CATALOG 81-82

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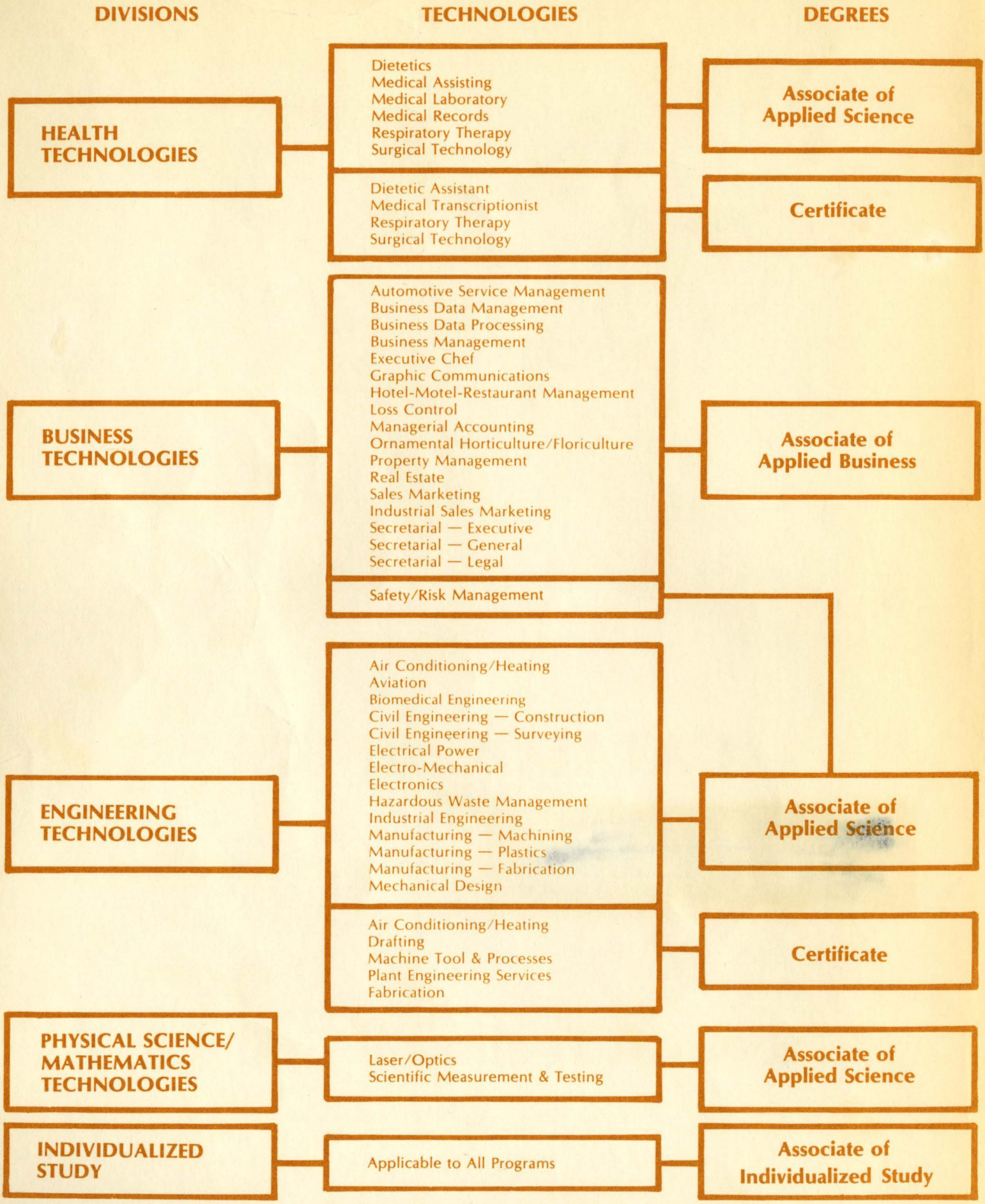
Cincinnati Technical College


DIVISIONS
TECHNOLOGIES
DEGREES
HEALTH TECHNOLOGIES
Dietetics
Medical Assisting
Medical Laboratory
Medical Records
Respiratory Therapy
Surgical Technology
Associate of Applied Science
Dietetic Assistant
Medical Transcriptionist
Respiratory Therapy
Surgical Technology
Certificate
BUSINESS TECHNOLOGIES
Automotive Service Management
Business Data Management
Business Data Processing
Business Management
Executive Chef
Graphic Communications
Hotel-Motel-Restaurant Management
Loss Control
Managerial Accounting
Ornamental Horticulture/Floriculture
Property Management
Real Estate
Sales Marketing
Industrial Sales Marketing
Secretarial — Executive
Secretarial — General
Secretarial — Legal
Associate of Applied Business
Safety/Risk Management
ENGINEERING TECHNOLOGIES
Air Conditioning/Heating
Aviation
Biomedical Engineering
Civil Engineering — Construction
Civil Engineering — Surveying
Electrical Power
Electro-Mechanical
Electronics
Hazardous Waste Management
Industrial Engineering
Manufacturing — Machining
Manufacturing — Plastics
Manufacturing — Fabrication
Mechanical Design
Associate of Applied Science
Air Conditioning/Heating
Drafting
Machine Tool & Processes
Plant Engineering Services
Fabrication
Certificate
PHYSICAL SCIENCE/ MATHEMATICS TECHNOLOGIES
Laser/Optics
Scientific Measurement & Testing
Associate of Applied Science
INDIVIDUALIZED STUDY
Applicable to All Programs
Associate of Individualized Study

ACADEMIC POLICIES & PROCEDURES

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ACADEMIC POLICIES & PROCEDURES

