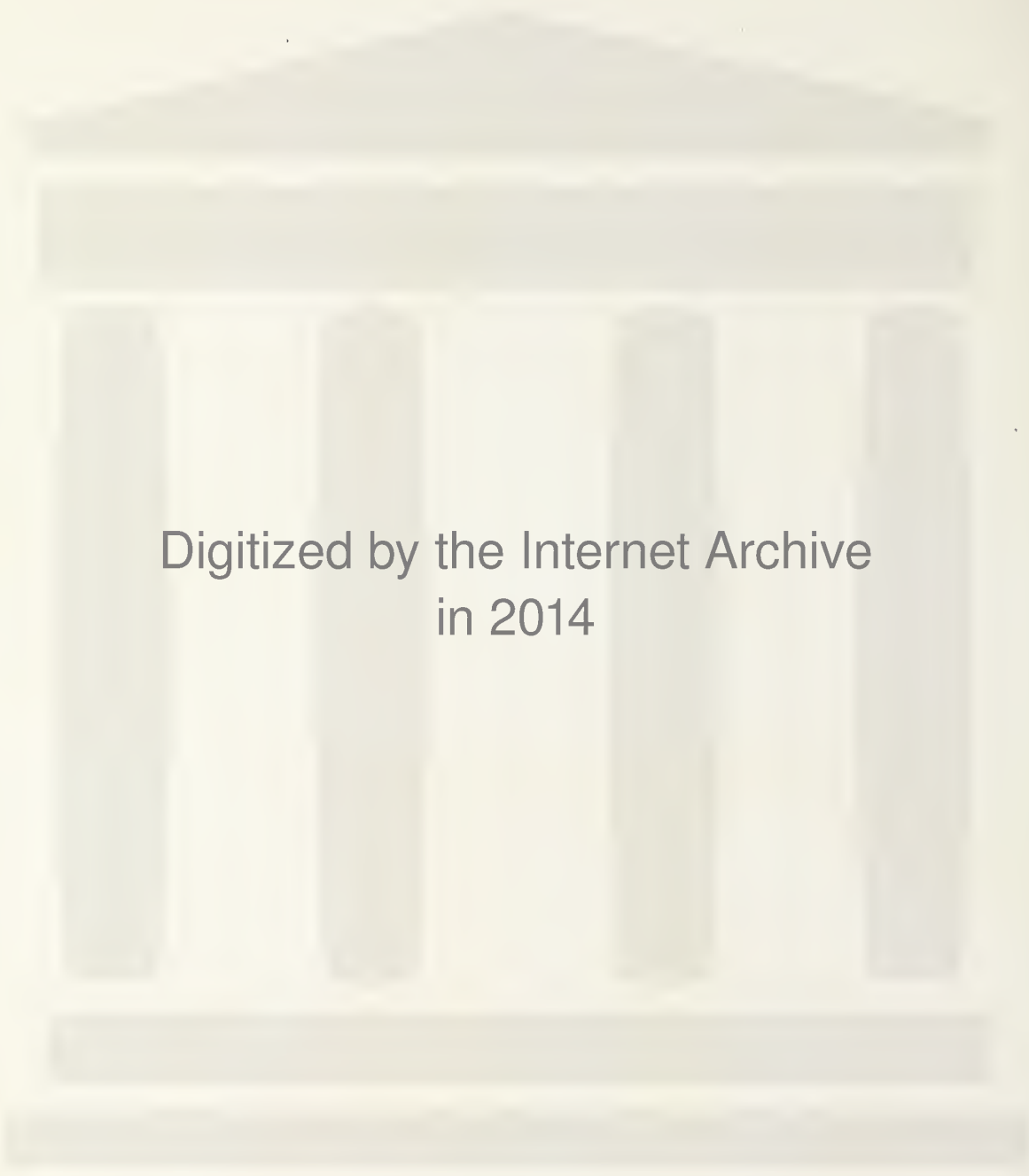


Kansas College of Technology Salina, Kansas

General Bulletin 1989-90





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WELCOME FROM THE PRESIDENT

Welcome to the Kansas College of Technology community. This is a community of outstanding faculty, staff and administrators committed to serving the needs of our students, industry and society in general.

The College is truly a unique institution, being the state college of technology under the control and supervision of the Kansas Board of Regents.

In addition to our regular Certificate, Associate of Technology and Associate of Applied Science degrees programs as outlined in this bulletin, Kansas College of Technology stands ready to serve the needs of the local citizenry as well as statewide business and industry. This service includes continuing education courses, workshops, seminars, custom designed short courses and consulting offered on-campus and on-site throughout the state.

As you review the bulletin, I am sure that you will realize the currency of our program offerings as well as the integration of computer applications into appropriate course work. We are very proud of our close relationship with industry to assist us in maintaining state-of-the-art programs. Of great importance to the employers of our graduates, all of our programs are designed using the criteria and guidelines developed by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology, recognized as the "Good Housekeeping Seal of Approval" for engineering technology programs.

As you review the bulletin, should you have any questions, please feel free to contact me or any of our dedicated personnel who are pleased to respond.



President Anthony L. Tilmans

TABLE OF CONTENTS

Section I: GENERAL INFORMATION

	Page
Welcome from the President	1
History and Development	3
Mission of the College	3
Objectives of the College Education	4
The Technical College Graduate	4
The College Technical Education	4
Academic Calendar for 1989-1990	4

Section 2: ADMISSIONS

General Information	5
How to Apply for Admissions	5
Admission as a Transfer Student	5
Admission as a Veteran	5
Admission as an International Student	6
Servicemens' Opportunity College	6
Out-of-state Application	6
Eligibility for Resident Fees	6
Admission Testing	6

Section 3: STUDENT SERVICES

Financial Aid	7
Scholarships	8
Veterans Affairs	8
Career Services	8
Student Housing	9
Food Service	10
Health Service	10
Student Union	10
Campus Bookstore	10
Student Life	10

Section 4: ACADEMIC INFORMATION

Academic Advising	11
Length of Academic Programs	11
Semester Credit Hours	11
Full-Time Status	11
Student Load	11
Freshman/Sophomore Standing	11
Scheduling of Classes	11
Pre-Enrollment	12
Auditing Courses	12
Class Attendance	12
Examinations	12
Grading System	12
President's Honor Roll	13
Dean's Honor Roll	13
Credit by Qualifying Examination	13
College Level Examination Program	13
Dropping or Withdrawal from Courses	13
Administrative Drop or Withdrawal	13
Academic Probation and Dismissal	14
Reinstatement	14
Repetition of Courses	14
Fees and Refunds	14

Fee Refund Schedule	14
Transcript	14
Directory Information	14
Application for Graduation	14
Graduation Requirements	15
Graduation with Honors	15
Library Services	15
Continuing Education	16
Campus Map	16-17

Section 5:

CURRICULA AND COURSE DESCRIPTIONS

Academic Departments	18
Accreditation and Certification	18
Program Options	18
Mathematics Transition Program	18
English and Reading Proficiency Programs	18
Key to Major Programs of Study	19
Aeronautics Division	20
Professional Pilot	20
Aviation Maintenance Airframe & Powerplant	21
Associate of Technology in Aviation Maintenance	22
Applied Science in Aviation Maintenance	21
Helicopter Maintenance Option	22
Aviation Maintenance Review Courses	23
Aeronautical Course Descriptions	23
Civil Engineering Technology	26
Construction Option	27
Surveying Technology	27
Civil Engineering Technology Course Descriptions	28
Computer Science Technology	30
Computer Information Systems	31
Computer Course Descriptions	32
Electronic Engineering Technology	35
Computer Engineering Technology	36
Electronic Course Descriptions	37
Industrial Engineering Technology	39
Chemical Engineering Technology	40
Industrial Technology Course Descriptions	39
Chemical Technology Course Descriptions	41
Mechanical Engineering Technology	42
Mechanical Course Descriptions	43
Automated Manufacturing Option	44
General Education Requirements	44
General Education Course Descriptions	44
Continuing Education Courses	48

Section 6: CONTROL OF THE COLLEGE

Board of Control	50
Board of Regents	50
Administration	50
Administrative Staff	50
Administration/Faculty	50

HISTORY AND DEVELOPMENT OF KANSAS TECH

Kansas College of Technology was created in 1965 by an act of the Kansas Legislature. The bill provided for the establishment of a state technical institute offering two-year programs of Science and Engineering Technology. Originally called Schilling Institute, the campus was developed on property that was formerly a part of Schilling Air Force Base. Enrollment of 93 students in four fields of study for the fall semester of 1966 was the start of an educational opportunity new to Kansas.

January 19, 1969, the Kansas Legislature dissolved the State Education Authority creating the State Board of Education and changing the College's name to Kansas Technical Institute.

In 1976, the Legislature transferred the responsibility for the College to the Kansas Board of Regents. Kansas Technical Institute became the seventh state institution under the control and supervision of the Kansas Board of Regents.

On April 12, 1988, Kansas Governor Mike Hayden signed into law a bill changing the College name to Kansas College of Technology.

Located on 149 acres, the college is adjacent to the Salina Municipal Airport in the Industrial Park area of southwestern Salina.

The College's active 17 buildings include an administration building, co-educational residence hall, cafeteria/conference center, gymnasium, classrooms, laboratories, and two aircraft hangars. The Technology Center, opened in 1985, has 30,000 square feet housing classrooms, laboratories, a library/resource center, computer center, faculty offices, and a lounge.

All programs of study are two-year Associate of Technology degree, Associate of Applied Science degree, or certificate programs. All programs have been designed to assure standards of excellence. The Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) accredits the Electronic Engineering Technology, Mechanical Engineering Technology, Civil Engineering Technology, and Computer Engineering Technology degree programs. The College is also accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools. The certificate program in Airframe and Powerplant Maintenance has been continuously certified by the Federal Aviation Agency since its start in 1966.

The reputation of the programs and the strong affiliation the College maintains with professional and technical associations has been a major factor in the success of and high regard held for Kansas College of Technology graduates.

MISSION OF THE COLLEGE

"Kansas College of Technology shall provide education of technicians and technologists in the fields of engineering technology, information technology and science technology. The College may also provide education or training in related technical and occupational fields. Educational programs shall include degree curricula and certificate programs as approved by the Board of Regents, and special institutes, seminars, short courses and workshops at appropriate locations in Kansas."

Kansas College of Technology has identified major areas of responsibility necessary to the fulfillment of its mission. These responsibilities are primarily concerned with the intellectual and personal development of the student. The College shall provide:

1. instruction in theory, skills, and applications within the student's chosen technology.
2. general education in mathematics, science, communications, business, and related subjects to enhance the student's overall professional value.
3. opportunities for continuing education to those adults who desire to develop, or reinforce, technical and personal competencies through appropriate seminars, workshops, short courses or conferences.
4. an atmosphere that encourages students to develop intellectual discipline, integrity, and positive attitudes toward work and self-improvement.
5. encouragement and support for faculty members to improve their professional and academic abilities.
6. regular opportunities for communication and cooperation with industry, for the primary purpose of assessing current industry needs and maintaining educational programs appropriate to those needs.
7. resources, equipment and facilities to support, supplement and promote excellence in instruction.
8. academic and student support services: advising, enrollment, records, financial aid assistance, resident housing, transfer credit assistance, counseling and referral, supplemental training in basic skills, and placement assistance.
9. opportunities and encouragement for student involvement in activities, associations, and student government.
10. information that promotes the college's activities and programs to constituents, including friends, alumni, prospective students, families of students, industry, the local community and the general populace of Kansas.
11. procedures for accountability and continued accreditation.

OBJECTIVES OF KANSAS COLLEGE OF TECHNOLOGY EDUCATION

The Kansas College of Technology technical education has been designed and planned to meet the following objectives:

To provide students with a MARKETABLE knowledge. The skills and knowledge required by a given technology are identified by working with employers in the community and state. Programs are intended to be broad enough to encompass skills and knowledge needed in technical occupations of the future.

To develop in the student certain social competencies which may make employment possible, permanent, and profitable.

It is also recognized that the college must assume a responsibility to help meet the technology manpower needs of the state's business and industry, contributing to the welfare of Kansas.

THE TECHNICAL COLLEGE GRADUATE

Technical College graduates are individuals who help turn ideas and theories into actual results. They work with engineers and scientists, business and government, and industry to provide important services, skills, and products necessary in today's society.

THE COLLEGE TECHNICAL EDUCATION

An important aspect of technical education lies in the ability of an institution to tailor the curricula to meet the specific needs of the community it serves. Kansas College of Technology serves the entire state of Kansas. The college develops educational programs, methods, and resources for students, business, and industry statewide.

At Kansas College of Technology, Industry/Community Advisory Committees composed of representatives of the area's business, industry, and community agencies meet frequently with the administrative and instructional personnel. They review and suggest revisions in the content of the regular technical programs, guide and assist in the development of new programs and courses, and aid in the placement of graduates. Kansas College of Technology is committed to developing a dynamic relationship between the College and the business and industrial firms in Kansas that ultimately hire graduates.

KANSAS COLLEGE OF TECHNOLOGY ACADEMIC CALENDAR FOR 1989-1990

Fall Semester

Orientation	TH	Aug. 24
Registration	F	Aug. 25
Classes begin	M	Aug. 28
Labor Day (no classes)	M	Sept. 4
Last day to register or add courses	M	Sept. 11
Last day for credit by examination	M	Sept. 11
Last day to drop courses with no record	F	Oct. 20
Faculty workshop (no classes 1-5 p.m.)	F	Oct. 27
Pre-enrollment	M-F	Nov. 13-17
Thanksgiving vacation	W-F	Nov. 22-24
Last day to withdraw from courses	M	Nov. 27
Final exams	M-F	Dec. 18-21
Grades due (noon)	F	Dec. 22

Spring Semester

Registration	TU	Jan. 16
Classes begin	W	Jan. 17
Last day to register or add courses	W	Jan. 31
Last day for credit by examination	W	Jan. 31
Faculty workshop (no classes 1-5 p.m.)	F	Mar. 2
Last day to drop classes with no record	F	Mar. 9
Spring break (no classes)	M-F	Mar. 12-16
Easter break (no classes)	M	Apr. 16
Pre-enrollment	T-F	Apr. 17-20
Last day to withdraw from courses	F	Apr. 20
Final exam period	M-TH	May 14-17
Grades due, graduates	TH	May 17
Commencement	SAT	May 19
Grades due, non-graduates (9 a.m.)	M	May 21

Summer Session

Registration and start of classes	M	June 4
Last day to register or add courses	F	June 8
Last day to drop courses with no record	F	June 29
Fourth of July holiday (no classes)	M-T	July 4
Last day to withdraw from courses	M	July 16
Final exams during last regular class day		
Summer semester ends	F	July 27

ADMISSIONS

General Information

The College has an 'Open Door' policy that admits all applicants whose qualifications indicate they may benefit from the instructional programs offered. Additionally, Kansas residents who have been graduated from an accredited Kansas high school and who have not previously attended another college are automatically admitted to the College. The College is committed to the concept of equal opportunity in its activities and prohibits discrimination in admissions on the basis of age, race, sex, color, religious affiliation, disability, ancestry, national origin, sexual preference, and veteran status.

Any person who has graduated from an accredited high school, or has completed the G.E.D. and meets criteria acceptable to the State of Kansas, may apply for admission. No academically qualified applicant is denied admission. If you are a high school student preparing for college, you are encouraged to take the Kansas Board of Regents recommended curriculum for college preparation including:

English—4 years

Math—3 years, including algebra II, trigonometry, and pre-calculus

Science—3 years, including chemistry and physics

Social Studies—3 years

In addition, the College also recommends the following courses in high school:

Speech

Computer Literacy or Introduction to Computers

Once an applicant has been accepted, he or she may participate in early enrollment. During this process, the student receives personalized academic advising from a faculty member for preparing the student's educational plan and selecting the first semester's courses.

How to Apply for Admission

1. Complete and return the Application for Admission.

Forms may be obtained from the:

Office of Admissions

Kansas College of Technology

2409 Scanlan Avenue

Salina, KS 67401-8196

2. Request that an official, final high school transcript, or official scores of G.E.D., be sent to the Admissions Office. The applicant is responsible for assuring that this information is sent and received.

3. Request that official A.C.T. scores be sent to the Admissions Office, if you are a freshman applicant directly out of high school or a transfer applicant with fewer than 15 college credit hours. If you have not taken the A.C.T., you may make plans to take it through the College prior to or immediately after registration for classes. High school counselors can also provide information about test dates and locations.

Applicants who have not pursued their education beyond high school for a period of time and transfer applicants with more than 15 college credit hours should contact the Admissions Office about the College's assessment program in lieu of the A.C.T.

4. Transfer applicants request that official transcripts from all colleges attended be sent to the Admissions Office. The applicant is responsible for assuring that this information is sent and received.

Applicants are advised that if any of the preceding items are not on file their transcript records may be withheld until the file is complete.

Admission as a Transfer Student

Transfer applicants from other accredited colleges or universities are eligible for admission providing they meet the College's admission requirements. Students wishing to transfer should follow the procedures outlined above. All course credits earned from another college or university and shown on the applicant's transcript(s) will be evaluated to assure that they are equivalent to the College's courses in the chosen field of study. All courses that are equivalent become part of the student's official transcript when they matriculate. Only those courses where the student received a "C" average or better, and which apply to the selected course of study, will transfer to the student's official College transcript to be counted toward graduation credit.

Admission as a Veteran

The Veteran's Administration recognizes Kansas College of Technology as qualified to provide college-level education under all laws providing veterans' benefits. Veterans accepted for admission at the College are subject to the same regulations and policies as non-veteran students. Veterans should apply for admission and arrange a conference with the veteran's advisor well in advance of the semester in which they wish to enter the College. Credits from special military schools and courses completed through study at the Armed Forces Institute and/or a transcript of in-service training may be accepted for transfer to the College. Soldiers registered with the Army/American Council on Education Transcript Registry System (AARTS) should have that transcript sent to the Admissions Office for evaluation. To apply for admission, follow the admissions procedures described above and submit a copy of form DD-214 and VA application form 22-1990 (available from the Admissions Office).

Veterans must meet the same standard of satisfactory academic progress as all other financial aid recipients at the College. If satisfactory academic progress is not maintained, the veteran will not be eligible for aid until his/her academic standing meets the College's requirements.

Admission as an International Student

Applicants from a country other than the United States will be considered international student applicants. Please contact the Director of Admissions for a packet of specific information about the application process, qualifications for acceptance, costs of attendance, and registration and enrollment procedures. Correspondence with the Director should begin no later than six (6) months prior to the desired enrollment date. International student applicants accepted for admission will be considered as out-of-state students for the purpose of tuition and fee payments. Each foreign applicant is required to document that adequate funds are on deposit to meet the cost of education at the College. (The College *cannot* provide financial aid to international students.) Applicants for which English is not a native language must submit scores on the Test of English as a Foreign Language (TOEFL). An applicant must have scored 550 or above on this test to be admitted.

Servicemen's Opportunity College (SOC)

The Kansas College of Technology is a participating member of the network of the Servicemen's Opportunity College which seeks to make post-secondary education available to persons in the military in ways consistent with an individual's service assignment. For more information contact the Admissions Office.

Out-of-State Applicants

Out-of-State applicants for admission to Kansas College of Technology should follow the application procedures stated previously. They may be required to pay non-resident fees. Generally, applicants should have at least a "C" average in all courses taken, and have an academic rank in the upper 50% of their graduating class. The G.E.D. is acceptable, subject to the State of Kansas criteria.

Eligibility for Resident Fees

The classification of students eligibility of resident and non-resident status for fee purposes is made by the Registrar's Office. Residence of the student is usually determined with regard to the 12 month period prior to enrollment and in accordance with the law and regulations of the State of Kansas. Information provided by the student on the application form and registration forms will be used to declare residency status. Students who wish to appeal their classification may do so by completing a standard appeals form provided by the Registrar's Office within 30 days of the classification or reclassification. More complete information on the residence law and regulations can be requested from:

Registrar's Office
Kansas College of Technology
2409 Scanlan Avenue
Salina, Kansas 87401-8196

Admission Testing

The College requires an assessment of all applicants. The College uses the results of these assessments in academic advising, development of the student's educational plan and proper placement in courses.

The College prefers that students desiring enrollment directly from high school take the A.C.T. while still in school. These students should contact their high school counselor to take the test during their junior or senior year. Their official scores should be sent to the College's Admissions Office for inclusion in their admissions file. The College's A.C.T. code is 1453. High school applicants who have not taken the A.C.T. may take it at the College at the beginning of each semester. Information about the time and place of the test will be included in each new student's orientation materials.

