical Drawing  2 Credits  6 Laboratory Hours
Preparation of detail orthographic projections, sections and conventions, auxiliary drawing, isometric and oblique drawing. Common fasteners and simple assembly drawings are also covered in this course. Prerequisite: DR 201

DR 203  Detail Drawing Layout (Note 1)*  2 Credits  6 Laboratory Hours
An introduction to structural drawing and detailing, architectural drawing and detailing, axonometric projection, and perspective drawing. Major emphasis on individual student projects employing design, detail, and assembly drawing. Prerequisite: DR 202

DR 211  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.

ME 201  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.

ME 211  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 202

ME 221  Shop Practices  3 Credits  1 Class Hour, 6 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 various welding processes; inspection, measurement, and gauging during the forming process.
ME 222  Shop Practices  3 Credits
3 Class Hours, 3 Laboratory Hours
This course is an introduction into the use of machine tools. Content is the same as ME 221 with the exception that welding techniques have been replaced by copper-clad techniques. Limited to Electronic Engineering Technology majors only.

ME 223  Advanced Shop Practices (Note 1)*  3 Credits
1 Class Hour, 6 Laboratory Hours
This course builds on the experience of ME 221 or 222 covering more advanced shop fabrication techniques.
Prerequisite: ME 221 or ME 222

ME 202  Metallurgy (Note 1)*  4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the properties of metals. Crystal structure, equilibrium and phase diagrams, heat treatment are a few of the topics studied in relation to mechanical properties of metals.
Prerequisite: ME 201

ME 231  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.
Prerequisites: MA 201, PH 201
Co-requisite: MA 202

ME 232  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 231
Co-requisite: MA 203

ME 301  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 loads carrying configurations: such as beams, columns, compression, or tension structures.
Prerequisite: ME 231
ME 311 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 301, ME 232

ME 312 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 311

ME 321 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.
Prerequisites: ME 231, MA 203
Co-requisite: MA 303

ME 331 Heat Transfer 4 Credits
3 Class Hours, 3 Laboratory Hours
An introductory course in the fundamentals of applied heat transfer. Topics covered include the various modes of heat transfer—conduction, convection, and radiation. The principles of refrigeration, and of the heat engine also will be discussed.
Prerequisites: ME 321, ET 204

ME 332 Thermodynamics (Note 1)* 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, psychrometric chart, Mollier Diagram and thermodynamic applications.
Prerequisite: ME 331

ME 333 Heating and Air Conditioning Technology (Note 1)* 4 Credits
3 Class Hours, 3 Laboratory Hours
A course covering the calculation of heating and air conditioning loads, ventilation requirements, types of fans, unit sizing, dust collection and control.
Prerequisite: ME 332

52
ME 341 Automatic Controls
3 Credits
3 Class Hours, 0 Laboratory Hours
A course designed to introduce the concept of automatic (vs. manual) control. Topics covered include control systems and system components; open and closed loop design; block diagrams and mathematical models; system stability; Analog computer.
Prerequisite: MA 303

ME 351 Mechanical Vibrations (Note 1)*
3 Credits
3 Class Hours, 0 Laboratory Hours
A course covering the analysis of undamped and damped free vibrations; forced harmonic vibrations with and without damping; structural response; two dimension vibrations; and solution methods.
Prerequisites: MA 303, ME 232

ME 361 Production Planning (Note 1)*
3 Credits
3 Class Hours, 0 Laboratory Hours
This course covers the following areas: objectives and functions of production planning control in an industrial concern; types of industries, manufacturing and control; visual and mechanical control; inventory control; production planning control in an automated factory; production planning in a small company.
Prerequisite: Senior standing

Note 1*—Topics presented on demand basis.
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 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:

The 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:

The Physics courses are designed to offer students working knowledge of the basic principles of mechanics, electricity, and magnetism upon which all technological processes depend. An understanding of basic physical laws is essential to the technician’s maintaining 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.
EN 101  Reading and Study Improvement  3 Credits
3 Class Hours
A course in efficient reading with how-to-study suggestions. Equal attention is
given in improving reading rate, comprehension, and word power. The specialized
reading techniques of surveying, skimming, and scanning are employed and
emphasized throughout.