CATALOG 81-82

1981-1982
Cincinnati Technical College
Catalog

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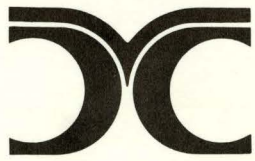
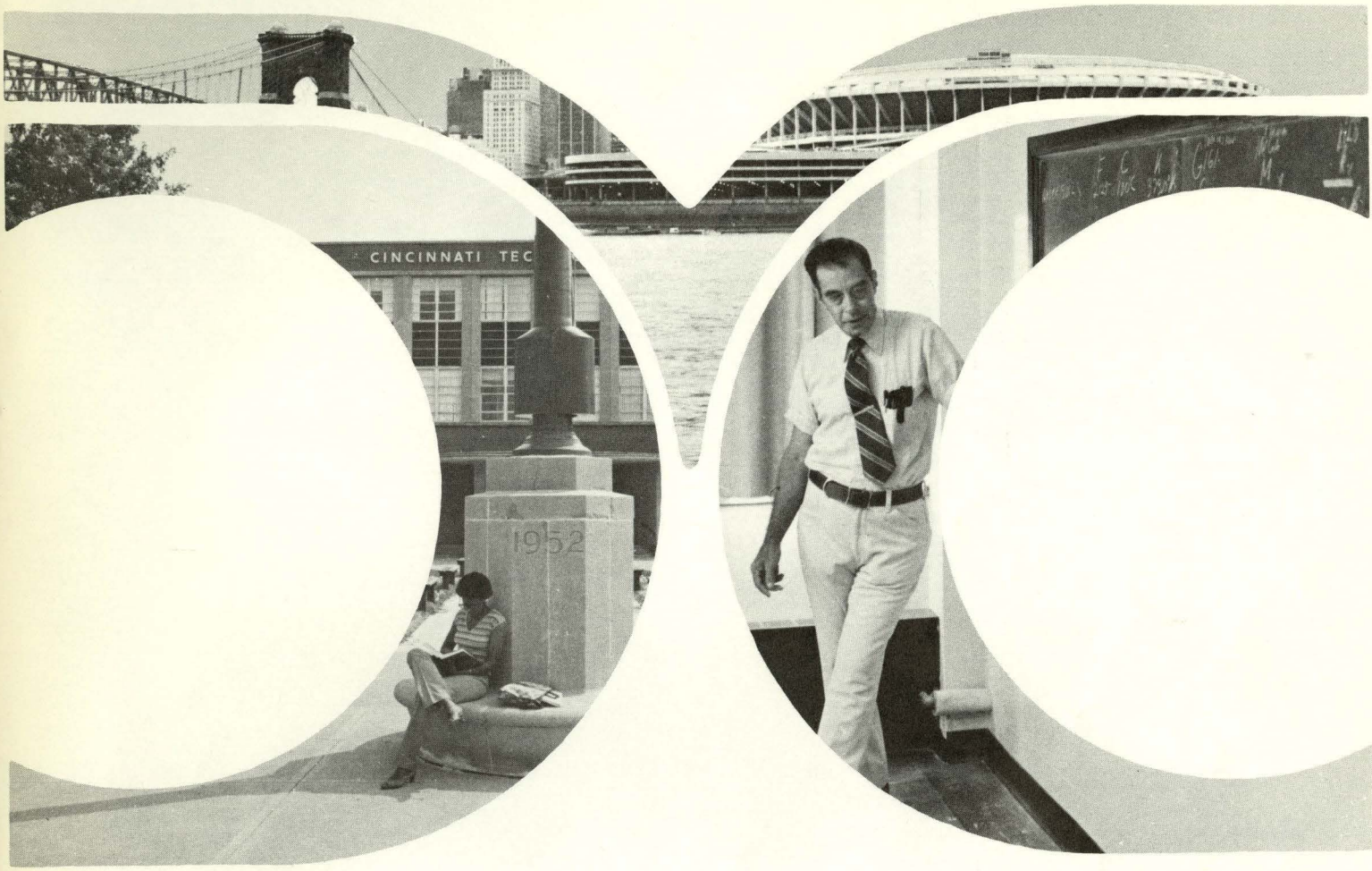


Cincinnati Technical College
3520 Central Parkway
Cincinnati, Ohio 45223
(513) 559-1520



GENERAL INFORMATION

CATALOG 81-82

GENERAL INFORMATION

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Mission of the Cincinnati Technical College

The Cincinnati Technical College has a vital and distinctive mission to perform in addressing the educational and economic needs of the Tri-State area.

The mission of the College is to teach the application of knowledge and skills useful to technicians and to prepare students who have technical occupational interests and aptitudes for immediate employment and potential advancement, to provide non-technical educational experiences and activities which will prepare students to function as effective members of our society, and to encourage students who have the desire to continue their education beyond the academic level of this College to do so.

Why the Need for Technical Education Has Arisen

A scientific revolution, underway the last several decades, has quickened the pace of change in all of the professions and transformed the occupational role and the educational requirements of the professionally trained employee. In the past, the professional, the product of four or more years of college, had the time, the training and the duty to perform many practical functions in work. An engineer, for example, might spend hours drawing or routinely testing a new product. New scientific discoveries and technological advances have so enlarged the body of theoretical knowledge underlying many of the professions that now there is too little precious time in the professional curricula to develop practical skills. The mastery of theory has become the first priority of the professional. The use of this theoretical knowledge has become the dominant function of the professional in day-to-day work.

As a consequence, the professional needs the assistance of a new member of the employment team, the technician or semi-professional. And, to prepare this semi-professional to work with the scientist, or the engineer or the medical specialist, the technician requires a new type of college education.