Transfer students who have previously taken the A.C.T. and who have accumulated fewer than 15 college credit hours should also submit official A.C.T. scores. A form used to request the scores is available from the Admissions Office.

Applicants who have not pursued their education past high school for a period of time and transfer applicants with more than 15 college credit hours should contact the Admissions Office about the College's assessment program. These assessments may be given during the pre-enrollment process or during formal registration prior to the beginning of each semester.



STUDENT SERVICES

Kansas College of Technology provides a wide range of services designed to facilitate and enhance the student's learning experience. The people who support the efforts of the institution expect its graduates to be able to participate in and contribute to the welfare of our society as well as possess the necessary skills to enter a career field. The College takes this obligation to parents and taxpayers seriously.

Students are encouraged to take advantage of the services offered to enhance their personal development and enjoyment of their time spent at Kansas College of Technology.

FINANCIAL AID

Financial aid at Kansas College of Technology is designed to bridge the gap between the costs of attending the college and what the student and his/her family are expected to pay. A varied and comprehensive aid program is available to all students at the college. In general, qualifications require acceptable scholastic standing and demonstrated financial need.

Students desiring to apply for financial aid should complete the application for admission and then contact the Office of Financial Aid. Information as to how to do this will be provided by the Admissions Office in the pre-application packet the student receives. The procedure to apply for financial aid is as follows:

1. Submit an application for admissions to the college.
2. Request a financial aid packet from the Office of Financial Aid. This packet contains the detailed instructions for completing the application process.

To receive priority consideration students should submit their applications by March 15 for the fall and spring semester. Although requests for aid are considered on an on-going basis applications received after that date are considered only if funds are available.

The Office of Financial Aid is available to offer help and guidance at any time a student may have a need. Among the types of financial assistance available are the following:

PELL Grant, funded by the Federal Government, are available to any individual enrolled at least half-time and degree seeking at the college and demonstrating financial need. Depending upon need and enrollment status the grant may provide up to \$2,300 a year for tuition, fees, books, and other education related expenses.

The **College Work Study Program** is a federally funded program in which students may work part-time on campus. A list of available part-time positions is maintained in the Financial Aid Office.

The **Supplemental Educational Opportunity Grant** is a federal program for students with exceptional need. The amount awarded will vary from \$100-\$4,000 a year depending on federal funding. Priority is given to those with exceptional financial need and are eligible for a PELL Grant.

The **Stafford Loan (GSL)** is a low-interest (8%) loan program available through a bank, credit union, or other commercial lending institution. Eligibility is determined by the Financial Aid Office. The maximum that may be borrowed is \$2,625 per year with a maximum of \$17,250 for under-graduate studies. Repayment of \$50.00 per month per loan begins six months after the student leaves school or enrollment status drops below half-time. Contact the Financial Aid Office for details.

Plus Loan is a federal loan program that allows parents to borrow up to \$4,000 a year, or a total of \$20,000 for the undergraduate education of the dependent student. Repayment begins 60 days after issuance of the loan. Financial need is not a requirement for this program. The interest rate cannot exceed 12%.

Supplemental Loan for Students (SLS) is a federal loan that an independent student may borrow on their own behalf. A student may borrow up to \$4,000.00 per year, \$20,000 total for undergraduate and graduate work. The money is borrowed through the student's lender. The current interest rate is 12% with payment beginning within 60 days after disbursement of the check, unless the borrower qualifies for a deferment as a full-time student. Financial need is not a requirement of this program.

State of Kansas Scholarships of \$1,000 a year are offered through the Kansas Board of Regents. Recipients are determined by ACT scores, high school achievement level of 3.3 and financial need. Students apply through the ACT-FFS.

Kansas Vocational Scholarships are available to students through the Kansas Board of Regents who enroll in technical programs. The scholarship offers up to \$500 and is not based on need. Applications are available at the Financial Aid Office.

Kansas Career Work Study is offered through the Kansas Board of Regents to offer off-campus employment opportunities to students in their program of study on a part-time basis. The student must be enrolled on at least a half-time basis and be a resident of the State of Kansas. This program is not based on financial need. The employer and Kansas College of Technology equally share the cost of the program.

Kansas College of Technology Scholarship opportunities are available ranging from \$100 to \$1,300. Students should realize some scholarships are awarded to only one individual during a year, consequently, funds are limited. Students should contact the Financial Aid Office for details on scholarships available.

G.P.A.

Required	Scholarship	Amount
3.50-4.00	Presidential Award	\$1,250
3.00-3.50	Dean's Award	\$1,000
2.75-3.25	Merit Award	\$ 500

The following factors are considered by the Scholarship Committee in the awarding of a scholarship: high school and/or college grade point average (GPA), financial need, remaining unmet need, enrollment status as a full-time student, and pursuing a program of study at Kansas College of Technology. Any guidelines that the scholarship donor wishes will also be considered. Applications for the full academic year must be received by the Financial Aid Office by March 15. Students interested in applying for scholarships for the Spring semester must do so by November 15. Scholarship applications may be obtained through the Financial Aid Office.

The following factors are considered by the Scholarship Committee in the awarding of a scholarship: high school and/or college grade point average (GPA), financial need, remaining unmet need, enrollment status as a full-time student, and pursuing a program of study at Kansas College of Technology. Any guidelines that the scholarship donor wishes will also be considered. Applications for the full academic year must be received by the Financial Aid Office by March 15. Students interested in applying for scholarships for the Spring semester must do so by November 15. Scholarship applications may be obtained through the Financial Aid Office.

Kansas College of Technology Sponsorships. Sponsorships are based on the same requirements and application procedures as scholarships. One-half of the sponsorship is repaid to The College 6 months after graduation or withdrawal from college. This policy allows for a greater number of recipients and additional funds are also made available to other students through repayment.

On Campus Part-Time Employment. Any student, regardless of personal or family financial income, who wishes to defray their college expenses by working part-time on campus may do so if there are such job vacancies available. A list of part-time jobs is maintained by the financial aid office. Currently, the minimum wage for such jobs is \$4.00 an hour.

VETERANS AFFAIRS

Veterans assistance is arranged through the Student Services Office. Any questions should be channeled through that office. This includes questions on entitlement, counseling, and the numerous other areas which are specific to the veterans needs.

CAREER SERVICES

The Career Development and Placement Center is centrally located on campus in the Tullis Building.

Services include employment vacancy referrals, resume preparation, interview workshops, career counseling, video self-evaluation, and employer workshops.

Career development is conducted through the use of a computerized system of guidance and information that helps students gather occupational and professional goals.

The Career Development and Placement Center maintains close contact with numerous industries and business firms interested in graduates of technical colleges as prospective employees. Students taking advantage of the Placement Center are given the opportunity to discuss their employment goals with representatives of firms during the final year of their educational programs.

These discussions may take place on campus, or if feasible, the student is provided the opportunity to visit the site of the firm in order to obtain a clear picture of the manufacturing operations.

Files of information for resource materials are maintained to use in the job pursuit process. References are available on industries and businesses in many cities in the United States, and some international locations.

The College assists students in finding part-time employment, as well as graduates in finding full-time employment.

Degree candidates, as well as those earning two-year certificates, are encouraged to visit with Career Services Director early in their academic program in order that their field of interest can be explored.



Students in curricula not regularly sought for on-campus interviews have access to equally valuable career assistance to develop job search strategies. The Career Library reflects current employment trends and opportunities in business, industry, education, and government. A comprehensive collection of materials is maintained to assist students in assessing occupations, professions, and continuing education.

Follow-up studies and surveys are conducted with graduates and alumni to determine the effectiveness of career development, training, and placement.

STUDENT HOUSING

Living on campus is an aspect of college life that many students enjoy. Moving into a new situation with people from different backgrounds helps our students grow in their development of interpersonal relationships. Life in the Residence Hall offers our students the opportunity to develop life-long friendships while furthering their academic career.

For these reasons, all single freshman students who live beyond commuting distance will be required to live in the Residence Hall for two (2) semesters, summer school is not included as an academic semester. The residence hall sponsors a variety of programs throughout the academic year. Activities are provided both by the residence hall staff and by the residents. Students who meet the following conditions are permitted to live off-campus:

1. A student who has attended another institution of higher education for two (2) semesters.
2. A student who is a veteran.
3. A student who is twenty-one years of age or older.

Special cases include the following:

Students living with relatives who live within commuting distance of Salina. This will require a signed, notarized statement from the student's parent. This form must be obtained from the Director of Student Life.

All exceptions in this category require approval by the Director of Student Life.

Residence Hall rooms are reserved by paying an application fee of \$25.00 annually, which is non-refundable. Reservations, including the deposit, should be made by submitting the contract as early as possible to insure availability of housing. The contract will be processed when received, and room assignments made from the information given.

The residence hall contract is an annual commitment, which includes food services. **Any student planning to cancel this contract should first read their contract.**

When a student moves into the residence hall, a damage deposit of \$50.00 is required. This deposit will be refunded when the resident moves from the hall, if the room is left in accordance to check out procedures with no damages and the student has paid all judicial fines.

Our facilities are designed to accommodate two (2) students per room. All rooms are equipped with single beds, adequate storage, dresser, desk, and chair. Bedding, pillows and other incidental room furnishings must be supplied by occupants.

Students who are not required to live in campus housing and who wish to seek residence in the local community can coordinate their search for housing through the Student Services Office. That office will post any vacancies known within the community.



FOOD SERVICE

The campus Cafeteria/Conference Center is located adjacent to the residence hall. The preparation of the food is under the supervision of a professional food service manager to insure balanced and wholesome meals. Students may have unlimited seconds on all items except for steak. Our food service takes special care in offering variety to our students. In addition, should you have a specific dietary stipulation, our manager will help accommodate your specialized needs.

Students not living in the Residence Hall may purchase meals either a la carte, or by arranged meal plan which is coordinated through the food service manager.

CAMPUS BOOKSTORE

The campus bookstore is located in the Student Union building. A complete inventory of textbooks and supplies is maintained. Other items include gifts, greeting cards, reference books, calculators, backpacks, and imprinted clothing.

STUDENT UNION

The Student Union provides recreational activities, a snack bar, meeting rooms for campus organizations, and a quiet room for study.

The Union is supported financially by the fees paid by all students during each enrollment period.

HEALTH SERVICE

Injuries or illnesses which require the attention of a physician are referred to Salina clinics which perform any medical service required by a student at the college. The cost of this service will be assumed by the student.

A special student health and accident program is available to all students under 26 years of age enrolling at Kansas Tech. This program is optional but deserves serious consideration from students who are not covered under some form of medical insurance. For more information on the health program, contact the Student Services Office.

COUNSELING SERVICES

Personal counseling services are available through the Student Services office located in the Administration building. The primary function of the program is to promote personal growth and development and to assist students in achieving a greater degree of fulfillment in their lives.

In an effort to more completely meet the needs of students and expand the total educational experience the following services are offered: (1) individual counseling in such areas as social and emotional adjustment, career selection, life planning; (2) testing and test interpretation in interests and personality traits; (3) and life style development.

STUDENT LIFE

A wide range of activities is provided for the enjoyment and development of the student. Students may find opportunities with a group or club which will appeal to their special interests.

Clubs and other student organizations occur as student interest may warrant. Currently, the following are active on campus.

Bowling Club. This club forms the bowling league for students each year. League competition is once a week at one of the Salina bowling establishments. Student members who represent Kansas College of Technology at American College Union Association regional and national tournaments usually are selected from this league.

Concrete Canoe Club. This group is composed of students interested in helping to design and make the college's entry in the annual concrete canoe race held at Manhattan each year.

Ham Radio Club. Club activities are designed for students interested in participation and learning more about ham radio organizations and activities.

Non-Traditional Students' Organization. Composed of students who do not fit into the more typical younger student interest areas who meet weekly to discuss common problems faced by older students.

Radio Control Club. Model airplane enthusiasts are encouraged to join this organization to learn more about radio-controlled model airplane activities.

Student Government Association. Students are urged to take an active role in the Student Governing Association (SGA). The SGA participates in the development of basic codes of conduct, disciplinary measures, campus activities, and other facets of administrative organization and control.

Various events will be scheduled throughout the year for the social development and enjoyment of students. In most cases, the planning and organization of social activities will be the responsibility of the SGA.

Tau Omicron Tau (TOT). Students who have attained 12 credit hours or more with a cumulative quality point average (QPA) of 3.25 or above are eligible for membership in Tau Omicron Tau (TOT) honor society. The purpose of the organization is to recognize students with high academic achievement and to promote student involvement in campus activities.

Vocational/Industrial Clubs of America (VICA). Individuals majoring in the area of Airframe and Powerplant are encouraged to become active in this organization. The organization supports students who represent the college at regional and national competitions in their academic area of interest.

Quiz Bowl. Once each year, departments select students to participate in an annual trivia bowl contest. The winning department team goes on to represent the college against other area college trivia teams.

Campus activities have also included: photography club, student yearbook, student newspaper, student ambassadors, golf, and basketball.

Any student(s) having an interest in forming a club on campus is encouraged to contact the Director of Student Life.



ACADEMIC ADVISING

An important factor in the success of a student is the quality of relationship between student and advisor. The advising process is an integral part of the education experience at the College and includes: career planning; college adjustment guidance; individual counseling; referrals; and selection of courses in developing a program of study consistent with the student's goals, interests, and abilities.

Students majoring in a program of study will be assigned an academic advisor to meet with regularly to determine needs and direction toward achievement of personal goals in education.

LENGTH OF ACADEMIC PROGRAMS

The academic year consists of two sixteen-week semesters. Most degree programs are designed so that students may complete a degree over four regular semesters, assuming they carry the prescribed full-time credit load and do not need developmental coursework.

Students beginning programs in the spring semester may be unable to complete their degrees in the normal two-year time frame due to the sequencing of required courses.

Summer sessions are not normally included in the two-year sequence, although many students choose to enroll during the summers to take extra courses or to make up courses missed previously. Summer sessions are eight weeks in duration.

SEMESTER CREDIT HOURS

The unit of measurement for completed course work is the "semester credit hour." Each course carries an assigned value of semester credit hours. For each credit hour of lecture or recitation credit a course carries, there will be one 50 minute class meeting per week. In addition, the student can normally expect to spend two hours of out-of-class study or homework per week for each 50 minute class meeting. For most courses carrying laboratory credit hours, there will be a one hour and 50 minute meeting per week for each credit hour, with some possible additional outside assignments.

Some laboratory courses meet two hour and 50 minutes per week for each credit hour.

FULL-TIME STATUS

The minimum load for a student to be considered a full-time student is 12 semester credit hours.

STUDENT LOAD

A student may enroll in up to 18 semester credit hours of course work without special permission. Those who desire to enroll in more than 18 semester credit hours must obtain written permission from their major department and the Vice-President for Academic Affairs. Generally, a student may not enroll in more than 18 semester credit hours their first semester.

FRESHMAN/SOPHOMORE STANDING

A regular student who has graduated from high school or earned equivalence is considered a freshman (excluding "special students" (SP)). A student is considered a sophomore upon completion of 30 earned semester credit hours.

SCHEDULING OF CLASSES

A schedule of classes is established by the Vice-President for Academic Affairs and the faculty for each semester and the summer session. A copy of the class schedule can be obtained from the Admissions Office and academic departments. Classes are generally scheduled Monday through Friday between 8:00 a.m. and 5:00 p.m. A number of classes may be scheduled in the evenings to extend the services of instruction to persons who cannot attend daytime classes.

PRE-ENROLLMENT

Students planning to attend the College for the first time are encouraged to pre-enroll for courses at any of the times announced by the Registrar's Office.

Pre-enrollment allows students and advisors to plan courses early to reduce the possibility of encountering closed classes, and to reduce the time involved in the registration process prior to the start of the semester.

Students are encouraged to select courses for the following semester during the announced pre-enrollment times.

AUDITING COURSES

Auditing is attending a class regularly without the requirement of participating in class work and without receiving academic credit.

A student may enroll in a course for audit with permission from the instructor and upon payment of the course fee. Courses taken for audit will be posted to the student's transcript as audit (AU). A student may switch from regular enrollment to audit in a course until Friday of the eighth week of the regular semester, or the end of the drop period for other sessions.

CLASS ATTENDANCE

Regular and punctual class attendance is important to a high standard of work. The student is expected to recognize the importance of regular class attendance.

Each instructor is responsible for advising the students of the attendance and tardiness criteria in his class. The student is expected to know and comply with each instructor's regulations. It is the student's responsibility to make up all work missed due to the absence.

EXAMINATIONS

Examinations play a vital part in determining a student's performance in class. Each instructor will schedule a sufficient number of examinations to determine the student's progress in the course.

Final examinations are considered a part of each course and are generally scheduled during the last week in each semester and the summer session. All students are expected to take a final examination in each course during the scheduled period. In emergency cases, a student may take a final examination by arrangement.

Grading System

The Institute uses the following grade and point system:

Grade	Type of Performance	Quality (Grade) Points
A	Superior	4
B	Above Average	3
C	Average	2
D	Below Average	1
F	Failure to earn credit	0
I	Incomplete	0
AU	Audit	0
S	Satisfactory (Pass)	0
U	Unsatisfactory (Fail)	0
WP	Withdrew Passing	0
WF	Withdrew Failing	0

A grade of "S" (Satisfactory) or "U" (Unsatisfactory) will be used only for courses, so designated in course descriptions and outlines. A grade of "I" (Incomplete) may be given in special cases where a student was unable to complete all work in a course. If, in the opinion of the instructor, justifiable reasons exist to explain unfinished work, a report of Incomplete (I) may be given along with a tentative grade. (Generally, the grade earned if the unfinished work was not completed.) Incomplete grades from the spring and summer semesters must be removed prior to the beginning of the registration period for the following fall semester. Incompletes from the fall semester must be removed prior to the beginning of registration for the following spring semester. If the work is not completed by these deadlines, the tentative grade will be recorded as the permanent course grade. If no tentative grade is given, an "F" will become the permanent grade.

Quality point average (QPA) and grade point average maybe used interchangeably on campus and college records. The quality (grade) point average (QPA) for each student is reported for each semester and is a cumulative average for the entire period of attendance. This average is computed by dividing the total number of quality points earned by the total number of semester credits.

For example, five courses worth three credits each would be a total of 15 semester credit hours. If final grades of one "A", two "B's" and two "C's" are earned, then a total of 42 quality points are accumulated. To determine the quality point average (QPA or GPA), multiply credit hours by the quality point value assigned each letter grade and divide that total by the semester credit hours.

$$42 / 15 = 2.800$$

Grades are reported to the address provided by the student at the beginning of each semester. A student should consult periodically with his instructor to check their academic progress.

PRESIDENT'S HONOR ROLL

Any student carrying a full-time load (12 hours or more) and earning a 3.750 quality point average with no grade below a "C" will be listed on the President's Honor Roll for that semester.

DEAN'S HONOR ROLL

Any student carrying a full-time load (12 hours or more) and earning a 3.250 to 3.750 quality point average with no grade below a "C" will be listed on the Dean's Honor Roll for that semester.

CREDIT BY QUALIFYING EXAMINATION

Any student who feels that past education has provided the basic knowledge that is equivalent to a course may request to be given a qualifying examination for that course.

Credit may be granted by examination. Permission to take a qualifying examination should be initiated through the department head who requests a credit by qualifying examination form from the Registrar's Office.

The fee for taking a qualifying examination for course credit is three dollars (\$3.00) per semester credit hour.

After successfully completing the qualifying examination, the form will then become part of the student's permanent file and the particular courses noted on the student's transcript.

COLLEGE LEVEL EXAMINATION PROGRAM (CLEP)

CLEP provides a means of obtaining college credit for skills or knowledge obtained through experience in areas outside of the formal college environment. Any student has the opportunity to utilize for credit experience gained through employment, formal and informal study, military experience and training, and many other areas where knowledge or skill is acquired.

The College accepts for waiver of credit many of the CLEP subject examinations. Interested persons should contact the Admissions Office for details.

DROPPING OR WITHDRAWAL FROM COURSES

Students are responsible for completing all courses in which they enroll. They may drop or withdraw from any course within the limits provided below. It is the student's responsibility to insure that all drop or withdrawal procedures are completed.

Students wishing to withdraw from a class shall initiate such action with their major advisor. They will then be advised of the procedure they are to follow to complete the withdrawal action.

Refer to the academic calendar for specific dates.