EN 102  Vocabulary Enrichment Module I  1 Credit
Self Study
A self-study course focusing on relatively common words likely to be encountered
in both technical and everyday reading, writing, and speaking situations. Special
emphasis is given to related word pairs that have similar spellings or meanings.

EN 103  Vocabulary Enrichment Module II  1 Credit
Self Study
A self-study course in word architecture. Prefixes, suffixes, and root word
elements likely to be encountered by the technician are included, with numerous
illustrations of each.

EN 104  Vocabulary Enrichment Module III  1 Credit
Self Study
A self-study course in word architecture designed to supplement EN 103. Additional
word elements are included.

EN 201  Speech: Introduction to the Communication Process  3 Credits
3 Class Hours
A course designed to develop listening and speaking skills, with initial emphasis
on interpersonal communications, group dynamics, and recognizing and re-
ponding to the uniqueness of each instance of communication; followed by
assigned formal speeches, videotaped to facilitate self-criticism.

EN 202  Basic Composition  3 Credits
3 Class Hours
A course focusing on the basic patterns of writing likely to be 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 203  Technical Report Preparation & Presentation  3 Credits
3 Class Hours
A course in organizing, preparing, and writing various types of technical papers
and reports, including memoranda, business letters, abstracts, oral reports, and a
formal technical report.

Prerequisites: EN 201, 202
EN 212 Business Communications I
3 Credits
3 Class Hours
A course designed to equip the student with skills necessary to communicate effectively in business situations. An intensive vocabulary building program is coupled with practice analyzing and writing short reports. Practice in problem solving through oral and written communication is emphasized throughout.
Prerequisite: EN 201

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.
Prerequisites: EN 201, 212
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 101</td>
<td>General Mathematics and Elementary Algebra</td>
<td>5</td>
<td>Class</td>
</tr>
<tr>
<td></td>
<td>A study of the fundamentals of arithmetic and</td>
<td></td>
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<tr>
<td></td>
<td>algebra. Topics studied include: fractions,</td>
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<td></td>
<td>decimals, percentage, operations with</td>
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<td></td>
<td>algebraic expressions, equations, factoring,</td>
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<td></td>
<td>graphs, and basic geometry.</td>
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<tr>
<td>MA 201</td>
<td>Algebra and Trigonometry I</td>
<td>4</td>
<td>Class</td>
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<tr>
<td></td>
<td>Introduction to trigonometry with topics from</td>
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<td></td>
<td>geometry. Additional topics include: exponents</td>
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<td></td>
<td>roots, radicals, linear and quadratic</td>
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<td></td>
<td>equations, simultaneous linear equations,</td>
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<td></td>
<td>functions, and graphs.</td>
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<tr>
<td>MA 202</td>
<td>Algebra and Trigonometry II</td>
<td>4</td>
<td>Class</td>
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<tr>
<td></td>
<td>Course topics include: additional work with</td>
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<tr>
<td></td>
<td>equations, logarithms, complex numbers,</td>
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<td></td>
<td>inequalities, variation, and further studies</td>
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<td></td>
<td>in trigonometry and plane analytic geometry.</td>
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<td></td>
<td>Prerequisite: MA 201</td>
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<tr>
<td>MA 203</td>
<td>Applied Calculus I</td>
<td>4</td>
<td>Class</td>
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<tr>
<td></td>
<td>Topics studied include: limits, the derivative</td>
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<td></td>
<td>continuity, maxima and minima, the indefinite</td>
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<td></td>
<td>integral, and the definite integral.</td>
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<td></td>
<td>Prerequisite: MA 202</td>
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<tr>
<td>MA 204</td>
<td>Probability and Statistics</td>
<td>3</td>
<td>Class</td>
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<tr>
<td></td>
<td>Descriptive statistics and statistical</td>
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<td></td>
<td>inference, random variables and probability,</td>
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<td></td>
<td>sampling, discrete and continuous models, and</td>
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<td>confidence intervals.</td>
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<td></td>
<td>Prerequisite: MA 202 or MA 243</td>
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<tr>
<td>MA 241</td>
<td>Mathematics for Data Processing I</td>
<td>3</td>
<td>Class</td>
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<tr>
<td></td>
<td>A study of the fundamentals of arithmetic and</td>
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<td></td>
<td>algebra including work with fractions,</td>
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<td>decimals, percentage, equations, and</td>
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<td></td>
<td>algebraic expressions.</td>
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<tr>
<td>MA 242</td>
<td>Mathematics for Data Processing II</td>
<td>3</td>
<td>Class</td>
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<tr>
<td></td>
<td>An introduction to computer arithmetic and</td>
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<td></td>
<td>notation. Special topics include mortgage and</td>
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<td>interest problems.</td>
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<td>Prerequisite: MA 241</td>
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<tr>
<td>MA 243</td>
<td>Mathematics for Data Processing III</td>
<td>3</td>
<td>Class</td>
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<tr>
<td></td>
<td>An introduction to descriptive statistics</td>
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<td></td>
<td>including sequences and series with</td>
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<td></td>
<td>applications, elementary probability theory,</td>
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<td></td>
<td>methods for solving linear equations, and</td>
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<td>applications of matrix algebra and game</td>
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<tr>
<td></td>
<td>theory.</td>
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<td></td>
<td>Prerequisite: MA 242</td>
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</tbody>
</table>
MA 260  Computer Programming (BASIC)  4 Credits
3 Class Hours, 3 Laboratory Hours
An introduction to computer programming using the computer language BASIC. Additional topics include computer functions, model building, and flowcharting.