The technician must master, to some extent, the theoretical principles relating to a specialized technology and develop the practical abilities the specialty requires. Such educational preparation is above the high school level, but does not require the four or more years of college needed by the professional. An intensive program, usually of two years duration and designed to prepare the student for immediate and effective employment upon graduation, suffices. Such a program is technical education.

The need for technicians, already great, is growing rapidly. The increase in technical jobs over the next decade will exceed that of most other employment categories according to federal projections.

How Technical Colleges Differ from Other Types of Institutions of Higher Education

Technicians are action people. They must be trained to apply theory in support of the professionals with whom they work. Their education therefore differs markedly from that of the professionals.

Technicians need some theoretical preparation, but not in the breadth and depth required of the professional. As a consequence, the technical education curriculum must be practical in nature. The first two years of college prepare the professional-to-be for more advanced college work. In the two-year education program, the technician must learn all that he or she needs to know in order to be employable. The curricula needed by the two are in sharp contrast: the professional is academic and theoretical; the technical is practical and action-oriented. In the first two college years, the professional level student learns how to learn more; the technical education student learns how to do well those things which must be done on the job.

Technical education, to be effective, requires a special educational environment: a faculty dedicated to practical education; laboratory equipment adequate to make such education possible; a governing body and administration dedicated to the philosophy of this education; a close working relationship with business and industry. The technical college provides that special environment.

Ohio has a network of sixteen technical colleges, all created in the last twenty years or so as a result of federal, state and local initiatives. The National Defense Education Acts of 1958 and 1963 and the Vocational Education Acts of 1963 and 1968 helped to provide a stimulus to these and hundreds of other technical schools throughout the nation. Passage of these acts and state statutes creating technical colleges have underscored the high priority of these institutions. The orderly growth of the nation's economy depends in large measure on the quantity and quality of the supply of technicians.

The Special Needs Served by Cincinnati Technical College's "Co-opportunity" Plan

The Boards of Trustees, the administrative staff and the faculty of the Cincinnati Technical College share a profound conviction that the school's distinctive plan of cooperative education offers the soundest possible approach to technical education. The objective of any associate degree program in technical education is to prepare the student for immediate employment and potential advancement as a technician. The student must learn both the "why" and the "how." Rigorous, college-level academic instruction is necessary; it is not, however, sufficient. The student's understanding of theory and the ability to apply it are fortified with periodic practice. The classroom can provide valuable laboratory experience but it cannot duplicate an employment environment. Because many Cincinnati Technical College students spend every other term in supervised cooperative employment they are exposed to such an environment at regular intervals. The practical training received in such employment enriches the academic experience.

Certainly if the technician manpower needs of the area — already great and rapidly growing — are to be served, more high school graduates must be attracted to technical education. Yet limited family finances are a major reason why so many do not further their education after high school. Clearly, in the Cincinnati area, thousands who graduate from high school each year have the ability to complete successfully a two-year college-level technical education but do not because they cannot afford either the income forgone while in school two years or the direct expenses incurred (tuition, books, etc.) or both.

Yet few of these graduates are likely to be given effective on-the-job technician training because relatively few plants in the area can afford training programs.

The cooperative education program of the Cincinnati Technical College meets both these needs. The College therefore is now serving hundreds of students who cannot afford to attend other institutions in the area. In addition, the cooperative education plan also enables many small firms to have technician training programs of a quality they could not otherwise have. The Cincinnati Technical College has a vital and distinctive role to play in the area, contributing to both the educational and the economic welfare of the community.

The College is offering 42 associate degree programs and options and eight certificate programs in 1981-82. Each program was developed to meet a specific need for technicians

in local industry demonstrated by a formal or informal feasibility study and supported by the counsel of an advisory committee representing the potential employers of such technicians. No co-op program can be started if it does not address itself to real employment needs of industry and to the real educational interests and aptitudes of local citizens. Each program requires training positions and students qualified to prepare to fill them.

The College will continue to develop programs through the feasibility study-advisory committee approach. In this manner it necessarily must be attuned to the educational needs of the students it serves and the employment needs of the companies with whom it cooperates.

History of Cincinnati Technical College

Because a great and growing shortage of technicians existed in the area, the Cincinnati Board of Education established the Cincinnati Cooperative School of Technology, a two-year institute for high school graduates, in 1966. The function of the school was to train technicians in a program combining college-level classroom instruction and cooperative work experience.

Since all technical education programs in Ohio were to come under the authority of the Board of Regents, the Cincinnati Board of Education proposed in April, 1969 that the Regents establish a Cincinnati Technical Institute District and approve CCST as the nucleus of the technical institute to serve that district. These proposals were approved by the Regents in May, 1969.

The Board of Trustees of the new district — two appointed by the Governor and five elected by the Cincinnati Board of Education — held their organizational meeting on September 15, 1969. At that meeting they appointed the President of the Institute, and approved the Institute operating plan and associate degree programs. They also changed the name of the school to Cincinnati Technical Institute, to conform with the designations of other institutes in the state.

The Board of Regents approved the degree programs and the operating plan on September 19, 1969 and issued the Cincinnati Technical Institute charter on that date.

December 31, 1969 was the final day of operation under the governance of the Cincinnati Board of Education. On the first day of the new decade, the Institute became an autonomous institution.

In June, 1970, the Board of Trustees of the Institute entered into a contract with the Cincinnati Board of Education to purchase the Courter Technical High School property, where the College is located, for $8.4 million.

The Trustees acquired title to the property in November, 1970, when they made the first payment of $3.6 million. Additional payments were made annually as the Institute moved into additional rooms and the high school operation was being phased out.