1. If a drop is completed prior to Friday (5 p.m.) of the eighth week of the regular semester, no record of the class will appear on the individual's transcript.
2. A withdrawal after Friday (5 p.m.) of the eighth week through Friday (5 p.m.) of the thirteenth week of the regular semester will result in a grade of "WP" (withdrew-passing) or "WF" (withdrew-failing) depending on the class standing at the time of withdrawal.
3. For summer session and special session drop dates, consult the academic calendar supplement or contact registrar's office.

No withdrawal from courses will be accepted beginning with the fourteenth week.

The date for transaction of drops and withdrawals will be the date upon which the Registrar's office receives the form, unless corrected by the Registrar. The student is responsible to initiate and process all drops and withdrawals within appropriate time periods.

If the student is unable to appear in person, the notice should be given by letter.

WITHDRAWAL FROM COLLEGE

A student wishing to withdraw from Kansas College of Technology before the end of the semester (or course duration) is advised to contact the office of Student Services in the Administration Building and obtain a Withdrawal From College Form. The completed form must be returned along with Drop/Withdrawal Class Form for each class in which the student is enrolled before the withdrawal is official. (See Dropping or Withdrawal from Courses).

ADMINISTRATIVE DROP OR WITHDRAWAL

Students who fail to attend regularly scheduled class for two successive weeks and cannot be contacted, may at the request of the instructor and the approval of the Registrar be dropped or withdrawn from class.

If an instructor determines that the student's irregular attendance prevents him/her from obtaining minimal benefits from the course, the instructor may request the student be officially warned by the Vice President for Student Services. Students who demonstrate a lack of appropriate concern for satisfactory progress and continue irregular attendance, may be withdrawn from the class or given a grade of "F". When a student is withdrawn from a class prior to the end of the eighth week of a regular semester, no record of the class will appear on the student's record; a withdrawal after the eighth week and prior to the end of the thirteenth week of a regular semester will result in a grade of "WF".

If a student decides to appeal a withdrawal for irregular attendance, he/she must submit a written appeal to the Vice President for Academic Affairs.

ACADEMIC PROBATION AND DISMISSAL

Students are expected to attend class regularly and maintain normal progress toward the completion of their program. Students who meet the grade standards of the institution will remain in "good standing." Students failing to meet minimum grade standards will be subject to "academic probation" or "academic dismissal" according to the following rules:

Students presently in good standing who complete seven credits or more in a given semester will be placed on academic probation if their semester quality (grade) point average is below 1.800, regardless of their cumulative QPA. Students on academic probation completing seven credits or more in a given semester will be dismissed if their semester QPA is below 2.000. Students on academic probation will be returned to good standing status when they have earned a QPA of 2.000 or greater for a semester and when their cumulative QPA is 2.000 or greater. Students completing six credits or less in a given semester will not be placed on academic probation or dismissed, regardless of their semester QPA.

Students dismissed for academic performance will not be allowed to re-enroll except with the special permission of, and under conditions established by, the Academic Standards Committee.

REINSTATEMENT

Students who have been dismissed for academic reasons may petition for reinstatement.

A student desiring to be reinstated will be advised of the procedure by the Vice-President for Academic Affairs' office. Official action will be taken on the request prior to each enrollment period.

Students who are reinstated will be on academic probation for the semester in which they are reinstated and may be required to carry a reduced course load.

REPETITION OF COURSES

A course may be repeated to improve a grade. All grades received in a given course will be shown on the student's transcript. However, the grade received the last time the course is completed will be the grade used for computing the cumulative quality (grade) point average.

FEES AND REFUNDS

Tuition and fees are payable at registration. Specific semester and hourly tuition rates and fees are included in the Comprehensive Fee Schedule and Semester Class Schedule booklets.

FEE REFUND SCHEDULE

Students who wish to withdraw from any classes, or entirely from the college, must present completed, appropriate withdrawal forms to the Registrar or notify the Registrar in writing. To be eligible for a fee refund this completed withdrawal process must be within the schedule below. (Except for fees listed as non-refundable).

Regular Fall and Spring Semesters	
Through Friday the first week of classes	100%
Through Friday the second week of classes	75%
Through Friday the third week of classes	50%
Through Friday the fifth week of classes	25%
After fifth week of classes	0%

For Summer and Special sessions refer to the Comprehensive Fee Schedule.

TRANSCRIPT

The transcript is the official record of courses taken and is a record that colleges and employers use to evaluate a student or graduate of Kansas College of Technology. It must be certified by the Registrar before it will be used as an official record.

Transcript copies may be obtained by written request to the Registrar. Each student is entitled to five transcripts free of charge. A fee of one dollar (\$1.00) is charged for each additional transcript.

Transcripts and/or grades will not be released for a student indebted to the College.

DIRECTORY INFORMATION

Directory information may be released for any purpose at the discretion of the institution. Directory information includes the following information relating to a student: the student's name, address, telephone number, major field of study, participation in officially recognized activities and sports, dates of attendance, degrees, certificates and awards received, and most recent previous educational institution attended.

Directory information may be released upon inquiry according to the institution's guidelines unless the student, within 10 days after registering each semester, requests in writing the specific items for non-disclosure.

APPLICATION FOR GRADUATION

Kansas College of Technology awards degrees only once per year, at commencement ceremonies following the spring semester. Each candidate for graduation shall file a diploma application with the Vice President for Academic Affairs' Office prior to the end of the second week of classes of his or her final semester of enrollment.

Any petition which the student wishes to present in connection with his or her candidacy for graduation should be submitted prior to enrollment for the final term.

GRADUATION REQUIREMENTS

The Board of Regents is authorized by the Legislature to empower the President to grant Associate of Technology degree, Associate of Applied Science degree, or certificates by type and title as approved by the Board of Regents. Any student who plans to obtain the degree/certificate should be aware of the following criteria used by the faculty for recommending degree/certificate candidates to the President:

The candidates for the degrees/certificates must:

1. successfully complete or obtain a credit validation for each course in their field of study.
2. earn a 2.000 overall quality (grade) point average in all courses in their study.
3. be screened and recommended for graduation by the Academic Standards Committee, and
4. attend commencement exercises or obtain written permission for graduation in absentia.*

* A written request for graduation in absentia will be made as soon as the candidate becomes aware of circumstances which will prevent attendance at commencement. Such request will be directed to the Vice-President for Academic Affairs.

Any student to be considered for graduation shall have successfully completed their final fifteen (15) semester credits in residence at the College.



GRADUATION WITH HONORS

Students maintaining a high level of academic achievement are recognized at graduation by Honors and High Honors recognition.

The requirement for graduation with High Honors is that the student shall earn an overall quality point average of 3.850 or above based on a 4.000 point system, and a 3.900 in course work in the major field.

The requirement for graduation with Honors is that the student shall earn an overall quality point average of 3.750 or above, and a 3.800 in all course work in the major field.

A grade of "D" or "F" in any course will eliminate any recognition of Honors or High Honors.



LIBRARY SERVICES

The college's Library/Resource Center is located in the Technology Center Building. The library meets standards set for college libraries by the American Library Association, the American Association of Community and Junior Colleges, and the Junior College Association for Educational Communications and Technology.

It contains a collection of authoritative, up-to-date technical information. It provides supplementary reference materials which offer a wide range of modern technological subject matter. The library's subject strengths are: computer science, information systems, aeronautical technology, professional pilot, mechanical engineering technology, civil engineering technology, chemical engineering technology, and industrial engineering technology.

The unique and specialized collection of books, periodicals and non-print media is open to everyone with no charge for services. The collection is valuable, not only to the students and faculty, but to members of the community and the state as a whole.

The Resource Center houses a wide range of general information and technical periodicals, newspapers, fiction books, a reading room/lounge, typewriters, computers, a copy center, and audio/visual resource center. Telefacsimile service is also available.

An inviting atmosphere is offered in the well-lighted and attractive library. The staff is available to assist students in locating materials and in the general use of the facility.

Library services are available:

Monday–Thursday	8:00 a.m.–9:00 p.m.
Friday	8:00 a.m.–5:00 p.m.
Saturday	8:00 a.m.–12:00 p.m. 1:00 p.m.–5:00 p.m.

When classes are not in session —

Monday–Friday	8:00 a.m.–5:00 p.m.
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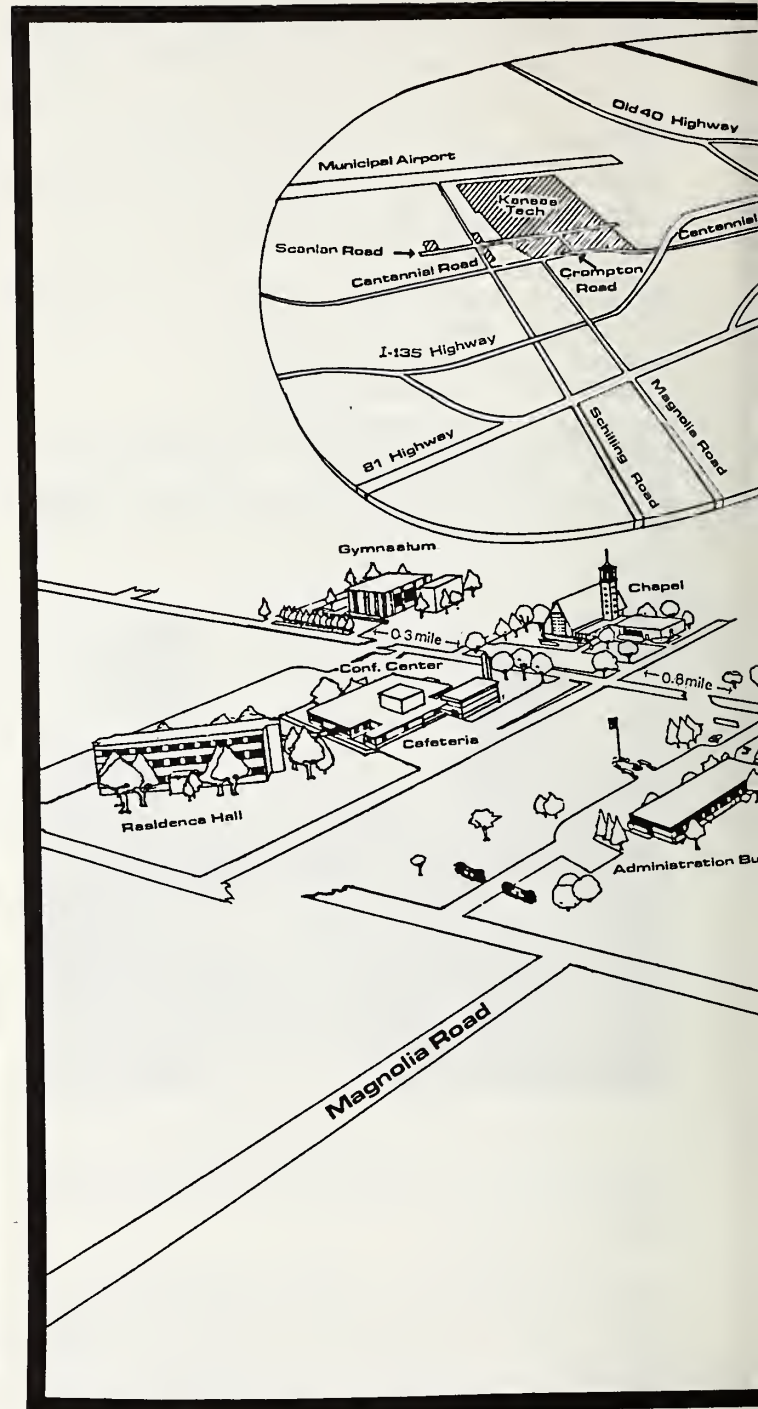
CONTINUING EDUCATION

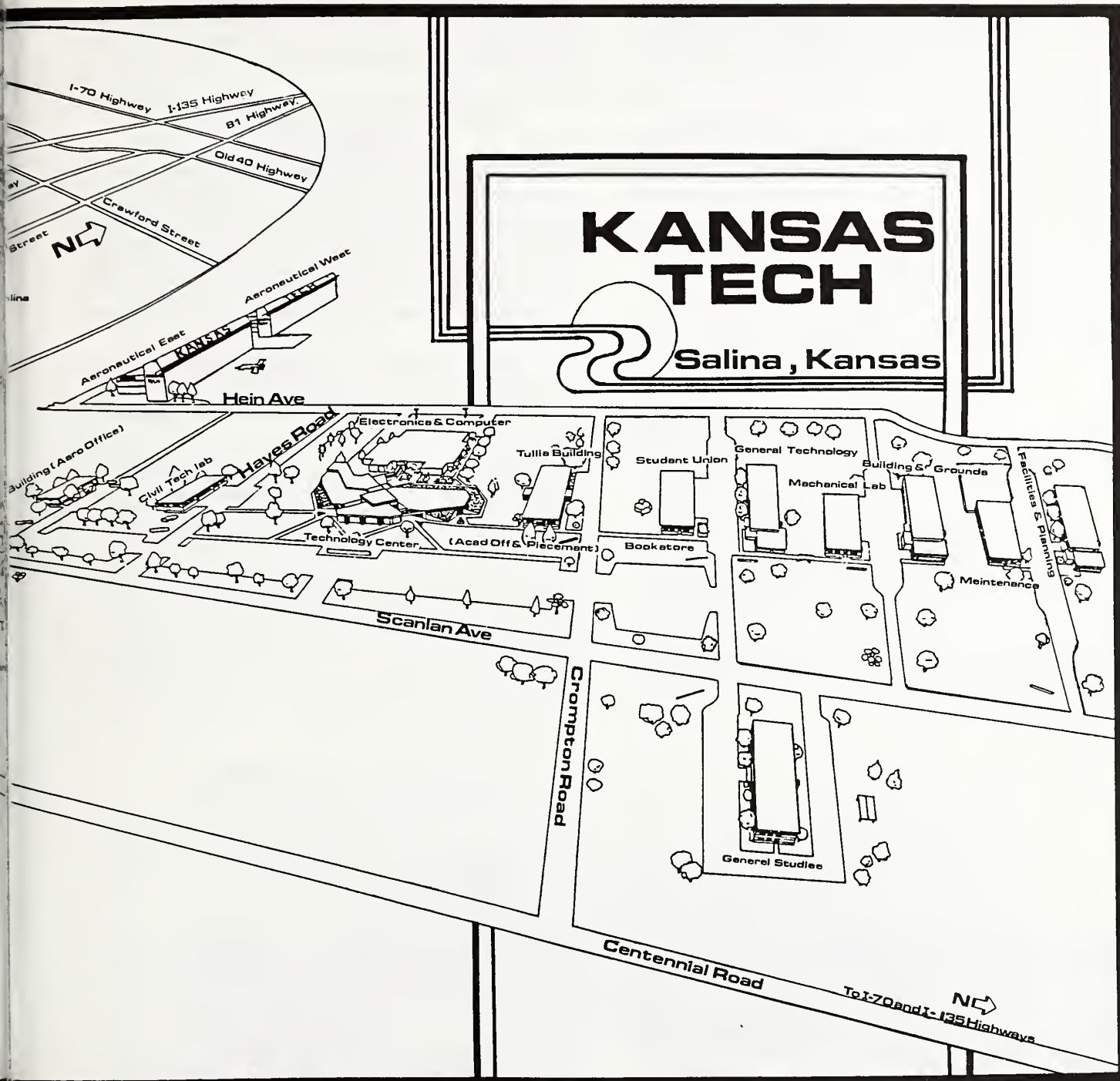
The Continuing Education Division offers special courses to meet the needs of individuals, groups, and organizations.

Workshops, seminars, short-term and full-term courses are the college's reply to the State's challenge to provide educational and developmental opportunities in the fields of technology.

Credit and non-credit courses reflect the interests and needs of the individual community or state and cover a wide variety of subjects, providing information for both occupational and personal use. Instructors are leading professional men and women on the institute's faculty. For many of these classes there are no entrance requirements and class schedules are set for the convenience of the students during both daytime and evening hours.

Special courses can be designed to meet the needs of individuals, groups, and organizations. The Continuing Education staff is eager to cooperate with firms that wish to arrange for courses, workshops or seminars in conjunction with their own training programs. These services can be provided on-campus, in-plant or in the respective communities where technical services are needed but not readily available. Continuing Education Units (C.E.U.'s) may be granted in appropriate cases. Credit courses will be indicated by code and course number. Example: AP 1512-First Line Management. This course is an adult education program course offered by Continuing Education. See page to identify courses regularly offered by continuing education.





ACADEMIC DIVISIONS/DEPARTMENTS

Kansas College of Technology is authorized to provide a wide range of instruction in science and engineering technology. A standing committee reviews the needs for technology education in Kansas and works to develop a program specifically designed to meet those needs.

There are three divisions with eight departments of instruction at the college:

Division of Aeronautics
Division of Engineering Technology
Division of General Studies

Departments of:

Aviation Maintenance
Professional Pilot Training
Civil Engineering Technology
Computer Science Technology
Electronics Engineering Technology
Mechanical Engineering Technology
Chemical Engineering Technology
Industrial Engineering Technology

Detailed curricula and course descriptions are provided in this bulletin for each of the programs of study taught by these departments.

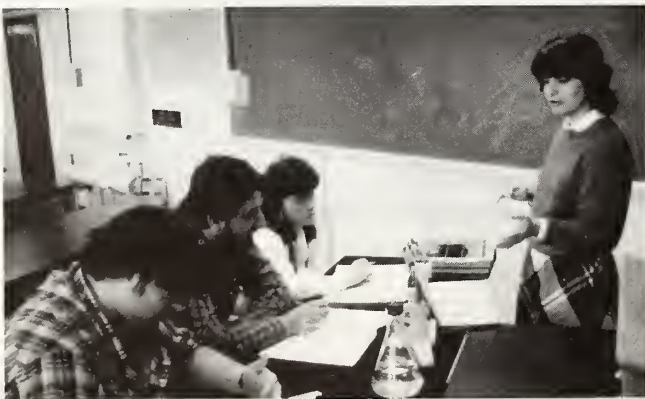
ACCREDITATION AND CERTIFICATION

The College is accredited by the Commission on Institutions of Higher Education of the North Central Association of Colleges and Schools.

The Technology Accreditation Commission of the Accreditation Board of Engineering and Technology accredits the following degrees:

Civil Engineering Technology
Computer Engineering Technology
Electronic Engineering Technology
Mechanical Engineering Technology

The Aircraft Maintenance Program is certified as an "Aviation Maintenance Technician School No. 3344" by the Federal Aviation Administration.



PROGRAM OPTIONS

A variety of program alternatives can be obtained to suit the specific interest of the student. Students should discuss those special interest subject areas with faculty members/department heads to explore options. A specific program of study can then be selected for the student at the earliest time to insure progress toward a degree objective with the least delay.

MATHEMATICS TRANSITION PROGRAM

A large number of men and women have the interest and capabilities for a satisfactory career as an engineering technician. For various reasons many of these persons have not considered such a career during their high school experience. Frequently, new students have not completed the mathematics courses that would be most helpful to them in pursuing work in this career field.

The College faculty has developed a transition program in mathematics to assist those who have, for some reason, recognized that their mathematics skills need to be upgraded.

A combination of basic mathematics applications courses and laboratory exercises assist in developing mathematical competence in students who have only fundamental working ability in math. Students will be offered a mathematics placement examination. If desired, special help will be supplied to insure students develop competence in mathematics. This allows students to be successful in the math sequence in the technology of their choosing. If a competency in math is exhibited, they may move directly into the prescribed math sequence without having to participate in the Mathematics Transition Program.

ENGLISH AND READING PROFICIENCY PROGRAMS

Like the Mathematics Transition Program, the English and Reading Proficiency Programs are designed to aid students whose level of competency in these areas may be below the normal college level.

Proficiency examinations can be administered to help identify those students who need developmental work in English and reading. The students may then enroll in Developmental English and/or Developmental Reading to prepare them for the more advanced work they will encounter. These developmental courses may be taken concurrently with other communication and technical courses.