MA 303  Applied Calculus II  4 Credits
4 Class Hours
Differentiation and integration of transcendental functions with applications, techniques of integration, power series, and differential equations.
Prerequisite: MA 203

MA 304  Applied Statistics  4 Credits
3 Class Hours, 3 Laboratory Hours
A course in the use of canned statistical packages for solving statistics problems by computer.

MA 312  Topics in Differential Calculus  3 Credits
3 Class Hours
An introduction to the applications of differential equations including both first and second order differential equations. Also partial derivatives and applications are studied.
Prerequisite: MA 303

SC 201  Human Relations in Industry  3 Credits
3 Class Hours
An experiential study of human interaction in the business and industrial complex. Emphasis is on the necessity of a cooperative environment to satisfy individual needs and to increase productivity.

SC 202  Consumer Economics  3 Credits
3 Class Hours
A course designed to acquaint the student with the fundamentals of investments, taxation, credit, insurance, business organizations, etc., and their effects upon the economic well-being of the individual consumer.
PH 101  Introduction to Physical Science  3 Credits
3 Class Hours, 0 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.

PH 201  Physics of Mechanics  4 Credits
3 Class Hours, 3 Laboratory Hours
The course covers the major topics of mechanics including vectors, Newton's Laws, work, energy, translational and rotational equilibrium, accelerated motion, impulse and momentum. The laboratory parallels class work and will be used to illustrate lecture principles.

Co-requisite: MA 201 or consent of the instructor

PH 202  Physics of Electricity and Magnetism  4 Credits
3 Class Hours, 3 Laboratory Hours
Basic laws and theories of electricity and magnetism are introduced. Electric and magnetic fields, electric potential, DC Circuits, electro-magnetic induction, and an introduction to AC Circuits are topics covered. Laboratory work closely parallels class work.

PH 203  Physics of Heat, Light, and Sound  4 Credits
3 Class Hours, 3 Laboratory Hours
The study of the fundamental laws of heat, light, and sound.

Prerequisite: PH 201
CONTINUING EDUCATION DIVISION
The Continuing Education Division serves as an extension of STIK 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.

PRESENT CERTIFICATE PROGRAMS
Certificate in Construction
The purpose of the Certificate Program in Construction at STIK is to present theory, practical application and related studies that will prepare graduates for direct entry into employment. Major emphasis of the Certificate Program will be to incorporate exercises and projects that resemble actual construction situations. First hand observation and the creative design of learning experiences will propel the student through various construction problems and processes, thus offering a complete scope of applicable knowledge. This learning process will constantly be involving the student with potential employers through the interchange of concepts, schematics, and documents related to the art of construction.