In 1972 the name of the Institute was changed to Cincinnati Technical College, in accordance with a state statute passed by the Ohio General Assembly in the fall of 1971.

On June 27, 1974, the phase out of the high school was completed and the College made the final payment of $2.7 million to the Cincinnati Public Schools.

In its fifteen years CTC has experienced tremendous growth. The first year, 1966-67, saw an enrollment of 115 students in four degree programs, a seven member staff and 37 co-op employers. This past year it enrolled 3900 students in 50 degree and certificate programs and options; has a staff of 220 plus 100 part-time instructors; and has 500 co-op employers.

Accreditations & Memberships

Ohio Board of Regents
Division of Vocational Education, State Department of Education
North Central Association of Colleges and Secondary Schools
Ohio College Association
Ohio Technical and Community College Association
FAA — Approved Aircraft Maintenance Technician School
Member of the American Society of Allied Health Professions
Member of Ohio Organization of Technical Colleges
Member of Cooperative Education Association
Member of American Technical Education Association
Member of American Association of Junior Colleges
Member of National Junior College Athletic Association

Cincinnati Technical College's Unique Co-op Plan

How It Works — From the Student's Viewpoint

The Applicant Takes the Admission Test. In the admissions process, the applicant takes the entrance test, the Differential Aptitude Test of the Psychological Corporation. The applicant also usually specifies the program in which admission is sought.

The Coordinator Interviews the Applicant. After the test has been scored and after the College has received the high school transcript, the applicant is interviewed by the coordinator of the program to which admission is sought. The coordinator assesses the applicant's chances of success in the classroom and on the co-op job on the basis of the applicant's aptitude and interests as measured by test scores, high school academic record and the interview. The coordinator either (a) accepts the applicant into the program; (b) accepts the applicant on condition, if the applicant needs additional preparation to succeed in the program; (c) advises the applicant, if there appears to be little chance of success, to enroll in another of the programs at the College more congenial to the applicant's interests and aptitudes, and refers the applicant to the coordinator of that program or the Admissions and Counseling Office.

The Student is Assigned to Either the "A" or the "B" Section. If the student is assigned to the "A" section of students, the student will spend the first quarter in school and the second on co-op. If assigned to the "B" section, the student will co-op the first quarter and spend the next in college. Whether on the "A" or "B" schedule, the student will repeat the two-quarter cycle five times until completion of the program. Ornamental Horticulture and Aviation Technology students, however, follow different schedules as explained elsewhere in the catalog.

The coordinator will attempt to help the student secure a co-op job, often times in the summer before the academic year begins. The coordinator will arrange for the student to be interviewed by an employer; the employer will make the decision to hire or not to hire.

The Student Graduates with Considerable Career Assets. Each Cincinnati Technical College graduate begins a career as a technician with these credentials: an associate degree in a technical specialty with as much as fifty percent more classroom contact hours than are provided in some two-year degree programs at other colleges; up to a full year of work experience; a level of intellectual and emotional maturity which only the co-op program could provide. Some graduates pursue a baccalaureate degree full-time. Others work toward the four-year degree by taking university courses in the evening.

Co-ops pay taxes of various kinds (state sales and city, state and federal income) on their earnings and by so doing, while they are receiving their education, help repay the tax money invested in their education.

Outcomes of Cincinnati Technical College's Co-op Plan

Cincinnati Technical College, with regard to its mission and philosophy, has developed a co-op education plan of combining solid academic and technical education with alternating terms of work experience. The following are the outcomes of the plan as they affect the student, the College and the community.

Outcomes for the Student

(1) Financial — Most full-time students are able to earn money while gaining work experience. These co-op earnings enable many students to help finance their education. Also, the work experience the students receive offers the opportunity for better positions and better pay upon graduation.

(2) Educational — Students support what they learn in class with "real life" work experience. These two learning situations complement each other.

(3) Career clarification — The technical classwork and on-the-job experience help the students focus on particular career areas and decide if those areas are appropriate for them.

(4) Social and emotional — Students develop maturity by experiencing a responsible position in the real world with support and guidance to insure that learning takes place.

Outcomes for the College

(1) Comprehension of employment needs — The efforts by the College to establish co-op jobs and place graduates have enabled the College to be more sensitive to the needs of the area.

(2) Utilization of the physical plant — The alternating work experience terms enable the College to double its student capacity and make more efficient year-round use of the physical plant.

(3) Employment involvement — Employers actually become directly involved in the educational process of the College through the co-op plan. They also share in the cost of education by providing on-the-job training.

(4) Faculty awareness — Faculty stay current on activities in their field through contact with industry.

Outcomes for the Community

(1) Supply of technicians — The College's programs create a needed supply of trained, experienced technicians for the employment community. This factor makes the area attractive for business development.

(2) Economic gain — Increased earning potential of the graduates benefits the community in terms of productivity, taxes paid and contributions made.

(3) Citizen productivity — Graduates enter the workforce with well-clarified career goals and experience which enable them to be more productive and motivated workers.

(4) Industrial staffing — Employers have the opportunity to train and observe co-op students and to evaluate their suitability for full-time employment before they make the commitment to hire full-time.

Starting Salaries for Graduates

Average starting salaries for graduates in each technology are available from the coordinator or can be found in the Admissions Office.

Continuing Education and Extended Services

As more students with greater diversity of needs enroll, the College has developed different and improved ways of serving those needs. The recent trends being experienced may be categorized in the following way:

Changes in Academic Needs

There has been a large increase in the number of students who have already started a career and wish to develop it further through more education. Typically, these students are employed but are seeking to develop their careers to a higher level in the most efficient manner. Many students also feel a need to update their technical education and possibly attempt different career directions without interruption to their current employment.