REQUIREMENT FOR DEGREE

KEY TO MAJOR PROGRAMS OF STUDY

Majors are listed alphabetically by curricular code as follows:

AM—Aviation Maintenance (Certificate Program and Associate of Science Degree)

AT—Aviation Maintenance Technology

CH—Chemical Engineering Technology

CL—Civil Engineering Technology

CP—Computer Science Technology

CT—Computer Engineering Technology

IS—Computer Information Systems

ET—Electronic Engineering Technology

IN—Industrial Engineering Technology

PF—Professional Pilot Training

MT—Mechanical Engineering Technology

SV—Surveying Technology

Others:

SP—Special

UN—Undeclared

AP—Adult Program

The format of the course numbers is the curricular code plus a four digit number. The digits are explained in the following example:

SC 1124

SC—Department Code

1—Course Level by Year

1—Department Use Code

2—Department Use Code

4—Total Semester Credit

Parentheses at the end of a course description indicate the amount of recitation, laboratory, and semester credits for that course. The SC 1124 example has (3-1-4) which means there are three (3) semester credits of recitation, one (1) semester credit of laboratory, and four (4) semester credit total.

Information following the semester credit block indicates prerequisites or concurrence, where they may exist. The prerequisite courses must be taken before the course being described may be taken. Concurrence means that the course may be taken at the same time as the course being described.

EXAMPLE: MA 1224 has prerequisites of MA 1212 and MA 1213 which means that before taking MA 1224 (Analytic Geometry and Calculus) the student must have completed MA 1212 (Plane Trigonometry) and MA 1213 (College Algebra).

EXAMPLE: CL 1124 has concurrent course MA 1212 meaning that CL 1124 (Plane Surveying) may be taken at the same time as MA 1212 (Plane Trigonometry).

The ensuing departmental course descriptions are representative of the courses taught at the College. Kansas College of Technology reserves the right to alter course offerings and content as it deems appropriate.





AERONAUTICS DIVISION

Career opportunities have expanded in the aviation industry in recent years. The programs at Kansas College of Technology provide high quality preparation for a variety of entry level positions in aviation and related fields.

PROFESSIONAL PILOT Two year associate degree

The Cessna Pilot Center integrated flight training program is utilized to obtain a private, commercial, instrument, certified flight instructor and multi-engine ratings. The two-year associate degree emphasizes business courses as a complement to the English, math, and science requirements. Professional pilot graduates may fly as certified flight instructors, charter, business, corporate, or airline pilots.

This program requires additional costs above the standard tuition, books, and supplies. See Bulletin Supplement.



Professional Pilot (PF)

First Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
PF 1114	Private Pilot	4	0	4
PF 1111	Private Pilot Flight Lab	0	1	1
CP 1412	Computer Fundamentals	1	1	2
AM 1213	Aircraft Standards	2	1	3
MA 1213	College Algebra	3	0	3
AC 1513	Financial Accounting	3	0	3
Total Credits				16

First Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
PF 1123	Professional Pilot I	3	0	3
PF 1122	Professional Pilot I Flight Lab	0	2	2
MA 1212	Plane Trigonometry	2	0	2
EN 1713	English Composition I	3	0	3
BU 1423	Introduction to Business	3	0	3
EC 1413	Economics	3	0	3
Total Credits				16

Second Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
PF 2133	Professional Pilot II	3	0	3
PF 2233	Professional Pilot II Flight Lab	0	3	3
SH 1312	Public Speaking	2	0	2
SC 1124	Physics I	3	1	4
PF 1312	Preventive Maintenance	2	0	2
BU 1433	Marketing	3	0	3
Total Credits				17

Second Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
EN 2713	Technical Writing	3	0	3
BU 1443	Business Law	3	0	3
BU 1413	Supervisory Management	3	0	3
TRACK 1				
PF 2143	Certified Flight Instructor	3	0	3
PF 2141	Certified Flight Instructor Lab	0	1	1
	Electives*	-	-	4
TRACK 2				
PF 2242	Multi-Engine Cert.	1	1	2
	Electives*	-	-	6
Total Credits				17

Total Semester Credits required to complete the degree 66
R-recitation or lecture credit, L-laboratory credit

FAA AIRFRAME & POWERPLANT Certificate Program in AVIATION MAINTENANCE

This Applied Science degree in Aviation Maintenance is designed as a terminal degree that can be earned in two years. The degree goes beyond the Airframe & Powerplant certificate program to include critical general education courses recommended by the Board of Regents.

Airframe & Powerplant (Applied Science Aviation Maintenance (AM))

First Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
MA 1213	College Algebra	3	0	3
AM 1211	Aircraft Drawings	0	1	1
AM 1215	Aircraft Science	3	2	5
AM 1213	Aircraft Standards	2	1	3
AM 1114	Aircraft Basic Electricity	3	1	4
SH 1312	Public Speaking	2	0	2
Total Credits				18

First Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
AM 1112	Aircraft Welding	1	1	2
AM 1324	Airframe Systems	2	2	4
AM 1325	Airframe Structures & Repair	3	2	5
AM 1323	Aircraft Fluid Power	2	1	3
AM 1724	A/F & P/P Electrical Systems	2	2	4
Total Credits				18

First Year—Summer

Course No.	Course Name	Semester		Credits
		R	L	
EN 1713	English Composition I	3	0	3
EC 1413	Economics	3	0	3
PY 1113	Psychology	3	0	3
Total Credits				9

Second Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
AM 2423	Nav. Aids & Comm. Systems	2	1	3
AM 2335	Inspection & Assembly	3	2	5
AM 2333	Aircraft Finish & Fabrication	1	2	3
AM 2534	Powerplant Fundamentals	3	1	4
AM 2533	Powerplant Ignition Systems	1	2	3
Total Credits				18

Second Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
AM 2643	P/P Induction & Fuel Systems	1	2	3
AM 2542	Propellers	1	1	2
AM 2543	P/P Operation & Troubleshooting	1	2	3
AM 2644	Powerplant Overhaul	1	3	4
AM 2544	Gas Turbine Powerplant	2	2	4
MA 1212	Plane Trigonometry	2	0	2
Total Credits				18
Total semester credits to complete the degree requirements				81



AVIATION MAINTENANCE FAA Airframe & Powerplant Certificate Program

This two-year program prepares students for the Federal Aviation Administration Airframe and Powerplant Certificates. The aircraft maintenance program is fully certified as an "Aviation Maintenance Technician School No. 3344" as designated in Federal Aviation Regulation Part 147. A student who satisfactorily completes this two-year aviation maintenance program will be awarded a Certificate of Completion. Upon passing the FAA exams, given periodically in the program, the graduate will be a certified Airframe and Powerplant maintenance technician.

Airframe and powerplant mechanics inspect, repair, modify and maintain aircraft for manufacturers, commercial airlines, business, corporations, and general aviation operators.

Airframe & Powerplant Certificate Curriculum (AM)

First Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
MA 1253	Elementary Functions	2	1	3
AM 1211	Aircraft Drawings	0	1	1
AM 1215	Aircraft Science	3	2	5
AM 1213	Aircraft Standards	2	1	3
AM 1114	Aircraft Basic Electricity	3	1	4
Total Credits				16

First Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
AM 1112	Aircraft Welding	1	1	2
AM 1324	Airframe Systems	2	2	4
AM 1325	Airframe Structures and Repair	3	2	5
AM 1323	Aircraft Fluid Power	2	1	3
AM 1724	Airframe/Powerplant Electrical Systems	2	2	4
Total Credits				18

Second Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
AM 2423	Navigation Aids and Communication Systems	2	1	3
AM 2335	Inspection and Assembly	3	2	5
AM 2333	Aircraft Finish and Fabrication	1	2	3
AM 2534	Powerplant Fundamentals	3	1	4
AM 2533	Powerplant Ignition Systems	1	2	3
Total Credits				18

Second Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
AM 2643	Powerplant Induction and Fuel Systems	1	2	3
AM 2542	Propellers	1	1	2
AM 2543	Powerplant Operation and Troubleshooting	1	2	3
AM 2644	Powerplant Overhaul	1	3	4
AM 2544	Gas Turbine Powerplants	2	2	4
Total Credits				16

Total semester credits required to complete certificate requirements 68
(Includes 2080 contact hours of instruction)
R—recitation or lecture credit; L—laboratory credit



ASSOCIATE OF TECHNOLOGY AVIATION MAINTENANCE TECHNOLOGY (AT)

Associate of Technology Degree

In addition to the Aviation Maintenance Certificate program, 25 additional credits in math, English, and science fulfill requirements for an associate of technology degree in aviation maintenance. Airlines, large corporations, and aircraft companies are supporting an associate degree requirement for their supervisory positions.

This degree can be used in a 2 + 2 BS degree with Pittsburg State University.

Aviation Maintenance Technology Curriculum (AT)

Course No.	Course Name	Semester		Credits
		R	L	
MA 1213	College Algebra	3	0	3
MA 1212	Plane Trigonometry	2	0	2
EN 1713	English Composition I	3	0	3
SH 1312	Public Speaking	2	0	2
EN 2713	Technical Writing	3	0	3
SC 1124	Physics I	3	1	4
EC 1413	Economics	3	0	3
BU 1413	Supervisory Management	3	0	3
CP 1412	Computer Fundamentals	1	1	2

Total semester credits required for Associate of Technology Degree beyond Aviation Maintenance certificate 25

HELICOPTER MAINTENANCE OPTION

The student will receive instruction and experience on a variety of helicopters. Servicing, component repair, reconstruction, and troubleshooting techniques using the latest in tracking and balancing equipment will be performed.

Reciprocating and turbine powered helicopters that are flown regularly are used in the curriculum.

Students will take AT 2857 Helicopter Maintenance Summer Semesters only.

Course No.	Course Name	Semester		Credits
		R	L	
AM 2857	Helicopter Maintenance	3	4	7



AVIATION MAINTENANCE REVIEW COURSES

The Aviation Maintenance Review Courses are designed to provide training for those students qualifying under FAR 65.77. This training is usually necessary to pass the FAA written, oral and practical exams for the Airframe Powerplant certificate. The semester credit hours for this training can be applied toward requirements for an Associate degree in Aviation Maintenance. Thirty (30) semester credit hours are credited for the FAA Airframe and Powerplant certificate when enrolled in an Associate degree program at The College.

Aviation Maintenance Review Courses

AT 2204 Aviation Maintenance Review/General

The General subjects review course is designed for those individuals that have met the Federal Aviation Administration's eligibility requirements under FAR 65.77. The review conforms to the three levels of training set forth by the FAA. (3-1-4) Prerequisite: Departmental Consent

This course may be offered in two parts as:

AT 2202 Aviation Maintenance Review/General I
(2-0-2)

AT 2212 Aviation Maintenance Review/General II
(1-1-2)

AT 2313 Aviation Maintenance Review/Airframe

The Airframe subjects review course is designed for those individuals that have met the Federal Aviation Administration's eligibility requirements under FAR 65.77. The review conforms to the three levels of training set forth by the FAA. (2-1-3) Prerequisite: departmental consent

This course may be offered in two parts as:

AT 2301 Aviation Maintenance Review/Airframe I
(1-0-1)

AT 2312 Aviation Maintenance Review/Airframe II
(1-1-2)

AT 2513 Aviation Maintenance Review/Powerplant

The Powerplant subjects review course is designed for those individuals that have met the Federal Aviation Administration's eligibility requirements under FAR 65.77. The review conforms to the three levels of training set forth by the FAA. (2-1-3) Prerequisite: departmental consent

This course may be offered in two parts as:

AT 2501 Aviation Maintenance Review/Powerplant I
(1-0-1)

AT 2512 Aviation Maintenance Review/Powerplant II
(1-1-2)

AERONAUTICAL COURSE DESCRIPTIONS

AM 1112 Aircraft Welding

Theory and skill development in aircraft welding processes. Exercises in gas welding processes as applied to ferrous and nonferrous materials. Oxygen/acetylene, inert gas, and resistance welding processes are to be studied. Additional studies will be made in the following areas: welding magnesium, welding stainless steels, brazing, soldering, silver soldering. (1-1-2) Prerequisite: None

AM 1114 Basic Aircraft Electricity

A basic concept of DC and AC circuits, with basic laws relating to the following: measuring voltage, current, resistance, continuity and leakage; relationship of voltage, current and resistance in electrical circuits; reading and interpretation of electrical circuit diagrams; electrical devices and inspection and servicing of batteries. (3-1-4) Prerequisite: None

AM 1211 Aircraft Drawings

The course is designed to teach the student how to recognize and identify each kind of line as it appears in drawings, to interpret the meaning of the lines as they relate to surfaces and details in drawings. The student will make drawings illustrating major repairs or alterations, and study the reading and interpretations of blueprints. (0-1-1) Prerequisite: None

AM 1213 Aircraft Standards

A survey of the organization of the Federal Aviation Administration and the Civil Aeronautics Board. Emphasis will be placed on the regulations, standards, and specifications of each of these organizations. A detailed study of weight and balance procedures will be conducted in the classroom and in the laboratory. (2-1-3) Prerequisite: None

AM 1215 Aircraft Science

A survey of aircraft nomenclature, Basic Physics, theory of flight and aerodynamics, aircraft ground operation and servicing, and aircraft hardware, materials and processes. (3-2-5) Prerequisite: None

AM 1323 Aircraft Fluid Power

A study of basic fluid mechanics as it applies to practical applications in aircraft systems. Compressible and incompressible fluid systems will be studied. (2-1-3) Prerequisites: AM 1215 Aircraft Science, MA 1253 Elementary Functions

AM 1324 Airframe Systems

A study of the airframe systems and components to include: pressurization, heating and cooling, structural de-ice, etc. (2-2-4) Prerequisite: AM 1215 Aircraft Science

AM 1325 Airframe Structures and Repair

A study of materials commonly used in airframe structures and the associated study of making structural repairs according to recommended procedures. Skills in sheetmetal are stressed. (3-2-5) Prerequisite: AM 1215 Aircraft Science

AM 1724 Airframe/Powerplant Electrical Systems

An advanced study of DC/AC circuits law relating to circuit analysis and a detailed study of measuring instruments. Advanced study of relays, switches, alternator, and other devices encountered in circuit analysis, troubleshooting and repair. (2-2-4) Prerequisite: AM 1114 Aircraft Basic Electricity

AM 2333 Aircraft Finish and Fabrication

This course is designed to acquaint the student with the wood and fabric coverings and procedures used on aircraft, and methods used in preparation for and application of paint finishes to aircraft surfaces. (1-2-3) Prerequisite: None

AM 2335 Aircraft Inspection and Assembly

A study of assembly and manufacturing procedures, and inspection of aircraft components. This course also covers in detail annual and 100 hour inspections. (3-2-5) Prerequisites: MA 1253 Elementary Functions, AM 1211 Aircraft Drawings, AM 1215 Aircraft Science, AM 1213 Aircraft Standards

AM 2423 Navigational Aids and Communications Systems

A survey study of the aids to navigation and communications used in light and intermediate class aircraft. Operation and installation of the various types of equipment will be stressed. (2-1-3) Prerequisite: AM 1114 Aircraft Basic Electricity

AM 2533 Powerplant Ignition Systems

A study of battery, magneto high and low tension ignition systems including turbine ignitors for today's aircraft. Emphasis will be placed on trouble-shooting, repair, and timing of aircraft ignition systems. (1-2-3) Prerequisite: AM 1114 Aircraft Basic Electricity

AM 2534 Powerplant Fundamentals

A study of the principles of operation, design features and operating characteristics of reciprocating aircraft engines. Includes: overhaul inspection procedures on current horizontal opposed and radial engines. (3-1-4) Prerequisite: AM 1213 A/C Standards, AM 1215 A/C Science

AM 2542 Aircraft Propellers

A study of the use, maintenance, and inspection of propellers and their related control systems. (1-1-2)

AM 2543 Powerplant Operation and Troubleshooting

Experience in installation, operation, and removal of reciprocating engines. Engine analysis and diagnosis of malfunctions, including methods of remedy are performed on airworthy engines. (1-2-3) Prerequisite: AM 2532 Powerplant Fundamentals

AM 2544 Gas Turbine Powerplant

Advanced study of the fundamentals of gas turbine powerplants including operation, studies of supporting systems, and inspection methods are fundamental to this course. (2-2-4) Prerequisite: AM 2534 Powerplant Fundamentals

AM 2643 Powerplant Induction and Fuel Systems

A study of aircraft induction and fuel metering systems including fuels, carburetors, fuel injection systems, superchargers and other induction system components used to insure a dependable and accurate fuel supply at any flight configuration and attitude. (1-2-3) Concurrent: AM 2534 Powerplant Fundamental

AM 2644 Powerplant Overhaul

Practical experience in overhauling reciprocating engines. Some experience will be gained on radial engines; however, emphasis will be placed on airworthy small opposed engines of current popular variety. Attention will be devoted to various inspection methods, allowable tolerances, replacement procedures, and assembly. Engines are assembled and operationally checked in lab. (1-3-4) Prerequisite: AM 2534 Powerplant Fundamentals

AM 2857 Helicopter Maintenance

A study of airframe, rotor, transmission and engine components of turbine and reciprocating engine helicopters. Also includes a detailed study of required maintenance historical records, and inspection of components. Attention will be directed to safety, sound maintenance practices, assembly and rigging of rotor and engine controls. Chadwik Helm Stobex is used on airworthy helicopters for ground and in-flight balance/track procedures. (3-4-7) Prerequisite: A & P Student or consent of department. (Summer session only)

AM 2930 Problems in Aeronautical

A course in which advanced study is done in a specific area chosen by the instructor. (1 to 6) Prerequisite: Instructor's consent

PF 1111 Private Pilot Flight Lab

An introduction of the fundamentals of flight. Solo flights to include all flight operations and maneuvers necessary for meeting the aeronautical experience for the FAA Private Pilot Certificate. (0-1-1) Prerequisite: None

PF 1114 Private Pilot

The subject areas necessary for completion and passing the FAA Private Pilot Written Examination are presented. A partial listing of these subject areas include; basic aerodynamics, flight control and procedures, communication/navigation, aircraft performance, weight and balance, Federal Aviation Regulations. (4-0-4) Prerequisite: None

PF 1122 Commercial Pilot Flight Lab

An introduction to complex airplane operations and a review of those operations required of a commercial pilot. The completion of this course readies the student to take his commercial FAA flight test. (0-2-2) Prerequisite: PF 1111 Private Pilot Flight Lab

PF 1123 Professional Commercial Pilot

A continuation of PF 1114 Private Pilot knowledge for the preparation to pass the FAA Commercial Pilot written examination. Subjects include: FAR, AIM, charts, high performance aircraft, extended cross-country and meteorology planning, precision flight maneuvers. (3-0-3) Prerequisite: PF 1114 Private Pilot

PF 1312 Preventive Maintenance

This course will give the student hands-on experience with the twenty-five maintenance tasks allowed under FAR 43 entitled preventive maintenance. Legal aspects of aviation maintenance, aircraft systems, powerplant operation, considerations in buying an airplane, and annual inspections are additional subject areas included. (2-0-2) Prerequisite: None

PF 2133 Professional Instrument Pilot

A study of the procedures, regulations and techniques required to safely fly in instrument meteorological conditions within our national airspace system. The course will prepare the student to pass the FAA Instrument Airplane Written Examination. (3-0-3) Prerequisite: PF 1114 Private Pilot

PF 2141 Certified Flight Instructor Flight Lab

The needed flight skills and proper display of teaching ability will be emphasized. The demonstration of flight maneuvers with recognition of common errors in students performing the demonstrated maneuvers is stressed. Safety above all is the key to flight instruction. (0-1-1) Prerequisite: PF 2233 Professional Pilot II Flight Lab

PF 2143 Certified Flight Instructor Ground School

Instruction techniques, practices and procedures necessary to provide skill in organizing and presenting lessons. Presenting the aeronautical knowledge and developing the skills necessary for teaching will successfully prepare the student for the FAA Certified Instructor Written Examination. (3-0-3) Prerequisite: PF 1123 Professional Pilot I

PF 2233 Professional Instrument Pilot Flight Lab

Instructional flight training necessary to maneuver the aircraft safely in actual or simulated instrument meteorological conditions within the national airspace system. Thorough use and understanding of ATC procedures, safety, and aircraft control will be stressed. (0-3-3) Prerequisites: PF 1111 Private Pilot Flight Lab

PF 2242 Multi-Engine Certification

Instruction and flight experience in a multi-engine aircraft to develop the aeronautical skill and knowledge to meet the requirements for a multi-engine land class rating to the student's existing pilot certificate. (1-1-2) Prerequisites: PF 2233 Professional Pilot II Flight Lab, PF 1122 Professional Pilot Flight Lab

PF 2842 Certified Instrument Flight Instructor

Instrument instruction techniques, practices and procedures necessary to provide skills in organizing and presenting lessons in instrument flying procedures. Presenting aeronautical knowledge and developing the skills necessary for teaching will successfully prepare the student for the FAA Certified Instrument Flight Instructor written exam.