FUTURE CERTIFICATE PROGRAMS
1. Certificate in Chartered Property Casualty Underwriter (CPCU)
The purpose of the CPCU program is to develop and expand the number of professional property-liability insurance personnel. Requirements for the attainment of the CPCU designation establish professional standards for insurance personnel equivalent to the standards of those professions which have earned longstanding public recognition.

2. Certificate in Photography
This program will consist of a wide selection of courses in Photography and will encompass all aspects of Still Photography, Dark Room Techniques, Creative Techniques including commercial applications of photography.
3. Certificate in Radio and TV Production

Emphasis is on the programming end 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.

4. Certificate in Building Maintenance

This program is designed to give the student a general understanding of the materials, tools, principles and procedures used in maintaining residential and commercial property in a good state of repair.

The program will consist of twelve months of basic instruction in the electrical, carpentry, plumbing, heating, and air conditioning aspects of maintaining structures. The program will be designed to provide students with a theoretical and technical base in maintenance of residential and commercial structures.
# CONTINUING EDUCATION DIVISION
Certificate Program in Construction
Course Requirements

<table>
<thead>
<tr>
<th>MATHEMATICS</th>
<th>Class</th>
<th>Lab</th>
<th>Credit Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 101 General Math</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>MA 201 Alg. &amp; Trig I</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>MA 202 Alg. &amp; Trig II</td>
<td>4</td>
<td>0</td>
<td>4</td>
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<tr>
<td></td>
<td>13</td>
<td>0</td>
<td>13</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>MECHANICAL ENGINEERING TECHNOLOGY</th>
<th>Class</th>
<th>Lab</th>
<th>Credit Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR 201 Technical Drawing I</td>
<td>0</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>DR 202 Technical Drawing II</td>
<td>0</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>ME 211 Industrial Safety</td>
<td>3</td>
<td>0</td>
<td>3</td>
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<tr>
<td></td>
<td>3</td>
<td>12</td>
<td>7</td>
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<table>
<thead>
<tr>
<th>RELATED STUDIES</th>
<th>Class</th>
<th>Lab</th>
<th>Credit Hrs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC 201 Human Relations</td>
<td>3</td>
<td>0</td>
<td>3</td>
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<td></td>
<td>3</td>
<td>0</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>CONSTRUCTION COURSES</th>
<th>Class</th>
<th>Lab</th>
<th>Credit Hrs.</th>
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</thead>
<tbody>
<tr>
<td>AC 210 Project Control &amp; Constr. Mgmt</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>AC 211 Beginning Blup. Reading</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>AC 212 Principles of Light Constr</td>
<td>3</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>AC 214 Surveying &amp; Constr. Layout</td>
<td>3</td>
<td>3</td>
<td>4</td>
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<tr>
<td>AC 216 Constr. Materials</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>AC 233 Constr. Detailing</td>
<td>1</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>AC 236 Sanitary Systems</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>AC 244 Estimating</td>
<td>4</td>
<td>0</td>
<td>4</td>
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<tr>
<td>AC 247 Advanced Surveying</td>
<td>3</td>
<td>3</td>
<td>4</td>
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<td>26</td>
<td>22</td>
<td>33</td>
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</tbody>
</table>

Ten (10) Hours Credit Cooperative Work
Experience in a Related Field
Thirty Hours minimum per week

TOTAL HOURS REQUIRED

<table>
<thead>
<tr>
<th></th>
<th>Class</th>
<th>Lab</th>
<th>Credit Hrs.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>45</td>
<td>34</td>
<td>56</td>
</tr>
</tbody>
</table>
Project Control and Construction Management—AC 210
A course 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 to 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.

Beginning Blueprint Reading—AC 211
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. Course material will be construction drawings in structural steel, reinforced concrete, timber, and electrical and mechanical installation.