CTC can respond to the business-industrial-professional communities' requests to provide off-campus courses to upgrade employee skills. In addition, the College works with professional and technical societies, organizations and trade unions to offer short-term and long-term programs for their members.

Change in Scheduling

Since there is an increase in the number of students who are employed full-time, the College has increased the evening offerings so that different career aspirations can be pursued while the students continue to work during regular daytime hours.

Cincinnati Technical College offers the following associate degree programs through the main campus evening program:

Business Technologies Division
business data management
business data processing
business management
loss control
managerial accounting
real estate/property management
safety risk management
sales marketing
industrial sales marketing
secretarial

Engineering Technologies Division
electronics engineering technology
electro-mechanical engineering technology
electrical power technology
heating/air conditioning technology
industrial engineering technology
manufacturing engineering technology
mechanical design technology

Health Technologies Division
medical record technology

Physical Science/Mathematics Division
measurement and testing (technical laboratory)

The College also offers certificate programs through its evening operation: dietetic assisting, drafting, heating/air conditioning technology, machine tool processes, medical transcription, plant electrical maintenance, plant engineering maintenance and fabrication.

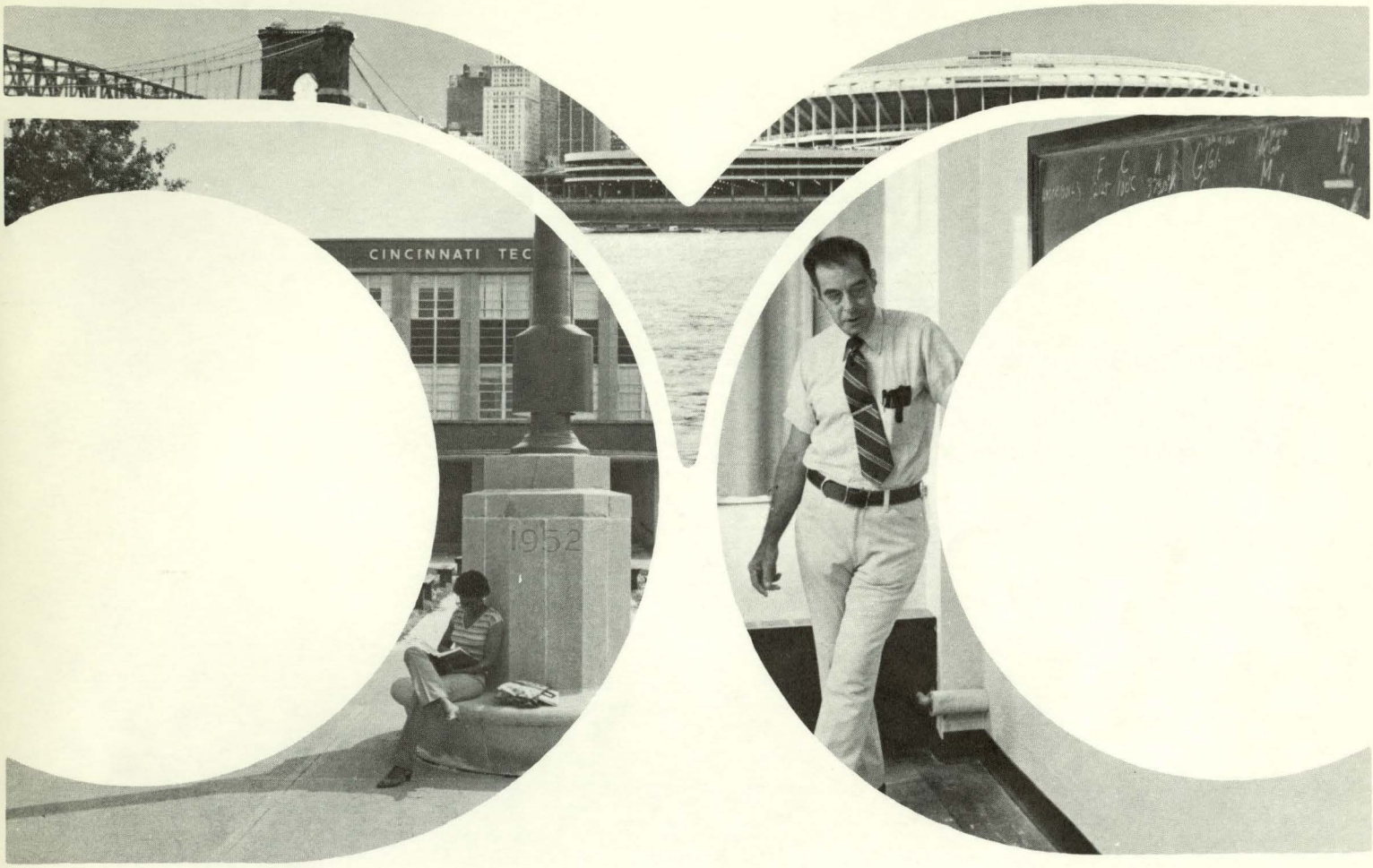
To pursue a degree program at night, the student should apply for admissions and meet the admissions criteria for that program.

Change in Locational Needs

The trend toward more students who are working full-time also means that these students have generally more compacted daily schedules. Travel time and the energy expense of going to and coming from classes are becoming greater concerns. More students need classes located closer to their residences or to their places of employment.

Cincinnati Technical College has addressed these student needs by increasing its degree and certificate program offerings in the evening and in convenient locations. Cincinnati Technical College provides concurrent course offerings through its extension centers located within the College service area. CTC extension centers are located at Anderson High School, Colerain Vocational Center, Elder High School, Northwest Vocational Center and Oak Hills High School.