The needed flight skills and proper display of teaching ability will be emplaced. The demonstration of instrument flight maneuvers with recognition of common errors in students performing the demonstrated maneuvers is stressed. Safety, above all, is the key to flight instruction. (1-1-2) Pre-requisites: PF 2143 Certified Flight Instructor Ground School

PF 2852 Certified Multi-Engine Flight Instructor

Provides the student with the aeronautical skills and experience necessary to meet the requirements for the addition of an airplane, multi-engine rating to his/her flight instructor certificate.

The needed flight skills and proper display of teaching ability will be emplaced. The demonstration of multi-engine flight with recognition of common errors in students performing the demonstrated maneuvers is stressed. Safety, above all, is the key to flight instruction. (1-1-2) Pre-requisites: PF 2141 Certified Flight Instructor, PF 2143 Certified Flight Instructor Ground School

PF 2942 Airline Transport Pilot Rating

Provides the student with the aeronautical knowledge necessary to prepare him/her for the FAA Airline Transport Pilot written examinations.

The needed flight skills and proper display of flight maneuvers will be emphasized. The demonstration of flight maneuvers, with recognition of proper control of emergencies in compliance of the Airline Transport Pilot Practical Test Standards will be stressed. Safety, above all, is the key to safe flight. (1-1-2) Pre-requisites: Consent of instructor and evaluation of student's pilot experience as it relates to FAR 61.151 through 61.157.

CIVIL ENGINEERING TECHNOLOGY

As a result of the information explosion and the use of micro-electronics and computers, the field of Civil Engineering Technology has required better trained technicians to act as communicators between the graduate engineer and the craftsman in production and construction.

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The Civil Engineering Technician is required to stay current with these advances and must acquire the knowledge not only of current procedures and equipment, but also a knowledge of source of information from current technical publications. The technician is equipped and prepared with knowledge of construction, materials sampling and testing, construction equipment and practice, principles of surveying, structural design and fabrication, transportation systems as well as a foundation in mathematics, physical science, communications, and personnel relations.

A Civil Engineering Technician performs functions in the area of control and layout of horizontal and vertical elevations for proposed construction of buildings, bridges, and transportation facilities. This would include preliminary and final surveys, assisting in design and detailing stage, or supervision of construction to maintain quality control.

Some job titles or positions that could be filled by a graduate are: designer, project inspector, detail draftsman, construction supervisor, materials technician, technical representative, testing lab technician, surveyor trainer, engineering aide, field technician, and utility network services supervisor.

The program will equip and prepare the civil technician for employment in industries dealing with the design and construction of highways, bridges, railroads, airports, water supply and distribution projects, and other projects ranging from small scale construction jobs to those involving tremendous capital expenditures. Civil Engineering Technicians have varied employment opportunities in each of these areas.

Civil Engineering Technology Curriculum (CL)

This curriculum is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET).

First year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
MA 1213	College Algebra	3	0	3
MA 1212	Plane Trigonometry	2	0	2
CL 1312	Materials Sampling and Testing	0	2	2
MT 1112	Technical Drafting	0	2	2
EN 1713	English Composition I	3	0	3
CP 1212	Introduction to Computer Techniques	1	1	2
	*Business/Social Science Elective			2
Total credits				16

First Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
SC 1124	Physics I	3	1	4
MA 1224	Analytic Geometry and Calculus	4	0	4
CL 1124	Plane Surveying	2	2	4
CL 1222	Civil Technology Drafting	0	2	2
EN 2713	Technical Writing	3	0	3
Total Credits				17

Second Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
CL 2435	Statics and Strength of Materials	5	0	5
MT 2533	Fluid Mechanics	2	1	3
CL 2134	Route and Construction Surveying	2	2	4
CL 2322	Soils and Foundations	1	1	2
CL 2532	Construction Methods and Estimating	1	1	2
Total Credits				16

Second Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
SH 1312	Public Speaking	2	0	2
CL 2445	Structural Design	3	2	5
CL 2444	Transportation Systems	2	2	4
SC 1114	*Chemistry I			
	OR			
SC 2334	Physics II	3	1	4
	Business/Social Science Elective			3
Total Credits				18

Total semester credits required for Associate of Technology Degree 67

R-recitation or lecture credit; L-laboratory credit

*May be interchanged with proper mathematic background.

CONSTRUCTION OPTION

The construction aspects of Civil Engineering Technology are stressed allowing students to specialize in this career area. Courses are taught on contracts and specifications, construction surveying, print reading, and general knowledge of building electrical and mechanical systems. Emphasis will be in the area of heavy construction.

Construction Option Curriculum

To receive an Associate of Technology Degree in the Construction Option students must still complete 67 semester credit hours. In lieu of CL 1222, Civil Technology Drafting, and CL 2444, Transportation Systems, the following courses must be substituted to complete the Construction Option:

Course No.	Course Name	Semester		Credits
		R	L	
CL 1132	Construction Surveying	1	1	2
CL 1211	Print Reading for Civil Construction	0	1	1
CL 2523	Mechanical and Electrical Systems	2	1	3
CL 2521	Contracts and Specifications	1	0	1



SURVEYING TECHNOLOGY

Surveying is necessary for the planning, design, and layout of all major engineering projects. Surveys are used for subdivisions, buildings, bridges, railroads, highways, airports, canals, dams, irrigation and drainage projects, and in the preparation of any kind of map.

The tremendous amount of physical development has created a need for qualified surveyors at a faster rate than schools have been able to produce. Graduates for the Surveying Technology option may seek employment in the areas of construction, as government surveyors (federal, state, county, and municipal), engineering consulting, and private surveying.

It is important to note that any person who goes into private practice must be licensed. This program combined with the necessary work experience will help the individual qualify to take the Registered Land Surveyor's Examination.



Surveying Technology Curriculum (SV)

First Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
MA 1213	College Algebra	3	0	3
MA 1212	Plane Trigonometry	2	0	2
MT 1112	Technical Drafting	0	2	2
EN 1713	English Composition I	3	0	3
CP 1212	Introduction to Computer Techniques	1	1	2
SH 1312	Public Speaking	2	0	2
	Technical Elective**			3
Total Credits				17

First Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
CL 1222	Civil Technology Drafting	0	2	2
SC 1124	Physics I	3	1	4
MA 1224	Analytic Geometry and Calculus	4	0	4
CL 1124	Plane Surveying	2	2	4
CL 1123	Land Surveys	2	1	3
Total Credits				17

Second Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
CL 2435	Statics and Strength of Materials	5	0	5
CL 2134	Route and Construction Surveying	2	2	4
CL 2133	Surveying Astronomy	2	1	3
EN 2713	Technical Writing	3	0	3
	Business/Social Science Elective			2
Total Credits				17

Second Year—Spring Semester

Course No.	Course Name	Semester		Credit
		R	L	
SC 1114	Chemistry I			
	OR			
SC 2334	Physics II	3	1	4
CP 2232	Computer Graphics	0	2	2
ET 1513	Basic Electricity	2	1	3
CP 2233	Statistics with Computer Applications	2	1	3
CP 2543	Data Communications & Networking			
	OR			
CP 1123	COBOL I	2	1	3
CP 2442	Computer Science Seminar	1	1	2
Total Credits				17

Total semester credits required for Associate of Technology Degree 66
 R-recitation or lecture credit; L-laboratory credit

CIVIL ENGINEERING TECHNOLOGY COURSE DESCRIPTIONS

CL 1123 Land Surveys

A course dealing with the history of land surveying, procedures for researching records, conducting boundary surveys, writing descriptions, and producing documents which relate to the surveying of land. (2-1-3) Prerequisite or concurrent: CL 1124 Plane Surveying

CL 1124 Plane Surveying

A first (or beginning) course in the theory and practice of field measurements and notes for surveying. Topics include: use of current instruments, angle measurement, topography, leveling, traverse establishment and closure. Emphasis is placed on accuracy and avoidance of common errors and mistakes. (2-2-4) Prerequisite or concurrent: MA 1212 Plane Trigonometry

CL 1132 Construction Surveying

A study of vertical and horizontal alignment and of methods used to maintain control stations on a construction job. Topics include: sewer and sewage plant layout staking, street alignment, building layout, roadway layout, radial and coordinate staking and slope staking. Emphasis is put on practical methods and solutions to problems found on the construction job site. (1-1-2) Prerequisite: CL 1124 Plane Surveying

CL 1211 Print Reading for Civil Construction

A course dealing with methods used to retrieve information from construction plans in order to build all or part of the project. Types of plans studied include: streets, water distribution and treatment systems, sanitary sewer collection and treatment systems, highway alignment and drainage, buildings, site grading, bridges, mechanical and electrical systems. (0-1-1) Prerequisites: None

CL 1222 Civil Technology Drafting

A course in drafting the types of drawings common to civil engineering technology. These include: ownership certificates, plan and profiles, contour maps, site grading drawings and topographic layouts. Drawings are made using traditional drafting equipment and computers. (0-2-2) Prerequisite: MT 1112 Technical Drafting

CL 1312 Materials Sampling and Testing

A course in the proper use of aggregates and concrete materials (Portland cement and asphalt) in construction. Sampling and testing methods are included which conform with American Society of Testing Materials standards. Laboratory and field methods of aggregate and mix designs are emphasized. (0-2-2) Prerequisite: None

CL 1512 Introduction to Geographic Information Systems (GIS)

A class in which we will explore what a Geographic Information System (GIS) is, how GIS systems have evolved, and the myriad of applications for GIS technology. Hands-on experience will be gained using a commercial GIS software package (pc ARC/INFO) on a pc-based graphics workstation. (1-1-2) Prerequisite: MA 1212 Plane Trigonometry, CP 1212 Introduction to Computer Techniques, or Instructor's Consent

CL 1532 Photogrammetry

A class in which aerial photographs are used to create topographic drawings. Hands on experience will be gained by using stereoscopic plotters to convert photographic data into engineering maps. (1-1-2). Prerequisite: CL 1124 Plane Surveying

CL 2133 Surveying Astronomy

A course in the use of spherical trigonometric calculations to determine bearing, azimuth, latitude, longitude, and time from solar, polar and star observations. Star recognition, locations and determination of line direction are emphasized. (2-1-3) Prerequisite: CL 1124 Plane Surveying

CL 2134 Route and Construction Surveying

A course in the geometric methods of horizontal and vertical curve alignment. In addition, transitional spirals are examined and calculated. The laboratory portion provides a grounding of these concepts in the field by actual calculation and staking of control for roads, streets and various types of routes. (2-2-4) Prerequisite: CL 1124 Plane Surveying

CL 2142 Advanced Surveying

A study of the advanced areas of surveying with primary emphasis on control networks, state plane systems, tachemoetry, geodetic surveying and the use of electronic surveying equipment. (1-1-2) Prerequisite: CL 1124 Plane Surveying

CL 2143 Surveying Law

A study of the legal aspects that apply to the surveying profession, and the role of the surveyor within the judicial frame work of our court system. (3-0-3) Prerequisite: CL 1123 Land Surveys

CL 2322 Soils and Foundations

A course in the identification and classification of soils by the Unified method and the American Association of State Highway and Transportation Officials method. Routine field tests are covered and used in the laboratory. Methods of design for footings, walls, and piers are studied. (1-1-2) Prerequisite: MA 1224 Analytic Geometry and Calculus

CL 2432 Statics

A study of forces and their effects on the bodies upon which they act. (2-0-2) Prerequisites: SC 1124 Physics I

CL 2435 Statics and Strength of Materials

Statics is a study of the results of applying external loads to a body and resolution of forces in several planes. Strength of materials calculations are used to determine the internal reaction of the body to such forces. This course covers friction, centroids, moment of inertia, connections, beams, torsion and columns. (5-0-5) Prerequisite: SC 1124 Physics I

CL 2443 Strength of Materials

A study of the internal resistance to external forces. The course also deals with the resulting changes in the dimensions and shapes of bodies produced by outside forces. (3-0-3) Prerequisites: CL 2432 Statics

CL 2444 Transportation Systems

A study of the design of transportation systems with emphasis on highways, urban roadways, and railroads and airports. General topics included are roadway alignment, drainage structures and pavements. (2-2-4) Prerequisites: CL 2134 Route and Construction Surveying

CL 2445 Structural Design

A course combining design of components of structures in steel and reinforced concrete. Basic stress calculations and design concepts are studied for use in either a simplified design, detailing, or inspection role. Wood design and other materials are briefly examined. (3-2-5) Prerequisite: CL 2435 Statics and Strength of Materials or CL 2432 Statics & CL 2443 Strength of Materials

CL 2521 Contracts and Specifications

A study of the way a set of contracts and specifications are put together and how they act as a source of data on a construction job. The course stresses the way information is gained from documents with speed and accuracy. Specifications are studied and matched with plan sets. Among sections discussed are structural, mechanical, electrical, earthwork, and concrete. Among items examined and discussed are bid proposals, bonding procedures, charge orders, periodic and final payments. (1-0-1) Prerequisites: CL 1211 Print Reading for Civil Construction, CL 1132 Construction Surveying

CL 2523 Mechanical and Electrical Systems

A study of the way Mechanical and Electrical systems are used in the construction of a building by a contractor. Systems include plumbing, heating, ventilation and air conditioning. Motor, load, circuit breakers, and telemetry systems are studied. The course's purpose is to increase the future supervisor's knowledge of installation and operation of these systems. (2-1-3) Prerequisites: MA 1212 Plane Trigonometry, SC 1124 Physics I, CL 2532 Construction Methods and Estimating

**CL 2532 Construction Methods and Estimating**

A study of the basic equipment needs, usage, costs, and quantity determinations for planning and estimating construction projects. Field trips through construction sites and visitations with inspectors assist in developing reporting procedures and inspection responsibilities. (1-1-2) Prerequisite: MA 1213 College Algebra

CL 2743 Structural Steel Design

A course covering basic fundamentals of structural steel design. Stress calculations and design concepts are studied for use in either a design or inspection role. (2-1-3) Prerequisite: CL 2435 Statics and Strength of Materials

CL 2753 Reinforced Concrete Design

A course covering basic fundamentals of reinforced concrete design. Stress calculations and design concepts are studied for use in either a design or inspection role. (2-1-3) Prerequisite: CL 2435 Statics and Strength of Materials

CL 2930 Problems in Civil

A course in which advanced study is done in a specific area chosen by the student. (1 to 6) Prerequisite: Instructor's Consent

COMPUTER SCIENCE TECHNOLOGY

Advances in computer technology have made the use of computers a feasible reality for virtually all types of businesses and industries. This rapid growth in the computer industry has created a strong demand for workers with special training in the computer science field and information systems environment.

The Computer Technology Department offers programs leading to challenging careers in two areas: Computer Science Technology and Computer Information Systems Technology. In addition, the department's course offerings are utilized by the other departments on campus, since computer usage has become a very important tool in nearly all areas of technology.

Students in Computer Science and Computer Information Systems have opportunity to obtain experience with programming and operation of state-of-the-art computers which are comparable to systems used in business and industry today. Practical, applied experience is obtained on a Harris H-800 computer system and various microcomputer systems available in several laboratories, as well as digital logic test equipment for experimentation in computer hardware. The Computer Science Technology curriculum offers training in the use of computers for solution of scientific and engineering problems. Many industries including aircraft companies, energy companies, agricultural research organizations, as well as large computer manufacturers employ computer science technicians as computer programmers and program analysts in these scientific areas.

The computer programmer works closely with systems analysts who develop mathematical models of scientific and engineering problems for solution by computer. The programmer helps define problems, including input and output requirements, and prepares the actual set of instructions the computer must follow to solve problems. As a programmer/analyst the computer science graduate would do most of the mathematical formulation as well as actual programming necessary to solve a problem. Programmer/analysts frequently work directly with scientists and engineers in developing solutions to problems.

Training in the Computer Science Technology curriculum includes a strong coverage of science and mathematics as well as courses in computer programming and advanced applications of computers in scientific areas.



Computer Science Technology Curriculum (CP)

First Year—Fall Semester

Course No.	Course Name	Semester		Credit
		R	L	
MA 1213	College Algebra	3	0	3
MA 1212	Plane Trigonometry	2	0	2
CP 1113	Operating Systems	2	1	3
SH 1312	Public Speaking	2	0	2
CP 1313	Algorithmic Design	3	0	3
CP 1323	FORTRAN	2	1	3
Total Credits				16

First Year—Spring Semester

Course No.	Course Name	Semester		Credit
		R	L	
SC 1124	Physics I	3	1	4
MA 1224	Analytic Geometry & Calculus	4	0	4
CP 1423	Pascal	2	1	3
CP 1443	Assembly Language Programming	2	1	3
EN 1713	English Composition I	3	0	3
Total Credits				17

Second Year—Fall Semester

Course No.	Course Name	Semester		Credit
		R	L	
CP 2533	Applications in C Programming	2	1	3
CP 2243	Data Base Concepts	2	1	3
	Business/Social Science Electives			5
CP 2342	Data Structures	1	1	2
EN 2713	Technical Writing	3	0	3
Total Credits				16

Second Year—Spring Semester

Course No.	Course Name	Semester		Credit
		R	L	
SC 1114	Chemistry I			
	OR			
SC 2334	Physics II	3	1	4
CP 2232	Computer Graphics	0	2	2
ET 1513	Basic Electricity	2	1	3
CP 2233	Statistics with Computer Applications	2	1	3
CP 2543	Data Communications & Networking			
	OR			
CP 1123	COBOL I	2	1	3
CP 2442	Computer Science Seminar	1	1	2
Total Credits				17

Total semester credits required for Associate of Technology Degree 66
R-recitation or lecture credit; L-laboratory credit

COMPUTER INFORMATION SYSTEMS

Computer Information Systems is an emerging academic discipline with goals, subject matter, and problem-solving processes that deal with the education of users of computer technology.

The goal of the Computer Information Systems curriculum is to prepare a business applications programmer/analyst who is well-schooled in the technical aspects of computer systems, is knowledgeable of the applications area to which they are applied, and has sufficient background to be able to grow professionally in a rapidly changing field.

The subject matter includes the study of systems analysis, systems design, and applications programming. The Computer Information Systems course of study emphasizes systems development skills, which provides the fundamental problem-solving approaches; technically oriented programming, which provides the tools for implementing problem solutions; and information systems and business theory, which provides an understanding of the context within which systems are implemented.

Graduates from this curriculum are employed in a great variety of businesses with information systems functions that require individuals with skills and knowledge in accounting, database management and systems development as well as technical programming ability. These individuals function as the link between accounting practices and computer implementation within businesses such as accounting firms; manufacturing companies; public agencies, which include federal, state, and local governments; schools; hospitals; and marketing firms.