Advanced Blueprint Reading—AC 213
An advanced workshop course in reading blueprints. Using the basic print reading course as a foundation, this 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 in-depth 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 facts involved in reading prints.

Construction Materials—AC 216
Characteristics and methods of handling 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, laminates, cements, aggregates, concrete and mix design, mortar, steel, etc. Test procedures are emphasized.

Surveying and Construction Layout—AC 214
Basics of surveying practices and theory as directly related to construction layout. Emphasis is placed on practical aspects of location and layout of structures, driveways, and other typical job site surveying problems. Included also will be use and care of surveying instruments and necessary data and note keeping procedures.

Principles of Light Construction—AC 212
A comprehensive description of light frame construction. This course covers basic techniques and fundamentals essential in erecting a light frame building, including various phases of light construction in a logical sequence beginning with the building site, through each building systems, to the finished work.
### Construction Detailing—AC 233
Architectural detailing of concrete, steel and masonry structural members meeting specified safety requirements.

### Estimating—AC 244
A course in practical estimating procedures. The student is taught to develop the methods and procedures for preparing quantity surveys dealing with individual sections of work. Topics include calculation of masonry, concrete, steel, excavation, lumber, labor considerations, pricing, etc. Emphasis is placed on take-off procedures and the development of quantity survey sheets.

### Sanitary Systems—AC 236
A survey of basic hydraulics, the water requirements of a facility, water treatment and distribution, plumbing codes, plumbing systems, sewage systems, sewage treatments, storm runoff, and cleaning and disposal systems.

### Advanced Surveying II—AC 247
An advanced course which uses the survey and layout course as a foundation and 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 land surveying.

### Legal Problems in Construction—AC 215
An overview of legalities related to the construction business. This course is designed to give the student a rather broad knowledge of how decisions may affect and involve a construction company in legal situations.

### Income Tax Accounting—BU-111
A practical study of individual income tax procedures. This course is designed to enable individuals to prepare their own income tax returns. Subjects covered include taxable income, adjustments to income such as sick pay, moving expenses, employee expenses, itemized deductions, gains and losses from sale of property. Participants will gain practical knowledge in income tax preparation by preparing a number of sample income tax returns throughout the course.

### Management for First Line Supervisors—BU 116
Techniques for personnel supervision. This course is so constructed as to introduce, orient and develop 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 be motivated into concepts and new ideas of handling personnel.
<table>
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<tr>
<th>Course Description</th>
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<tbody>
<tr>
<td><strong>GED Preparation—CE 130</strong></td>
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<tr>
<td>Basic skills in reading, composition, and math. The General Educational Development Program is designed to assist persons who wish to take the GED test and achieve the equivalence of a high school diploma. The program will be a ten-week course of study.</td>
</tr>
<tr>
<td><strong>Still Photography I—AV 110</strong></td>
</tr>
<tr>
<td>Introduction to basic techniques of photography. Beginning class in the study and use of the adjustable camera, film, lighting, composition, black and white film processing, contact printing, and enlarging.</td>
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<tr>
<td><strong>Still Photography II—AV 111</strong></td>
</tr>
<tr>
<td>Advanced work in lighting, (outdoor, available light and studio) camera controls, and use of lenses. Special topics include slide copying, internegatives, and copying prints.</td>
</tr>
<tr>
<td><strong>Applied Mechanics I—ME 101</strong></td>
</tr>
<tr>
<td>A study of bodies at rest with their surroundings. This course will give the student an appreciation and understanding of how forces act on structures.</td>
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<tr>
<td><strong>Applied Mechanics II—ME 102</strong></td>
</tr>
<tr>
<td>A continuation of ME 101. This course uses the concepts of free-body diagrams and static equilibrium to analyze the forces on simple load-carrying structures by three analysis techniques: joints, sections, and frames. The laws of static friction and structural properties such as moment of inertia are also studied.</td>
</tr>
<tr>
<td><strong>Fluid Power I—ME 121</strong></td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td><strong>Fluid Power II—ME 122</strong></td>
</tr>
<tr>
<td>A continuation of ME 121. This course covers the technique 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.</td>
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</tbody>
</table>
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