The continuing education operations also include recreational and leisure-time courses offered for the more casual interests of students.



ADMISSIONS, FEES & FINANCIAL AID

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Admissions Information

General Admission Requirements

Applicants must meet the following qualifications:

1. Submit a transcript of credits earned in high school.
2. Achieve satisfactory scores on entrance examinations.
3. Possess physical qualifications to perform acceptably in the field of training selected.
4. Interview with the coordinator of the selected program.
5. Complete necessary high school courses needed as a prerequisite(s) for the desired program.

Application for Admission

Apply early! Each year some programs are filled by early spring. (Applicants for these filled programs may be placed on a waiting list.)

To apply, follow these steps carefully:

1. Obtain an application from your high school counselor or by writing or calling the Admissions Office.
2. Complete the application form and submit it to the Admissions Office with the twenty dollar ($20) application fee. This fee partially covers the cost of administering the entrance test, counseling, processing and registering the accepted student. It is **not** refundable.
3. Have a copy of your high school transcript sent to the Cincinnati Technical College. This should be done as soon as you have decided to apply for admission.
4. Take the entrance examination, the Differential Aptitude Test (DAT), on the earliest possible date. No final action can be taken on your application until the examination has been taken (or waived by the program coordinator). The dates on which the examination will be administered are listed on this page.
5. If you have attended another college or university, a transcript of credits must be submitted before the interview so that transferability of course credits can be determined at that time.
6. At the time you receive your test scores or as soon as your admissions file is complete you will be notified to call the Admissions Office to make an appointment for an admissions interview with the coordinator of the program you selected. You will receive a decision regarding acceptance at the time of the interview.

Student Deposit

A deposit of thirty dollars ($30) is payable when an applicant receives notice of tentative acceptance. Payment of the deposit when due assures the applicant of a place in the program and is considered as evidence of good faith that the student will register.

The student deposit will not be refunded if the applicant decides not to enter Cincinnati Technical College.

Credit for the fee deposit may be extended for 1) twelve months when an applicant fails to register due to illness or other causes entirely beyond the applicant's control or 2) the period of active duty when an applicant enlists in military service.

Application for credit must be made in writing at the time of the admission cancellation. Proof of any extenuating circumstances may be required. The Vice President for Finance and Business Affairs is authorized to make decisions on these matters in accordance with school regulations.

Advanced Standing

A student desiring advanced standing by transfer of credits from other colleges must request any colleges previously attended to forward directly to the Registrar a transcript of academic record. Courses paralleling Cincinnati Technical College courses in which a student has achieved a grade of "C" or better will be considered for credit.

Foreign Students

Foreign applicants must follow the prescribed application procedures as set forth on this page. In addition they must submit TOEFL examination results.

A Declaration and Certification of Finances shall be supplied to the College before a Certificate of Eligibility (Form I-20 or DSP-66) will be authorized. Therefore all foreign students should contact the Director of Counseling Services as soon as possible in order to facilitate enrollment.

Entrance Test

All applicants for admission to the Cincinnati Technical College must satisfy the entrance examination requirement before any final decision on acceptance can be made.

The exam will be administered at the Cincinnati Technical College on the dates listed below. The test takes about 3½ hours.

Applicants are urged to take the exam on the earliest date possible and to submit all other necessary forms since many programs are filled by early spring.

Applicants living outside of the Greater Cincinnati area, who cannot arrange to take the exam in Cincinnati, should write the Admissions Office as early as possible so special arrangements might be made through the applicant's high school or educational officer if the applicant is in military service.

At the discretion of the program coordinator, SAT or ACT scores, previous college or work experience may be substituted to satisfy the entrance test requirement. Contact the coordinator of the program for which admission is sought to see if a test waiver is possible.

Entrance Test Dates

September 19, 1981	February 27, 1982
October 17, 1981	March 13 1982
November 21, 1981	April 17, 1982
December 12, 1981	May 1, 1982
February 6, 1982	May 22, 1982

All regularly scheduled tests are held on the Saturday mornings listed above. The tests will begin **promptly** at 8:00 a.m. Applicants should make arrangements to be present by 7:45 a.m.

Because of weather conditions, these dates are subject to change. Please confirm the test date with the Admissions Office, 599-1520.

Financial Information

Student Expenses

The Ohio Board of Regents provides a student subsidy to the Cincinnati Technical College for each Ohio resident enrolled. The amount received from the Regents equals about one-half of the College's operating costs. An additional nine percent is provided by the State Department of Education, Division of Vocational Education. The balance must come from tuition payments and other sources. Out-of-state residents pay the highest amount of tuition since the College receives no Regent's subsidy for their instruction. (See page 14 for complete explanation of residency determination.)

Fees and Charges

Resident Status[1]	Instructional Fee		General Fee[2]		Cost per Credit Hour
State of Ohio Resident	$19	+	$3	=	$22
Out-of-State Resident	$29	+	$3	=	$32

Fees are non-refundable other than the Instructional Fee.

Other Charges:

Application Fee	$20
Matriculation Fee	$30
*Credit By Examination Fee (prior to enrollment in course)	$25
Graduation Cap, Gown, Invitations	Purchased in Bookstore
Late Registration: (1st day after scheduled registration)	$10
(2nd day after scheduled registration)	$20
(3rd day after scheduled registration)	$30
Partial Payment of Fees	$10
Transcript Fee	$ 1
Vehicle Registration Fee, per term, lower lot	$ 7
Campus Parking Permit Fee, per term	$25
Check Fee (checks returned by the bank)	$10
Part-time Registration	$ 5
Identification Card	$ 1
Laboratory Fees on a per course basis	

*If a student has already enrolled in a course and wishes to take a proficiency exam to receive credit, the student must submit a request form to the appropriate division dean. The tuition payment will cover the cost of the examination. However, if a student fails the exam and must continue in the course, a $5 fee will be charged.