Computer Information Systems Technology Curriculum (IS)

First Year—Fall Semester

Course No.	Course Name	Semester		Credit
		R	L	
AC 1513	Financial Accounting	3	0	3
MA 1213	College Algebra	3	0	3
SH 1312	Public Speaking	2	0	2
CP 1313	Algorithmic Design	3	0	3
CP 1123	COBOL I	2	1	3
CP 1113	Operating Systems	2	1	3
Total Credits				17

First Year—Spring Semester

Course No.	Course Name	Semester		Credit
		R	L	
CP 1433	COBOL II	2	1	3
AC 1523	Managerial Accounting	3	0	3
CP 1423	Pascal	2	1	
	OR			
CP 1323	FORTTRAN	2	1	3
CP 1432	Commercial Software Analysis	1	1	2
BU 1413	Supervisory Management	3	0	3
EN 1713	English Composition I	3	0	3
Total Credits				17

Second Year—Fall Semester

Course No.	Course Name	Semester		Credit
		R	L	
CP 2632	Small Business Software Development	1	1	2
EN 2713	Technical Writing	3	0	3
CP 2223	RPG II	2	1	3
EC 1412	Economics	3	0	3
CP 2533	Applications in C Programming	2	1	3
CP 2243	Data Base Concepts	2	1	3
Total Credits				17

Second Year—Spring Semester

CP 2233	Statistics with Computer Applications	2	1	3
CP 2153	Systems Analysis & Design	2	1	3
CP 2543	Data Communications & Networking	2	1	3
BU 2423	Marketing	3	0	3
CP 1443	Assembly Language Programming	2	1	3
Total Credits				15

Total semester credits required for Associate of Technology Degree 66
R—recitation or lecture credit; L—laboratory credit

COMPUTER COURSE DESCRIPTIONS

CP 1113 Operating Systems

This introductory course introduces the CIS and CP student to the fundamental concepts of standard operating systems, compilers, one- and two-pass assemblers, translators, and procedure and job stream programming. Additional topics include scanners, linkers, loaders, and relocation processors. Specific operating systems to be examined include VOS, OCL, UNIX, and MS-DOS. (2-1-3) Prerequisites: None

CP 1123 COBOL I

Study of the COBOL programming language will introduce CIS students to algorithmic solutions using business applications. This initial programming class will stress not only the COBOL language but also concepts of modular designed structured programming and techniques. (2-1-3) Co-Requisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems

CP 1212 Introduction to Computer Techniques

Study of computer techniques and applications for the non-Computer Technology majors. Emphasis on problem solving using the BASIC programming language. Scientific programming assignments in the student's major field of study are performed on the central on-campus computer system and on microcomputer systems. (1-1-2) Prerequisite: None

CP 1313 Algorithmic Design

This course is designed as a language independent introduction to the logic of data processing. The student is introduced to set theory, venn diagrams, boolean algebra, and the reduction of natural-language statements to set-theory statements. In addition, various tools of algorithmic design are introduced including hierarchy charts, pseudocode, ANSI flowcharts, Nassi-Schneiderman diagrams and Warnier/Orr diagrams. The student is also introduced to binary, octal, and hexadecimal numbering systems. This course is also used to establish a standard for internal and external documentation to be used in all subsequent applications language classes. (2-1-3) Prerequisite: None

CP 1323 FORTRAN

Study of the computer language FORTRAN and its application to scientific and engineering problem solution. Includes study of input/output techniques, arithmetic and logic processes, non-numeric data handling, arrays and subprograms. In the laboratory students write, process, and debug scientific programs using the FORTRAN-77 compiler. (2-1-3) Prerequisites: (or concurrent) MA 1213 College Algebra, MA 1212 Plane Trigonometry

CP 1412 Computer Fundamentals

This course is designed for students seeking to develop a broad, basic familiarity with the use of the microcomputer. The course covers: 1) basic computer literacy, i.e., terminology, operations, hardware and peripherals, selection criteria, 2) analysis of common software, including spreadsheets, word processing and database programs. (1-1-2) Prerequisite: None

CP 1423 Pascal

Students will be introduced to the highly structured language of Pascal through lecture and programming assignments. Assignments will emphasize the use of modularity in program design. Data structuring and manipulation will be developed during the program lab sequence. A major project will allow students to pursue individual interests. (2-1-3) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, and CP 1423 Pascal or CP 1123 COBOL I

CP 1432 Commercial Software Analysis

CIS students will be given a thorough in-depth introduction to currently popular software application packages. Such items as word processors, spread sheets, database management systems, and integrated packages will be examined in terms of direct business/industrial applications. The current literature on commercial software will be researched in terms of fitting specific software to specific types of business/industrial tasks. Concepts of each software package (including advantages, disadvantages, limitations, and hardware requirements) will be analyzed. Particular emphasis will be placed on needs-analysis versus specific software analysis. (1-1-2) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems

CP 1433 COBOL II

This course entails a further, in-depth study of the COBOL language. More advanced topics will be covered including report writer, table processing, and the COBOL sort/merge feature. The most emphasis will be placed on file creation and updating. Sequential, indexed and relative files will be discussed. Lab work includes writing several business application programs using the COBOL language. (2-1-3) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, CP 1123 COBOL I

CP 1443 Assembly Language Programming

Programming of a mini digital computer at the Assembly language level. Specific topics covered include the following: Overview of the Harris operating system and Assembly language, the Harris central processing unit, data types and their storage, instruction format, I/O processing, the basic instruction set, array processing and control structures, the scientific arithmetic unit, linkage of Assembly subprograms to higher-level language programs, user-defined libraries and reentrant programs, sorting and searching algorithms, use of macros. (2-1-3) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, and CP 1423 Pascal or CP 1323 FORTRAN

CP 1812 Introduction to Computing

An entry level course designed to introduce to the beginning student the use of the PC type of microcomputer. Includes a familiarization with the use of MS-DOS, common terminology, computer hardware and an introduction to software usage. The software familiarization utilizes the Enable integrated software package and includes an introduction to word processing, spreadsheet and introduces the use of a database. (2-0-2) Prerequisites: None

CP 1822 Introduction to Enable

An intermediate level course designed for students with prior experience with the PC type of microcomputer. The course is designed to expand with the students knowledge of computer terminology and the MS-DOS operating system. Expanded use of the Enable word processor, spreadsheet and database is covered. (2-0-2) Prerequisites: CP 1812 Introduction to Computing or instructor permission

CP 1832 Advanced Enable

Advanced level course designed for students who have a working knowledge of computers and who have completed CP 1822 or equivalent work. Course objectives are to acquaint the student with advanced features of the Enable word processor, the automating of spreadsheets using Enable macros, and linking databases using the Enable procedural language. (2-0-2) Prerequisites: CP 1822 Introduction to Enable or instructor permission

CP 2133 Numerical Methods

This technical specialty course is designed to teach the student computer-orientated algorithms for solving mathematical problems. Laboratory exercises will explore different techniques for solution of simultaneous equations, numerical integration, differentiation, and matrix theory. (2-1-3) Prerequisites: MA 1224 Analytic Geometry and Calculus, CP 1313 Algorithmic Design, CP 1113 Operating Systems, and CP 1323 FORTRAN or CP 1423 Pascal

CP 2153 Systems Analysis and Design

This course will study the steps in conducting a systems analysis, design, and development. Initiation of the systems project to the final implementation stage will be covered along with a section on hardware selection. Laboratory work includes a class project to analyze the computer needs of a local business and recommend possible system solutions to be implemented. (2-1-3) Prerequisites: CP 1123 COBOL I, CP 1433 COBOL II

CP 2223 RPG II

This course is designed to introduce the Report Program Generator (RPG II) language. RPG II is used primarily for generation of business reports such as payroll, inventory, general ledger, and other business applications. The lab work includes writing several RPG II programs to solve business report problems. Ranging from the most basic to those involving control breaks, tables, arrays, file handling techniques and file updating. (2-1-3) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating System

CP 2232 Computer Graphics

Computer Graphics is a technical specialty course for computer majors and a related studies course for others. The course allows the students a chance to apply their knowledge of programming to computer graphics. The student will write and debug graphics programs in FORTRAN with the TEKTRONIX PLOT 10 system on the HARRIS minicomputer and in BASIC on the Zenith microcomputer. The students will have the opportunity to use a commercial Computer-Aided Design software package, a contouring software package, and a graphics based mathematics software package on the Zenith microcomputer, and a paint software system and a 3-d solid modeling software system on the Macintosh microcomputer. Upon completion of the course the students should have a fundamental knowledge of computer graphics programming, systems, and hardware. This is a technical support course. (0-2-2) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, and CP 1323 FORTRAN

CP 2233 Statistics with Computer Applications

This course is an introduction to elementary statistics with emphasis on application using the computer. Topics include description and representation of sample data, probability, theoretical distributions, sampling, estimating, correlation, regression, and computer statistical packages, including some graphing software. (2-1-3) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems and CP 1423 Pascal or CP 1323 FORTRAN

CP 2243 Data Base Concepts

Study of the design and performance of a database. This course deals with the role of the database administrator. The importance of the data dictionary, the database design process, data model comparisons, and the performance of a database. Laboratory work will include the design of individual databases. The vehicle for lab work will be dBase III. (2-1-3) Prerequisites: CP 2432 Commercial Software Analysis

CP 2342 Data Structures

An introduction to primitive through complex data structures will be accomplished via the programming language Pascal. Students will investigate the theoretical usage of various data structures and apply this theory to actual programs. A number of programming assignments through out the semester will demonstrate the practical use of data structures. (1-1-2) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, CP 1423 Pascal

CP 2442 Computer Science Seminar

This course is designed to simulate the real life development of a computer software project. The theoretical and practical applications of the software engineering process will be covered. Students will participate in group activities to produce a series of documents describing the top-down design of the software project. The actual construction, testing, and installation of the software will occur in the latter part of the semester. Additionally, time will be used to discuss timely topics and developments in the computer science field. (1-1-2) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, and CP 1423 Pascal or CP 1323 FORTRAN



CP 2533 Applications in C Programming

The syntax of the C language will be covered. Structured programming and modular design will be stressed. Writing functions and procedures will be discussed, as will the inclusion of standard library functions and calls to the operating system. The uses of C in writing application programs will be reflected in the laboratory program assignments. Students will be allowed to pursue their own special interests in a project written in C and developed in the later portion of the semester. (2-1-3) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, and CP 1323 FORTRAN or CP 1123 COBOL I

CP 2543 Data Communications and Networking

This course will cover material that leads to an understanding of how computers communicate. This course will cover both the hardware and software aspects of data communications. Students will work in the laboratory to build and observe communications circuits. Also covered will be local area networks (LAN). The principle of how they work and how to make them secure will be addressed as well as the knowledge of how to evaluate and install a LAN. (2-1-3) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, and CP 1323 FORTRAN or CP 1423 Pascal

CP 2632 Small Business Software Development

Using Microsoft BASIC as the vehicle language, this course introduces the student to business programming applications in the PC hardware environment with special consideration being given the following specific topics: Interactive sequential file processing, report and screen design, sorting techniques, data validation, random file processing, menu driven chaining operations, business graphics, and data file transfers from commercial software packages. (1-1-2) Prerequisites: CP 1313 Algorithmic Design, CP 1113 Operating Systems, CP 1432 Commercial Software Analysis

CP 2930 Problems in Computer

Opportunity for advanced study and practical experience with specific problems selected jointly by the instructor and student in the field of Computer Technology. (1 to 6) Prerequisite: Instructor's Consent



ELECTRONIC ENGINEERING TECHNOLOGY

Developments in the electronic field have expanded into every major industry and effects the daily lives of every citizen of our country. The advances in electronics have resulted in the creation of a number of new industries and accelerated the growth of others.

Positions requiring education and training in electronics exist in medicine, geology, public safety, aeronautics, law enforcement, automation, home entertainment, national defense, and in computerized controls. The applications in these fields have only scratched the surface of the potential uses for electronics. Because of the rapid growth, individuals choosing electronics as a career field have many opportunities for advancement in a challenging endeavor.

The many facets of the field have produced a need for technicians to perform a variety of jobs world-wide. To qualify for these jobs, technicians must have a good understanding of the uses of instruments and basic electronics including both theory and practice of DC and AC circuits, electronic devices, digital systems including microcomputers and linear electronics, and communications systems. Qualified graduates frequently advance to supervisory positions where technical knowledge is a necessary element of the managerial process.

Instruction in electronics is balanced between theory and practice with approximately half of the class time taking place in a practical laboratory setting working with equipment similar to that found in industry. In addition to the electronic courses the student is expected to successfully complete coursework in mathematics, science, technical writing and social studies

Students desiring a concentration in electronic communications may select an optional track of courses that permit a more intensive preparation in this area.

Electronic Engineering Technology Curriculum (ET)

This curriculum is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET).

First Year—Fall Semester

Course No.	Course Name	Semester		Credit
		R	L	
EN 1713	English Composition I	3	0	3
MT 1112	Technical Drafting	0	2	2
MA 1213	College Algebra	3	0	3
MA 1212	Plane Trigonometry	2	0	2
CP 1212	Introduction to Computer Techniques	1	1	2
ET 1114	Direct Current Circuits	3	1	4
SH 1312	Public Speaking	2	0	2
Total Credits				18

First Year—Spring Semester

SC 1124	Physics I	3	1	4
MA 1224	Analytic Geometry and Calculus	4	0	4
ET 1224	Alternating Current Circuits	2	2	4
ET 1324	Semiconductor Electronics	2	2	4
Total Credits				16

Second Year—Fall Semester

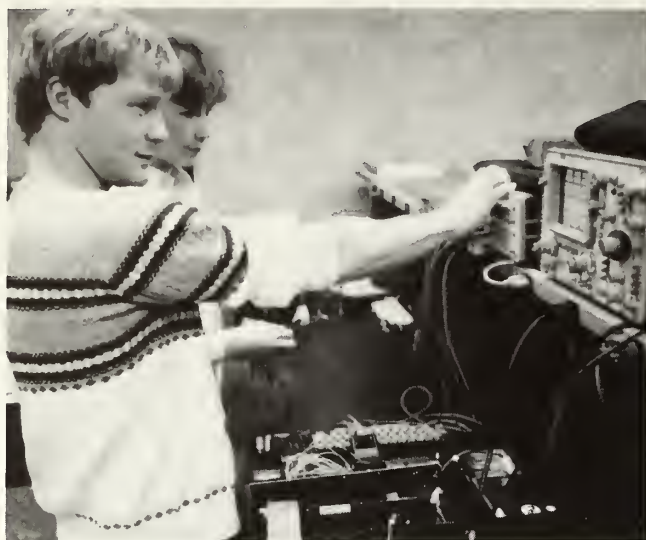
ET 2434	Electronic Measurements	2	2	
OR				
ET 2634	Communication Circuits I	3	1	4
ET 2535	Linear Circuit Design	3	2	5
ET 2631	Electronic Seminar I	0	1	1
CT 1223	Digital Electronics and Microprocessors	2	1	3
EN 2713	Technical Writing	3	0	3
Total Credits				18

Second Year—Spring Semester

ET 2944	RF Communications Systems	3	1	
OR				
ET 2644	Communication Circuits II	2	2	4
ET 2041	Electronic Seminar II	0	1	1
CT 2144	Digital System Design I	2	2	4
SC 1114	Chemistry I			
OR				
SC 2334	Physics II	3	1	4
	Business/Social Science Electives	5	0	5
Total Credits				18

Total Semester Credits required for

Associate of Technology Degree 68
R-recitation or lecture credit; L-laboratory credit



Computer Engineering Technology

New advances in electronics including the development of the microprocessor—an actual computer smaller than a postage stamp—have created a need for skilled individuals capable of working with this new technology. The Computer Engineering Technology program offers training in computer related areas.

The computer engineering technician must understand not only the electronic or "hardware" aspect of the computer, but also programming or "software" aspects. By understanding both hardware and software, the computer engineering technician can be employed in one of many computer and computer support areas including: computer hardware design, computer maintenance, factory automation, computer manufacturing and testing, computer sales and servicing. The computer engineering technician will often work closely with computer engineers, electrical engineers, and computer scientists to assist in design and development of computers and computer-based products. Job responsibilities might include: design and programming of computerized manufacturing equipment, construction of a "prototype" (first working model) of an new computer, installation of new computer systems to include training customers in use and after sale servicing of computers at the customers place of business.

Computer Engineering Technology Curriculum (CT)

This curriculum is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET).

First Year—Fall Semester

Course No.	Course Name	Semester		Credit
		R	L	
ET 1114	Direct Current Circuits	3	1	4
MA 1213	College Algebra	3	0	3
MA 1212	Plane Trigonometry	2	0	2
EN 1713	English Composition I	3	0	3
CP 1313	Algorithmic Design	3	0	3
CP 1323	FORTRAN	2	1	3
Total Credits				18

First Year—Spring Semester

Course No.	Course Name	Semester		Credit
		R	L	
ET 1224	Alternating Current Circuits	2	2	4
ET 1324	Semiconductor Electronics	2	2	4
MA 1224	Analytic Geometry and Calculus	4	0	4
SH 1312	Public Speaking	2	0	2
CT 1223	Digital Electronics and Microprocessors	2	1	3
Total Credits				17

Second Year—Fall Semester

Course No.	Course Name	Semester		Credit
		R	L	
ET 2434	Electronic Measurements	2	2	4
SC 1124	Physics I	3	1	4
CT 2144	Digital System Design I	2	2	4
CP 2533	Applications in C Programming	2	1	3
	Business/Social Science Elective			2
Total Credits				17

Second Year—Spring Semester

Course No.	Course Name	Semester		Credit
		R	L	
SC 1114	Chemistry I			
	OR			
SC 2334	Physics II	3	1	4
CT 2244	Digital System Design II	2	2	4
EN 2713	Technical Writing	3	0	3
MT 1112	Technical Drafting	0	2	2
	Business/Social Science Elective			3
Total Credits				16

Total semester credits required for Associate or Technology Degree 68
 R-recitation or lecture credit; L-laboratory credit

ELECTRONIC COURSE DESCRIPTIONS

ET 1021 Direct Current Circuits Review

Provides a coverage of D. C. Circuits. Includes a review of current and voltage concepts, resistance, power, series and parallel circuit techniques, mesh and nodal analysis, delta-wye, Thevenin's and Norton's Theorems, capacitance and inductance. (1-0-1) Prerequisites: ET 1513 Basic Electricity or equivalent, ET 1021 Direct Current Circuits Review and ET 1513 Basic Electricity may be substituted for ET 1114 Direct Current Circuits with departmental permission

ET 1114 Direct Current Circuits

A beginning course in basic circuit theory. Concepts of voltage, current, resistance, and inductance are applied to various electric circuits to analyze their behavior. Covers electrical sources, ohms law, power, resistance, series and parallel circuits. Attention is paid to the application of Thevenin's and Norton's Theorems, loop and nodal circuit analysis. Includes capacitive and inductive time constant circuits. Laboratory exercises emphasize the use of basic measuring instruments, as well as the characteristics of passive circuits and components. (3-1-4) Prerequisite: Concurrent with MA 1213 College Algebra or MA 1215 College Algebra/Math Review

ET 1224 Alternating Current Circuits

A study of Alternating Current circuits. Includes an analysis of the sine wave, polar and rectangular algebra, inductive and capacitive reactance, impedance networks, power factor correction, resonant circuits, and transformer theory. Also includes an introduction to three phase power distribution. Laboratory exercises reinforce key concepts. (2-2-4) Prerequisites: ET 1114 Direct Current Circuits, concurrent with MA 1212 Plane Trigonometry

ET 1324 Semiconductor Electronics

A survey of the family of active electronic devices. Analysis includes both graphic and mathematical models. Includes basic semiconductor theory, junction diodes, and transistors. Also includes field effect transistors, Zener diodes, optoelectronic devices, silicon controlled rectifiers, unijunction transistors and others. Laboratory periods are devoted to the measurement of device characteristics in basic circuit configurations. (2-2-4) Prerequisite: ET 1114 Direct Current Circuits

ET 1513 Basic Electricity

A survey course designed to provide the non-electronics major with an overview of basic Direct Current and Alternating Current Circuits. Topics of study include ohms law, series and parallel alternating current and direct current circuits, magnetism, capacitance, inductance, the use of polar and rectangular notation, AC power, resonance, and transformers. Laboratory exercises reinforce circuit theory and provide skills in the use of common electrical instruments. (2-1-3) Prerequisite: Concurrent with MA 1253 Elementary Functions or equivalent

ET 2041 Electronics Seminar II

The report developed for ET 2631 Electronic Seminar I is used by the student to develop the electronic hardware to a finished model. The model is tested to the original specifications. A report is prepared showing test results, design changes, and instructions on the use of the equipment. (0-1-1) Prerequisite: ET 2631 Electronic Seminar I

ET 2434 Electronic Measurements

A study of theory and operation of basic electronic instruments. Includes DC and AC ammeters, voltmeters, impedance bridges, attenuators, filters, etc. Also includes a study of amplifiers as related to sensitive AC electronic voltmeters, sensitive DC electronic voltmeters, oscilloscopes, etc. Includes an introduction to digital instrumentation along with characteristics of various transducers and sensors. Laboratory exercises provide experience in the selection of proper equipment for making measurements in electrical and electronic systems as well as interpretation of these measurements. (2-2-4) Prerequisites: ET 1224 Alternating Current Circuits, ET 1324 Semiconductor Electronics

ET 2535 Linear Circuit Design

The application of electron devices to amplifiers. Emphasis is placed on analysis and design of RC-coupled, transformer coupled and direct coupled amplifiers. Load line analysis, equivalent circuit analysis and frequency response are studied. Principles of bias stabilization and characteristics of feedback circuits are included. Operational amplifiers and their applications are introduced. The family of feedback oscillators, tuned circuits coupling and power amplifiers are covered. Laboratory exercises emphasize principles of circuit operation. (3-2-5) Prerequisites: ET 1224 Alternating Current Circuits, ET 1324 Semiconductor Electronics

ET 2631 Electronic Seminar I

An industry related course to prepare the student for his first position. The student designs an electronic circuit to a set of specifications. Includes techniques of electronic chassis construction and printed circuit board techniques. A report is prepared describing the circuits, applications and testing methods. (0-1-1) Prerequisites: ET 1224 Alternating Current Circuits, ET 1324 Semiconductor Electronics

ET 2634 Communications Circuits I

A study of transmission lines, antennas, and the propagation of electromagnetic radio frequency waves. The use of the Smith chart is emphasized in it's applications to transmission line problems. Methods and principles of the various systems of modulation are also studied, along with the circuitry incorporated in typical transmitters and receivers. Laboratory work involves the design, construction, and testing of an antenna for the FM broadcast band. Other laboratory work is devoted to matching methods for transmission lines and alignment and testing procedures for typical transmitters and receivers. (3-1-4) Prerequisites: ET 1224 Alternating Current Circuits, ET 1324 Semiconductor Electronics

ET 2644 Communications Circuits II

A study of RF circuit design, including resonant circuits, filter networks, matching networks, and transistor radio frequency amplifier design, using both "Y" and "S" parameters. Laboratory work concentrates on the practical applications of design theory and the use of modern test equipment in the measurement, analysis, and optimization of circuits. (2-2-4) Prerequisite: ET 2634 Communications Circuits I

ET 2930 Problems in Electronics

A course in which outside study is performed in a specific area selected by the student under the supervision of the assigned faculty member. (1 to 6) Prerequisite: Consent of instructor

ET 2944 RF Communications Systems

A survey of electronic communication techniques and systems. Includes amplitude modulation, frequency modulation, single-side band and pulse modulation techniques. Transmission line and antenna theory are included along with the effects of noise. The use of the Smith chart is emphasized. Laboratory work involves design and measurement along with field trips to representative sites. (3-1-4) Prerequisite: ET 2434 Electronic Measurements, ET 2535 Linear Circuit Design



CT 1223 Digital Electronics & Microprocessors

Microprocessor operation and architecture, stressing industrial applications. Topics include numbering systems, logic circuits, Boolean algebra, machine and assembly language programming, peripheral device interfacing, and microprocessor applications. Also, use of microprocessor system development tools and hardware/software debugging techniques. (2-1-3) Prerequisites: ET 1114 Direct Current Circuits, CP 1133 BASIC or CP 1212 Introduction of Computer Techniques

CT 2144 Digital System Design I

An extension of the material covered in CT 1223 Digital Electronics & Microprocessors. Covers techniques of sequential logic, analog to digital and digital to analog conversion, display systems, and microprocessors as system elements, also, the use of microprocessors for control applications. Hardware/software tradeoffs are discussed. Lab shooting using a logic analyzer. (2-2-4) Prerequisites: CT 1223 Digital Electronics & Microprocessors, ET 1324 Semiconductor Electronics

CT 2244 Digital System Design II

An Industry related course used to acquaint the student with industrial project design and development. Small group and/or individual research, design, and building of projects to implement computer based tasks specified or approved by the instructor. Written reporting including hardware and software description, testing methods, test results, and design revision. Emphasis will be on Motorola 68000 Assembly language.