Fees are subject to change.

[1] Please refer to page 13 of the College catalog.
[2] The General Fee finances non-instructional services to students for which instructional subsidies cannot be used.

Co-op Employment

Two (2) credit hours for approved cooperative work experience are granted for terms 1 and 2, and three (3) credit hours for terms 3, 4 and 5 in most technologies. Please refer to the specific curriculum to determine exact co-op credits required. Charges for co-op credit must be paid in advance on the established registration date.

Books and Supplies

The cost of books and supplies can vary greatly from term to term. Also, different programs have different requirements. Students in the engineering technologies, for example, generally will spend more on supplies and equipment than the business oriented programs.

The first school term usually is the most expensive one as students purchase books and supplies at that time that they also use in later terms. The average range of expenses for books and supplies is $250 per year.

Refunds

1. Fees are not refundable including the $30 matriculation fee. A refund of basic tuition may be requested by any student who withdraws from the College according to the schedule detailed below.
2. Requests for refunds will only be considered if the student completes and signs the official college student transaction form in conjunction with the coordinator of that student's technology.
3. **Students who do not follow the established withdrawal procedures of the College will not be eligible for a refund.**
4. Withdrawal of a student who has been permitted to make only a partial payment at registration will be handled precisely as it would have been had complete payment been made.
5. If a student has a financial obligation or balance due the College and leaves without following the established withdrawal procedure, the entire balance is due immediately and no refund or credit is possible.
6. The official date of total withdrawal is the date recorded on the student transaction form when it is signed by the student and coordinator. Tuition refunds for total withdrawal, when allowed, are made on basic tuition only at the following rates:

During the first week of the term	80%
Second week	60%
Third week	40%
Fourth week	20%

7. If a student drops a course during the first or second week of the academic term and signs a course withdrawal form, the student will be entitled to an 80% refund of the instructional fee for that course in the first week and 60% of the instructional fee in the second week. Students must process an Add/Drop transaction form.

The Cincinnati Technical College reserves the right to revise this statement of tuition refunds at any time.

Student Bookstore

The bookstore is located on the first floor of Wing C. A complete supply of new texts and a limited supply of used books are available covering all the courses offered at the College. The store also carries a complete line of classroom supplies, calculators, various tools used in labs, etc.

Used books are purchased by the bookstore during the two week period prior to the start of each new academic term.

Books for which an exchange or refund is requested must be accompanied by the original receipt and presented to the College bookstore within one week after the beginning day of each term. If a student drops a course and wishes a refund within the established time frame, the student must show the bookstore personnel a copy of the drop/add form. Only books on approved technology booklists can be returned as used books and refunded accordingly.

Regular hours of the Bookstore are 9:30 a.m. to 6:30 p.m. Monday through Thursday. On occasion hours are extended as follows:

During registration: 9:00 a.m. to 8:30 p.m.
First week of a term: 8:00 a.m. to 8:30 p.m.
Second week of a term: 9:30 a.m. to 7:30 p.m.

Note: Bookstore hours on all Fridays are 9:30 a.m. to 4:00 p.m.

Student Parking

CTC provides on campus parking for students on a first come, first served basis. All vehicles parking on school premises must be registered and display a decal on the lower left side of the windshield. Four parking plans are available to students. The rates under the parking plans will be effective for day students starting with the June term.

Details concerning the types and price of parking permits are sent to students with registration materials each term. When campus parking lots are full, there also is on-the-street parking available.

Financial Aids

For students who have need for financial assistance, there are a limited number of resources available. *All students must be fully accepted by the College into a degree or certain certificate granting programs before financial aid can be awarded.*

1. OHIO INSTRUCTIONAL GRANTS — These grants are intended to provide eligible students with a supplemental source of financial aid in order to attend an eligible Ohio college or university. Consideration and awarding of grants shall be determined and provided by the Ohio Board of Regents and such grants shall only be applied to the instructional and general fees of the college or university in which the student is enrolled. Applications may be obtained from the Ohio Board of Regents in Columbus or the CTC Financial Aid Office.
2. SUPPLEMENTAL EDUCATIONAL OPPORTUNITY GRANTS (SEOG) — This federal grant provides a source of assistance for limited-income families in particular. The grant cannot be less than $200 a year, but none may exceed fifty percent of the college's estimate of the student's financial need. No repayment is required.
3. COLLEGE WORK-STUDY — The College Work-Study Program established by the Economic Opportunity Act of 1964 provides jobs for students from low-income families. The jobs are provided through the college, either on the campus or off.
4. FEDERALLY SPONSORED LOANS — There now are two types of federally sponsored loans generally available.
   A. Loans under the **National Direct Student Loan Program.** Eligible students may borrow up to an aggregate of $2500 during the first two years of college. Repayment and interest charges (4%) do not begin until six months after the student leaves school. Under the NDSL program all money must be repaid to the College. Repayment of funds must be no less than $30 per month.
   B. Partly subsidized loans are made through local lending institutions under the **Guaranteed Loan Program.** Information on these loans is available from local banks, savings associations, credit unions and other lending institutions.
5. THE BASIC EDUCATIONAL OPPORTUNITY GRANT PROGRAM — This is a federal aid program designed to provide financial assistance to students who need it to attend post-high school educational institutions. Grants range from $200 to $1800 depending on the cost of the program of study.
6. SCHOLARSHIPS — A limited number of scholarships are provided by private organizations and community groups for the use of deserving and needy students.