INDUSTRIAL ENGINEERING TECHNOLOGY

The Industrial Engineering Technician is involved in the manufacturing process from start to finish. The first stage in manufacturing a product is research and development. In this area of work, the Industrial Engineering Technician may work as an assistant to an engineer or scientist, implementing the work to prove the validity of the product in question.

When a product has been accepted for production, preparation must be made for manufacture. In the effort the Industrial Engineering Technician assists by working on a layout. Others work as estimators, conduct studies to determine costs of required materials, necessary labor, and plant space required for production.

After the production of a product begins, technicians work toward perfecting the manufacturing process to make the product a most profitable venture. This is accomplished through the time study to determine whether production time is being used efficiently in each manufactured process.

After the product is manufactured, technicians may assist with storage and shipping problems where as other technicians may assist in customer relations where servicing or installation is required.

The technician then working in design or manufacturing assists and coordinates the manufacturing process from the development and design stage to such final stages as customer servicing.

ENTRY LEVEL JOBS

Completion of an Industrial Engineering Technician program qualifies a student for entry into many different jobs with many different employers. The following job descriptions are only representative of a much larger number. The list of job descriptions would include: Quality Control Technician, Time and Motion Study Technician, Engineering Technician (Safety), Engineering Specification Technician, Cost Estimator Technician, Order Analyst Technician and Plant Layout Technician.

INDUSTRIAL ENGINEERING TECHNOLOGY CURRICULUM (IN)

First Year—Fall Semester				
Course No.	Course Name	Semester		Credit
		R	L	Total
MA 1212	Plane Trigonometry	2	0	2
MA 1213	College Algebra	3	0	3
CP 1212	Introduction to Computer Techniques	1	1	2
MT 1112	Technical Drafting	0	2	2
EN 1713	English Composition I	3	0	3
SC 1114	Chemistry I	3	1	4
Total Credits				16

First Year—Spring Semester				
Course No.	Course Name	Semester		Credit
		R	L	Total
ET 1513	Basic Electricity	2	1	3
MA 1224	Analytic Geometry & Calculus	4	0	4
SC 1124	Physics I	3	1	4
CP 1323	FORTRAN	2	1	3
SH 1312	Public Speaking	2	0	2
	Business/Social Science Humanities Elective	2	0	2
Total Credits				16

Second Year—Fall Semester				
Course No.	Course Name	Semester		Credit
		R	L	Total
IN 2643	Electric Power & Devices	1	2	3
CL 2435	Statics & Strength of Materials	5	0	5
SC 2334	Physics II	3	1	4
EN 2713	Technical Writing	3	0	3
MT 1212	Manufacturing Methods I	1	1	2
Total Credits				17

Second Year—Spring Semester				
Course No.	Course Name	Semester		Credit
		R	L	Total
MT 1223	Manufacturing Methods II	1	2	3
CH 2522	Instrumentation & Control	1	1	2
IN 2633	System Analysis & Quality Control	3	0	3
CH 2712	Plant Engineering Technology	2	0	2
CH 1324	Chemistry II	2	2	4
	Business/Social Science Humanities Elective	3	0	3
Total Credits				17
Total semester credits required for Associate of Technology Degree				66
R-recitation or lecture credit; L-laboratory credit				

INDUSTRIAL ENGINEERING TECHNOLOGY COURSE DESCRIPTIONS

IN 2633 System Analysis and Quality Control

An introductory course in system analysis and statistical quality control, including work in the areas of basic logic, truth tables, and methods for determining necessary requirements for specific levels of finished product quality. The basic rules of reason are explored as fundamental concepts. (3-0-3) Prerequisite: MA 1213 College Algebra or MA 1215 College Algebra with Math Review

IN 2643 Electric Power and Devices

An approach to technical understanding of the concepts and uses of alternating current power in industry. Strong alternating current theory with emphasis on motor speed controls, phase shifts, control systems, simpler forms of logic switching circuits, process systems with self-check, and servo loop principles. Various forms of transducers are examined. Field trips are made to study representative motors and load control systems. (1-2-3) Prerequisite: ET 1513 Basic Electricity, MA 1212 Plane Trigonometry

CHEMICAL ENGINEERING TECHNOLOGY

Chemical Engineering Technology relates to industrial processes in which raw materials are changed chemically or physically into useful products. Fuels, plastics, synthetic fibers, pharmaceuticals, food additives, inorganic chemicals, and organic chemicals are examples of the wide variety of products in the chemical industry.

Graduates of this program are qualified to perform in chemical production plants, pilot plants, analytical laboratories, research and development laboratories and sales related to chemicals or chemical manufacturing equipment. Job responsibilities of a chemical engineering technician frequently involve providing support to chemical engineers in process development and design, plant operation, operator-training, compilation of performance reports, pilot-plant set up, and preparation of information for computer analysis.

Chemical Engineering Technology students gain laboratory experience in instrumental analysis, organic chemistry, unit operations, and process control laboratories. In addition, students are encouraged to pursue summer internship in the chemical industry, when such positions are available.

Salaries offered in the chemical industry rank among the highest of all industries. The continued need for a clean environment, energy sources, plastics, health care products, and many other chemical products clearly indicates that challenging and rewarding careers lie ahead for chemical engineering technicians.



Chemical Engineering Technology Curriculum (CH)

First Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
CP 1212	Introduction to Computer Techniques	1	1	2
MT 1112	Technical Drafting	0	2	2
EN 1713	English Composition I	3	0	3
MA 1212	Plane Trigonometry	2	0	2
MA 1213	College Algebra	3	0	3
SC 1114	Chemistry I	3	1	4
Total Credits				16

First Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
CH 1423	Material and Energy Balances	3	0	3
MA 1224	Analytic Geometry and Calculus	4	0	4
SC 1124	Physics I	3	1	4
	Business/Humanities/ Social Science Elective	3	0	3
SC 1324	Chemistry II	2	2	4
Total Credits				18

Second Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
CH 2414	Unit Operations I	2	2	4
CH 2312	Chemical Reactions	1	1	2
CH 2134	Organic Chemistry	3	1	4
CH 2524	Industrial Processes	2	2	4
IN 2643	Electric Power and Devices	1	2	3
Total Credits				17

Second Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
CH 2424	Unit Operations II	2	2	4
CH 2522	Instrumentation & Control	1	1	2
CH 2622	*Process Design Lab	0	2	2
SH 1312	Public Speaking	2	0	2
	Business/Humanities/ Social Science Elective	2	0	2
CH 2712	Plant Engineering Technology	2	0	2
EN 2713	Technical Writing	3	0	3
Total Credits				17

Total semester credits required for Associate of Technology Degree 68
 *Enrollment in either Internship or Process Design Lab is required. Internship may be undertaken in Summer Session between the first and second year or in the Summer Session following the second year.
 R—recitation or lecture credit, L—laboratory credit

CHEMICAL ENGINEERING TECHNOLOGY COURSE DESCRIPTIONS

CH 1324 Chemistry II

An in-depth investigation into chemical analysis which includes equilibrium in solutions, gravimetric analysis, solubility product principle, buffer solutions, acid-base and oxidation-reduction titrations, statistical evaluation of chemical analysis data, and an introduction to analytical automation. Laboratory work involves qualitative and quantitative determinations using wet and instrumental methods. (2-2-4) Prerequisite: SC 1114 Chemistry I

CH 1423 Material & Energy Balances

Material balance problem solutions by direct, algebraic and tie-component methods including recycle, bypass and purge calculations. Ideal and real gases, vapor pressure, saturation and humidity. Heat capacity, enthalpy change and steam-property evaluation. General energy balance including energy balances with chemical reactions. Heat of solution and mixing. (3-0-3) Prerequisites: SC 1114 Chemistry I, MA 1213 College Algebra

CH 2134 Organic Chemistry

A study of the reaction mechanism of industrially important reactions, namely: alkylation, aromatization, dehydration, halogenation, hydrogenation, isomerization, nitration, oxidation-reduction, pyrolysis and polymerization. Applications of these reactions in the study of hydrocarbons, alcohols, ethers, aldehydes, ketones, carboxylic acids, and carbohydrates. Laboratory work emphasizes the analysis and synthesis of representative organic compounds. (3-1-4) Prerequisite: SC 1114 Chemistry

CH 2312 Chemical Reactions

Review of fundamental kinetic and thermodynamic relations. Energy balances with chemical reactions. Batch, plug flow and mixed flow reactors. Introduction to reactor operation and design. Laboratory includes experimentation with various chemical reactions to illustrate thermodynamic and kinetic principles. (1-1-2) Prerequisites: MA 1224 Analytic Geometry & Calculus, CH 1423 Material & Energy Balances, SC 1324 Chemistry II

CH 2414 Unit Operations I

Equation of continuity, Bernoulli's Equation and application to sizing of pumps and compressors. Flow measurement and pipe sizing. Heat transfer by conduction, convection and radiation. Overall heat transfer coefficient and application to heat exchanger sizing. Overview of evaporation, mixing, filtration, crushing and grinding. Laboratory involves experimental work in the Unit Operations studies in the lecture. (2-2-4) Prerequisites: SC 1124 Physics I, CH 1423 Material & Energy Balances

CH 2424 Unit Operations II

Phase equilibria and its application to the study of distillation, liquid extraction, and gas absorption. Additional topics include humidification, dehumidification, filtration, and drying operations and their application in industry. Laboratory involves experimental work in the unit operations studied in lecture. (2-2-4) Prerequisite: CH 2414 Unit Operations I

CH 2522 Instrumentation & Control

Principles of measurement and control. Transfer functions and their application to control of temperature, pressure, liquid-level and concentration. Laboratory involves experimental work with a liquid-level, and temperature control system. (1-1-2) Prerequisite: SC 1224 Physics I and MA 1224 Analytic Geometry and Calculus

CH 2524 Industrial Processes

A broad survey of chemical process industries with emphasis on process flowsheet interpretation. Course work includes study of petroleum refining, natural gas processing, chlor-alkali, ammonia, fertilizer, fermentation and nuclear industries. Overview of water-conditioning and environmental protection. Laboratory work involves testing of water, fuels, and select chemicals by instrumental methods including molecular, atomic and mass spectroscopy, radioisotope methodology, and gas liquid chromatography. (2-2-4) Prerequisite: SC 1324 Chemistry II

CH 2612 Internship

Student works as a summer intern in chemical or allied industry. A report detailing duties performed and tasks accomplished required at the end of the internship period. (0-2-2) Prerequisite: None. Recommended between first and second year.

CH 2622 Process Design Lab

Student is assigned a project which requires equipment set up, experimentation, data collections preferably done on computer. A project report will be required. (0-2-2) Prerequisites: CH 2414 Unit Operations I, concurrent with CH 2424 Unit Operations II

CH 2712 Plant Engineering Technology

Introduction to unit operations and chemical engineering and chemical processing equipment. Materials of construction and corrosion, materials handling, maintenance, utilities and services, and plant safety. Evaluation of purchased equipment and equipment depreciation costs. Overview of plant design report. (2-0-2) Recommended for second year students.



MECHANICAL ENGINEERING TECHNOLOGY

The Mechanical Engineering Technology program prepares the graduate for a position in mechanical and/or manufacturing industries. This program embraces the design, manufacture and production of mechanical products and the tools, machines, and processes by which they are made. It also deals with sales and maintenance of such products, tools, and machines. The two-year program is designed to develop the student's ability to proceed in an independent manner to use both trade and technical literature to solve technical problems.

The first year of study finds the mechanical technology student developing a strong base in areas of mathematics, physical science, manufacturing processes, written and graphic communications. During the second year, the student develops abilities in such areas as materials of industry, fluid mechanics, mechanisms, CNC machine processes, and designs of mechanical elements.

Mechanical Technology, though not a new science, has continually been an exciting and rewarding field involved with development of products. New product ideas in energy, transportation, product manufacturing, and other areas involving mechanical devices indicate rapid advances in the field.

The mechanical engineering technician is concerned with the development, testing, evaluation detailing and design of machinery, equipment, instruments and other mechanical devices. The technician's duties may involve drafting, use of handbooks and tables, calculations of strength and reliability, selection of materials, and cost estimating for the development or modification of the design of almost any type of machine or mechanism. Technicians may conduct performance and endurance tests on various mechanical devices and report the results.

MECHANICAL ENGINEERING TECHNOLOGY CURRICULUM (MT)

This curriculum is accredited by the Technology Accreditation Commission of the Accreditation Board of Engineering and Technology (TAC/ABET)

First Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
MA 1212	Plane Trigonometry	2	0	2
MA 1213	College Algebra	3	0	3
MT 1111	Descriptive Geometry	0	1	1
MT 1112	Technical Drafting	0	2	2
MT 1212	Manufacturing Methods I	1	1	2
EN 1713	English Composition I	3	0	3
CP 1212	Introduction to Computer Techniques	1	1	2
Total Credits				15

First Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
SC 1124	Physics I	3	1	4
MT 1323	Metallurgy	2	1	3
MT 1122	Mechanical Detailing	0	2	2
MT 1222	Manufacturing Methods II	1	2	3
EN 2713	Technical Writing	3	0	3
	Business/Social Science Elective			3
Total Credits				18

Second Year—Fall Semester

Course No.	Course Name	Semester		Credits
		R	L	
SC 1114	Chemistry I			
	OR			
SC 2334	Physics II	3	1	4
CL 2435	Statics and Strength of Materials	5	0	5
MT 2533	Fluid Mechanics	2	1	3
MT 2433	Elements of Mechanisms	3	0	3
MT 2432	Design Technology I	1	1	2
MT 2141	Introduction to Computer-Aided Drafting			
Total Credits				18

Second Year—Spring Semester

Course No.	Course Name	Semester		Credits
		R	L	
MA 1224	Analytic Geometry and Calculus	4	0	4
SH 1312	Public Speaking	2	0	2
MT 2341	Mechanical Testing Lab	0	1	1
MT 1722	Thermodynamics I	2	0	2
ET 1513	Basic Electricity	2	1	3
MT 2444	Design Technology II	2	2	4
	Business/Social Science Elective			2
Total Credits				18

Total semester credits required for Associate of Technology Degree 69
R—recitation or lecture credit; L—laboratory credit

MECHANICAL COURSE DESCRIPTIONS

MT 1111 Descriptive Geometry

Orthographic solution involving the point, line and plane projections, intersections, and surface development of solids, bearings, slope, true length, and true size using descriptive geometry. (0-1-1) Prerequisite: Concurrent with MT 1112 Technical Drafting

MT 1112 Technical Drafting

Lettering, freehand sketching, use of drafting equipment. Theory and applications of orthographic projection and pictorial drawings. Standards for symbols, section views, and dimensioning included. The student is also introduced to the CAD systems. (0-2-2) Prerequisite: None

MT 1122 Mechanical Detailing

Preparation of shop drawings for manufacturing, fabrication or assembly. Specifications of size, shape, material and manufacture. Specifications of standard fasteners, including threads, rivots, keys, splines. Allowance specifications for mating parts and surface quality. Introduction to graphic illustration. CAD is used in conjunction with this course. (0-2-2) Prerequisite: MT 1112 Technical Drafting

MT 1212 Manufacturing Methods I

Study and practice in gas, arc, TIG welding, spot weld, weld testing, cost estimation. Introduction to welding metallurgy and special welding processes. (1-1-2) Prerequisite: None

MT 1223 Manufacturing Methods II

Laboratory practice in performing basic machine shop operations on lathes, milling machines, drill presses. Use of hand tools, metal cutting machines and grinders included. Laboratory observation of foundry, and CNC machine processes. (1-2-3) Prerequisite: None

MT 1323 Metallurgy

Basic principles of physical metallurgy. Structure of metals and alloys. Phase transformations of ferrous and non-ferrous metals. Testing and microscopic examination of metals. (2-1-3) Prerequisite: None

MT 1722 Thermodynamics I

Thermodynamic laws and equations. Use of tables and charts for properties of important fluids. Applications to systems used for producing, transforming, and applying heat and mechanical energy. Brief introduction to heat transfer. (2-0-2) Prerequisite: MA 1213 College Algebra

MT 2141 Introduction to Computer Aided Drafting

This course introduces the use of computers as an aid to solving technical drafting and design problems. Topics covered include generative graphics, hardware and software, point plotting and line drawing, graphics programming, equation programmed figures, dimensioning and annotations, and the production of finished drawings. Prerequisite: MT 1112 Technical Drafting

MT 2341 Mechanical Testing Laboratory

Principles of mechanical testing. Instrumentation and measurement in the areas of loads, stresses, deformations, heat flow, and other qualities. Preparation of written laboratory reports. (0-1-1) Prerequisite: CL 2435 Statics and Strength of Materials

MT 2432 Design Technology I

A study of the design process. Use of handbooks and industrial catalogs to select components including belts, chains, gears, springs, clutches and bearings to satisfy design requirements. Introduction to the use of computers in solving design problems. (1-1-2) Prerequisite or concurrent: MT 2433 Elements of Mechanisms

MT 2433 Elements of Mechanisms

Fundamental motion concepts of displacement, velocity and acceleration. Analytical and graphical analysis and synthesis of linkages, gear trains, cams, pulleys and combinations of these elements. (3-0-3) Prerequisites: SC 1124 Physics I and MT 1112 Technical Drafting

MT 2444 Design Technology II

Continued study of design process. Investigation of theories of failure, stress analysis, stress concentration, deflections, materials, and costs relating to machine design. Group laboratory design projects requiring application of previously learned concepts and methods in detailing, manufacturing, mechanisms, and other courses relative to machine design. (2-2-4) Prerequisites: CL 2435 Statics and Strength of Materials and MT 2432 Design Technology I

MT 2533 Fluid Mechanics

Fundamental concepts of fluid mechanics. Study of buoyancy, energy equation, viscosity, flow measurement. Selected applications of fluid mechanics to civil and mechanical fields. BASIC language programming exercises are included in this course. (2-1-3) Prerequisites: MA 1212 Plane Trigonometry and MA 1213 College Algebra

MT 2930 Problems in Mechanical

Opportunity for advanced study and practical experience with specific problems of the student's choice in the field of Mechanical Technology. (1-6) Prerequisite: Instructor's Consent

AUTOMATED MANUFACTURING OPTION

Manufacturing industries are changing at an unprecedented rate, largely due to the impact of computers. Both computer and changing market have required.

The automated manufacturing option is being developed to allow for more concentrated study in manufacturing processes including both traditional such as welding, forming, casting, machining, quality control, computer-aided manufacturing, robotics and others that are required in the manufacture of a product will be included in this option.

This option allows for nine credit hours of the current Mechanical Engineering Technology curriculum to be replaced with the following topic courses.

Instrumentation and Controls
Automated Manufacturing Systems I
Automated Manufacturing Systems II

Speciality courses for this option are expected to be offered starting the fall semester of 1990.



GENERAL EDUCATION REQUIREMENTS

Kansas College of Technology programs are intended to provide students the opportunity to acquire sufficient specialization in the technical field of their choice as well as sufficient general education background intended to enhance the student's common knowledge, attitudes and communication skills that responsible individuals in today's society should possess. Each curriculum has general education requirements which must be completed for the appropriate degree.

GENERAL EDUCATION COURSE DESCRIPTIONS

DEVELOPMENTAL STUDIES

DS 1102 College Skills

A course designed to aid the student who sees a need or is perceived to need help or information in study skills such as note-taking, time management, test-taking, and reading comprehension. Other topics covered are career planning, placement, work processing, social adjustment, and survival skills for college. (2-0-2) Prerequisite: None

DS 1103 Developmental English

Basics of Standard Edited (written) English with emphasis on grammar, usage, and sentence structure leads to clear correct composition. This course does not fulfill requirements for the Associate degree. (3-0-3) Prerequisite: None

DS 1512 Reading Improvement Lab

Supervised self-study in reading skills for students who have special problems in reading, and for students who wish to achieve an above average proficiency in reading. A voluntary course earning two hours of credit. (0-2-2) Prerequisite: None

MATHEMATICS COURSES

MA 1101 Technical Science

A 1-hour non-degree credit course that coordinates the principles in Beginning Algebra with selected physical science activities. The students will collect and analyze the data from each physical science activity long hand and with the aid of microcomputers. (0-1-1) Prerequisite: None

MA 1224 Analytic Geometry & Calculus

A unified presentation dealing with the emphasis on elementary topics in Calculus and certain selected topics from more advanced areas. These have been selected due to their application in the technologies. The topics are developed in a non-rigorous and intuitive manner, with emphasis being placed on the interpretation and applications of material presented. (4-0-4) Prerequisites: MA 1213 College Algebra or MA 1215 College Algebra with Math Review and MA 1212 Plane Trigonometry

MA 1253 Elementary Functions

A three-credit hour course composed of two credit hours of in-class lecture and one credit hour of laboratory. The lecture portion to include basic algebraic, geometric and trigonometric concepts. The course is designed to improve the students understanding of the basic algebraic and trigonometric concepts and to improve his problem-solving abilities. The purpose of the laboratory is to help review mathematic concepts, provide individual help, and apply mathematical concepts, related to the students technical area. (2-1-3) Prerequisite: None

MA 1222 Logic

Set theory is introduced on an intuitive basis and developed as a mathematical structure to include Boolean Algebra. Symbolic logic will be introduced and then will be applied to the solutions of problems including statements, truth tables, arguments, and proofs. (2-0-2) Prerequisite: None

MA 1225 Calculus I

Course content includes a brief review of pre-calculus materials of algebra and trigonometry, functions, limits, differentiation, applications of differentiation, integration, and applications of the definite integral. Where possible, theory is presented in a style tailored for first semester students of mathematics. (5-0-5) Prerequisites: MA 1213 College Algebra and MA 1212 Plane Trigonometry

SCIENCE

SC 1114 Chemistry I

A study of the atomic structure, periodic law, chemical bonding, stoichiometry, states of matter, solutions, chemical thermodynamics, chemical and ionic equilibrium, electrochemistry, and an introduction to organic chemistry. Laboratory work stresses techniques in chemical manipulations and data collection. (3-1-4) Prerequisite: None Concurrent recommendation: MA 1213 College Algebra

MA 1212 Plane Trigonometry

The fundamentals of College Trigonometry with emphasis on applications to engineering technology. Course content includes right and oblique triangle solutions, vectors, polar coordinates, angular velocities, use of trigonometry in surveying, tool and machine design, sine and cosine law uses, introduction to identities solutions, and an introduction to the conic sections. Students are placed in this course on the basis of their score on the Campus Math Placement Exam or ACT score. (2-0-2) Prerequisite: None

MA 1213 College Algebra

The fundamentals of Algebra, as taught at the college level, modified to emphasize applications and de-emphasize theoretical developments. In particular, certain properties and theorems are stated without proof. Course content includes identifying number sets up to and including complex numbers, fundamental concepts of Algebra as a review, operations with algebraic fractions, exponents and radicals, logarithms, linear equations in one and multiple variables, linear functions and graphs, systems of equations, determinants, matrices, quadratic equations, solutions involving higher degree equations, graphical and algebraic solution of inequalities and absolute inequalities in one and two variables, direct, indirect and joint variation and binomial Theorem. Students are placed in this course on the basis of their score on The Campus Placement Exam or ACT score. (3-0-3) Prerequisite: None

MA 1215 College Algebra/Math Review

A reduced pace College Algebra course with five contact hours per week. The course will cover the same material as MA 1213 College Algebra with approximately the first two weeks emphasizing Technical Mathematics. The student will receive 5 hours of credit, 3 of which will count towards graduation. Students are placed in this course on the basis of their score on the Campus Math Placement Exam or ACT scores. (5-0-5) Prerequisite: None

MA 1515 Beginning Algebra

A credit course in the principles of intermediate algebra. The course includes a review of basic mathematics which includes addition, subtraction, multiplication, and division of fractions, integers, algebraic fractions, polynomials, and an introduction to solving equations, factoring, exponents and trigonometric concepts. (5-0-5) Concurrent: Recommendation MA 1101 Technical Science

SC 1124 Physics I

A quantitative investigation into the fundamentals of mechanics, heat and fluids. The class work and the supportive laboratory are specifically designed to provide the student with an understanding of and a proficiency in measurement and calculation with these principles as they are applied to the solution of technical problems. (3-1-4) Prerequisites: MA 1213 College Algebra and MA 1212 Plane Trigonometry

SC 2334 Physics II

A quantitative investigation of thermodynamics, wave motion, sound, light, and atomic physics. The class work and the supporting laboratory are designed to provide the student with an understanding of, and a proficiency in measurement and calculation with these principles as they are applied to the solution of technical problems. (3-1-4) Prerequisite: SC 1124 Physics I

ENGLISH/COMMUNICATIONS

EN 1101 Publications Practice I

Students will learn the basic aspects of newspaper publication from news writing to photography, layout, design, editing and interviewing. Students will also learn the use of Wordstar 2000 and basic darkroom procedures. One hour of lab time will be required each week to give students hands-on experience with the Campus Newspaper. (0-1-1) Prerequisite: None

EN 1123 Literature and Technology

Literature and Technology is a three hour elective course. Students will read literature about technology from a variety of perspectives. The literature will include novels, short stories, articles, and excerpts from other types of writing. A final paper, in which the student presents his/her own view of technology and its role in civilization, is required. (3-0-3) Prerequisite: EN 1713 English Composition I or EN 1714 English Composition I/Developmental English

EN 1201 Publications Practice II

Students will learn the basic aspects of magazine and yearbook production from feature writing to editing, layout and design. Students will also become familiar with basic Desk Top Publishing and learn Page Maker on the MacIntosh computer. One hour of lab time will be required each week to give students hands-on experience working on the campus magazine Eramus and the Yearbook. (0-1-1) Prerequisites: None

EN 1713 English Composition I

English Composition I is designed to acquaint the student with grammatical and rhetorical skills. Topics covered include vocabulary growth, sentence structure, punctuation, spelling, modes of development (definition, description, classification, etc.), aims of discourse (expression, persuasion, etc.), and paragraph and essay structure. Introduction to word processing will be presented during the first two weeks of course. (3-0-3) Prerequisite: None

EN 2713 Technical Writing

Technical Writing applies rhetorical skills to the special writing needs of business and industry. Special emphasis is placed on the writing process and audience analysis. Students will write a variety of documents selected from the following list: proposals, feasibility report, technical brief, lab report, manual, letter of application and resume, technical description, progress report, and research report. (3-0-3) Prerequisite: EN 1713 English Composition I

SH 1312 Public Speaking

Public Speaking teaches the student how to present information persuasively and enjoyably to an audience through the oral medium. The student will plan and give informative, expressive, entertaining, and persuasive reports. (2-0-2) Prerequisite: None

SH 1313 Fundamentals of Speech

This course is a study of the basic concepts of speech communication and listening as applied to Public Speaking. Students will learn principles and practice message preparation, audience analysis, presentation skills and speech criticism. Each student will plan and extemporaneously give informative, persuasive, expressive and entertaining presentations. Designed primarily for students who plan to transfer into a four year program. (3-0-3) Prerequisite: None

BUSINESS/ACCOUNTING/ECONOMICS

BU 1413 Supervisory Management

An analysis of the responsibilities of the supervisor, with an examination of the skills and practices helpful in developing effective relations with people in a work setting. Topics studied include employee motivation, leadership, communication, group dynamics, management functions, employee selection, training and appraisal, handling discipline and resistance to change, and methods of improving productivity. The course generally takes the viewpoint of the supervisor, yet should also promote insights valuable to students dealing with their own supervisors and peers. (3-0-3) Prerequisite: None

BU 1422 Capital Investment Analysis

An introduction to the tools of economic and financial analysis of business expenditures. This includes developing an awareness of interest computation, time-value or money concepts, depreciation, taxes, and methods of evaluating proposals under the conditions of certainty and risk. (2-0-2) Prerequisite: MA 1213 College Algebra

BU 1423 Introduction to Business

This course surveys the objectives, decisions, and activities within the business organization. Topics include a study of management responsibilities and controls, organizational structures, marketing activities, production operation decisions, finance and accounting, human resources administration, and business law. Methods of instruction include lecture, discussion and a microcomputer based interactive simulation of hypothetical business comprised of student teams. (3-0-3) Prerequisite: None

BU 1443 Business Law

This course introduces the student to the rules of common law under which the business world operates as well as the basic understanding of the legal rights and duties arising from common business transactions. Also, this course introduces the student to legal terminology, principles, and analysis. Topics covered include contracts, personal property, real property, insurance, estates, and agency. (3-0-3) Prerequisite: None

BU 1622 Accounting Applications for Microcomputers

The primary objective of the text and supplementary materials is to focus the teaching of fundamental accounting principles and the use of a computerized accounting system in the laboratory. (1-1-2) Prerequisite: BU 1513 Financial Accounting

BU 2433 Marketing

Study of coordination and control of marketing activities in relation to management and society. Applied economics, psychology, and sociology found in market segmentation and research, and in strategic and tactical management of product development and pricing, promotion and distribution. (3-0-3) Prerequisite: EC 1413 Economics

AC 1513 Financial Accounting

Study of business topics such as alternative forms of business organization; typically business practices; legal instruments such as notes, bonds, and stocks; and financial statements and analysis. The main objective is to provide information to stockholders, creditors, and others who are outside an organization. (3-0-3) Prerequisite: Concurrent with MA 1213 College Algebra

AC 1523 Managerial Accounting

Study of the uses of accounting data internally by managers in directing the affairs of business and nonbusiness organizations. Costing, segmental reporting, controlling activities, budgeting, and decisions are topics covered. The main objective is to provide information to managers and others who are within the organization. (3-0-3) Prerequisite: AC 1513 Financial Accounting

EC 1413 Economics

A survey course of micro and macro economic topics including decision making, demand and supply concepts, markets and competition, gross national product and its components, money and banking, and government's role in business. (3-0-3) Prerequisite: Concurrent with MA 1213 College Algebra

SOCIAL SCIENCE

PY 1113 Psychology

Study of psychological principles and developments to improve understanding of interpersonal relations, motivation, feelings, perceptions, learnings, and emotions for increased personal efficiency and effectiveness of performance in whatever activities are carried out. (3-0-3) Prerequisite: None

HI 1312 History of Technology

This course presents an overview of the development of technology from ancient times to the modern complex of our technological society. Emphasis is placed on the technology explosion of the twentieth century including the interrelationship between the various branches. Perspectives on the impact of technology on the quality of life will be explored. Methods of instruction include the lecture, discussion and library assignments including the preparation of short reports by the student. (2-0-2) Prerequisite: None

SO 1113 Introduction to Sociology

This course surveys the historical development of human society and the related evolving social structure each development produced, and the resultant effect each development and structure has on the functioning of people in collectives. (3-0-3) Prerequisite: None

CONTINUING EDUCATION COURSES

(Adult Program)

Unique and timely courses of special interest to individuals, business and industry are offered on a regular basis. While these courses are not required by a specific curriculum they carry the same high quality and Kansas Tech touch as those offered through major departments.

Continuing Education Course Descriptions

AP 1341 Wordstar 2000

An introduction to the uses, applications and commands of Wordstar 2000 word processing software. Each enrollee will have a one-to-one use of a microcomputer throughout the course. Enrollment per section is limited. No previous computer knowledge is required. (1-0-1) Prerequisite: None

AP 1351 LOTUS 1-2-3

The LOTUS 1-2-3 software program combines spreadsheet analysis, information management and graphics in a simple program. By the end of this course, the participant will be able to construct, edit, store and print simple accounting type spreadsheets, and be able to use the database and the graphics of the LOTUS 1-2-3 program. (1-0-1) Prerequisite: Some knowledge of microcomputers.

AP 1361 Review of Software

This course is designed to familiarize the student with commercial software for microcomputers. The student will be given "hands-on" exposure of typical applications on software packages to include word processors, electronic spreadsheets and integrated software packages. Software to be examined includes Wordstar, Multiplan, Wordpro, LOTUS 1-2-3, Symphony, dBASE and etc. (1-0-1) Prerequisite: None.

AP 1381 Wordperfect

In this class you will learn the fundamentals of word processing using WordPerfect version 4.2. Topics included are editing, block moves, and enhancement techniques such as bold, underline, and centering. The student will also learn how to use the built-in dictionary, the thesaurus, and how to use the features for creating newsletters or scripts. (1-0-1) Prerequisite: None

AP 1391 dBASE III Plus

An introduction to a database management program. Use, application, and commands will be covered in a hands-on setting. (1-0-1) Prerequisite: Some knowledge of microcomputers helpful.

AP 1422 Computer-Numerical-Controlled Machine Processes

This course is designed to give students exposure to basic CNC programming and machining operations. There are no prerequisites to this course although a background in fundamental metal machining processes as well as algebra and right angle trigonometry would be helpful. (0-2-2) Prerequisites: None

AP 1432 Computer-Aided Drafting

Applications and understanding of microcomputers in technical drafting and design. Topics include generative graphics hardware and software terminology, point plotting and line drafting, graphics, programming, geometric figures, dimensioning and annotating, and finished drawings. (0-2-2) Prerequisite: Knowledge of drafting

AP 1451 Intermediate LOTUS 1-2-3

This advanced course will focus on the built-in functions of LOTUS 1-2-3, writing and programming macros, graphing techniques, merging documents and files, database components, and other important advanced functions. (1-0-1) Prerequisite: AP 1351-LOTUS 1-2-3 or prior experience with LOTUS 1-2-3, instructor's consent.

AP 1512 First-Line Management

This course is for supervisors who have had little or no previous supervisory training. It is designed to enhance one's managerial abilities and promotional possibilities. The class focuses on developing an understanding of the supervisor's insights into directing the work of others and coping with problem situations. (2-0-2) Prerequisite: None

AP 1526 Emergency Medical Technician

Successful completion of this course will enable the student to take the state certifying examination for license. Specifically, this course will enable the Emergency Medical Technician to: 1) recognize medical emergencies and make an appropriate diagnosis, 2) perform a primary and secondary examination, 3) proficiently stabilize an airway and the use of adjunctive equipment, 4) understand and anticipate potentially life-threatening emergencies and institute appropriate therapy, 5) file a standardized State Run of Occurrences Form for the use of the receiving hospital as well as permanent records for state and local use, and 6) communicate effectively, using radio communications from the ambulance to the receiving hospital in an orderly and proficient manner. (6-0-6) Prerequisite: None

AP 1812 Basic Astronomy

Selected topics from basic astronomy will be discussed to encourage a general interest and basic knowledge. Will include field work, as well as the study and use of telescopes. Topics include the earth/moon system, solar system, our galaxy, external galaxies, nebulae, meteors, comets, and interstellar matter and movements. (2-0-2) Prerequisites: None

AP 1901 Basic 35mm Photography

This course is designed for those who wish to advance beyond the "snapshot" stage of photography. Topics include camera types and care, lens types and use, film characteristics and use, composition, indoor and outdoor lighting, filters, close-ups, and macros. (1-0-1) Prerequisite: None



BOARD OF CONTROL

The governing board of the College is the Kansas State Board of Regents. It consists of nine members appointed by the Governor. The board elects its own chairman. The President of Kansas College of Technology, who is charged by statute with the general management of the College, is appointed by the Board of Regents.

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INDEX

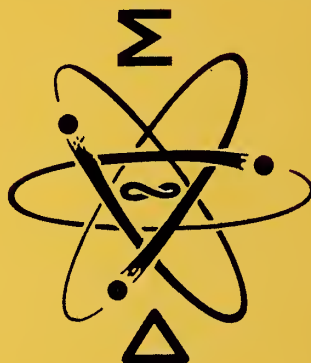
	PAGE		
Academic Advising	11	General Information	5
Academic Calendar	4	Grading System	12
Academic Departments	18	Graduation Requirements	15
Academic Probation, Dismissal	14	Graduation with Honors	15
Accreditation and Certification	18	Health Service	10
Administration	50	History of the College	3
Admission as an International Student	6	Honor Roll, Dean's	13
Admission Testing	6	Honor Roll, President's	13
Admission as a Transfer Student	5	Housing	9
Admission as a Veteran	5	How to Apply for Admission	5
Aeronautics Division	20	Industrial Engineering Technology	39
Aviation Maintenance	21	Course Descriptions	39
Course Descriptions	23	International Student Admissions	6
Helicopter Maintenance	22	Kansas Career Work-Study	7
Professional Pilot	20	Length of Academic Programs	11
Application for Graduation	14	Library Services	15
Auditing Courses	12	Load, Student	11
Automated Manufacturing Option	44	Mathematics Transition Program	18
Board of Control	50	Mechanical Engineering Technology	42
Bookstore	10	Course Descriptions	43
Campus Map	16-17	Mission of the College	3
Career Services	8	Objectives of the College Education	4
Chemical Engineering Technology	40	Out-of-State Applicants	6
Course Descriptions	41	Pell Grants	7
Civil Engineering Technology	26	President's Honor Roll	13
Course Descriptions	28	Pre-Enrollment	12
Construction Option	27	Probation	14
Class Attendance	12	Program Options	18
College Technical Education	4	Reinstatement	14
Computer Engineering Technology	36	Repetition of Courses	14
Computer Information Systems	31	Requirements for Degree	19
Computer Science Technology	30	Scheduling of Classes	11
Course Descriptions	32	Scholarship, Sponsorships	8
Continuing Education	16	SEOG	7
Continuing Education Courses	48	Semester Credits	11
Course Identification Key	19	Servicemen's Opportunity College	6
Credit by Qualifying Examination	13	Student Housing	9
Directory Information	14	Student Life	10
Electronic Engineering Technology	35	Student Services	6
Electronic Course Descriptions	37	Student Union	10
Eligibility for Resident Fees	6	Surveying Technology	27
English Proficiency Program	18	Table of Contents	2
Examinations	12	Technical College Graduate	4
Fees and Refunds	14	Transcript	14
Fee Refund Schedule	14	Transfer Student, Admission of	5
Financial Aid	7	Veterans, Admission of	5
Food Service	10	Veterans Affairs	8
Freshman/Sophomore Standing	11	Welcome from the President	1
Full-time Status	11	Withdrawal from Class	13
General Education Requirements	44	Work-Study Program	7
General Education Course Descriptions	44		

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