The following scholarships have been obtained by the CTC Office of Institutional Development:

David J. Joseph Company Cooperative Education Scholarship — Taft High School graduate; selected by high school counselor.

Anonymous Cooperative Education Scholarship — Milford High School graduate; selected by high school counselor.

General Electric Company Technology Scholarships — one each for Aiken High School graduate and Princeton High School graduate; selected by respective high school counselor.

Springdale Kiwanis Club Service Organization Scholarship — Princeton High School graduate; selected by high school counselor.

Texo Corporation Cooperative Education Scholarship — Scarlet Oaks Career Development Center graduate; selected by career center counselor.

Tresler Oil Company Technology Scholarship — Western Hills High School minority and/or women graduate enrolling in business management, managerial accounting or business data processing; selected by high school counselor.

Xtek, Inc. Technology Scholarship — student enrolled in manufacturing-machining technology or electro-mechanical engineering technology; selected by sponsor.

The Williamson Company Technology Scholarship — student enrolled in air conditioning/heating technology; selected by sponsor.

Billboard Publications Technology Scholarship — student enrolled in managerial accounting; selected by sponsor.

Kahn's and Company Technology Scholarships — more than one scholarship yearly for students enrolled in electronics technology; selected by sponsor.

Cincinnati Gas & Electric Company Technology Scholarship — four scholarships yearly for minority and/or women students enrolled in electrical power technology or electronics technology; selected by sponsor.

Anonymous Athletic Scholarship — selected by CTC Athletic Director and the Office of Institutional Development.

Tekmar Company Scholarship — awarded to a needy student selected by CTC Financial Aid Office.

Swallen's Department Stores Scholarship — awarded to needy student selected by CTC Financial Aid Office.

For consideration for these programs the student should file: (1) Cincinnati Technical College Application for Financial Aid, (2) A Financial Aid Form, (3) Ohio Instructional Grant Application.

ALL APPLICATIONS SHOULD BE COMPLETED BY APRIL 1 TO INCREASE POSSIBILITIES OF SECURING AID.

Disbursement — All funds except College Work-Study are credited directly to the student's account. Funds in excess of

tuition charges are disbursed to the student after the fifth week of the term. Work-Study students receive a check every two weeks for services performed. Students must submit time-sheets for work-study funds.

Rights and Responsibilities — All aid recipients are required to meet standards of satisfactory academic progress.

All financial aid recipients are required to sign a notarized affidavit of educational purpose which states that the student understands that any financial aid funds received will be used "solely for expenses related to attendance and continued attendance" at CTC.

More detailed information concerning financial aid is contained in the CTC Financial Aid Handbook available from the CTC Financial Aid Office.

RESIDENCE OF STUDENTS

In determining whether or not an enrolled student at Cincinnati Technical College is an Ohio resident, a determination of fact shall be made in accordance with these standards. A non-resident student may have his or her residency status reviewed after living for twelve consecutive months in Ohio.

A. Authority and Effective Date.

1. It is the intent of the Ohio Board of Regents in promulgating this Rule to exclude from treatment as residents, as that is applied here, those persons who are present in the State of Ohio primarily for the purpose of receiving the benefit of a state supported education while insuring that that same benefit is conferred on all bona fide domiciliaries of this State whose permanent residence and legal citizenship is in Ohio, and whose actual source of financial support is subject to Ohio taxation.
2. This Rule shall be effective as of September 1, 1977, and shall continue in effect until its rescission or amendment.

B. Definitions.

For purposes of this Rule:

1. A resident of Ohio "for all other legal purposes" shall mean any person who maintains a 12 month place or places of residence in Ohio, who is qualified as a resident to vote in Ohio and receive state welfare benefits, and who may be subjected to tax liability under Section 5747.02 of the Revised Code; provided such person has not, within the time prescribed by this rule, declared himself or herself to be or allowed himself or herself to remain a resident of any other state or nation for any of these or other purposes.
2. "Financial support" as used in this Rule, shall not include grants, scholarships and awards from persons or entities which are not otherwise related to the recipient.
3. An "institution of higher education" as used in this rule shall mean any university, community college, technical institute or college, general and technical college, medical college or private medical or dental college which receives a direct subsidy from the state of Ohio.

C. General Residency from Subsidy Purposes.

The following persons shall be classified as residents of the State of Ohio for subsidy and tuition surcharge purposes:

1. Dependent students, at least one of whose parents or legal guardian has been a resident of the State of Ohio for all other legal purposes for 12 consecutive months or more immediately preceding the enrollment of such student in an institution of higher education.
2. Persons who have resided in Ohio for all other legal purposes for at least 12 consecutive months immediately preceding their enrollment in an institution of higher education and who are not receiving, and have not directly or indirectly received in the preceding 12 consecutive months, financial support from persons or entities who are not residents of Ohio for all other legal purposes.
3. Persons who live and are gainfully employed on a full-time or part-time and self-sustaining basis in Ohio and who are pursuing a part-time program of instruction at an institution of higher education, their spouses and dependents.
4. Persons who have been reclassified as residents under provisions of Section D.6 of this rule.

D. Specific Exceptions and Circumstances.

1. A person on active duty status in the United States military service who is stationed and resides in Ohio and his or her dependents shall be considered residents of Ohio for these purposes.
2. A person who enters and currently remains upon active duty status in the United States military service while a resident of Ohio for all other legal purposes and his or her dependents shall be considered residents of Ohio for these purposes as long as Ohio remains the state of such person's domicile.
3. Any aliens who entered this country prior to August 9, 1978 and have their visa third preference petition approved by the Immigration and Naturalization Service can be considered permanent residents for purposes of residency determination.
4. No person holding a student or other temporary visa shall be eligible for Ohio residency for these purposes.
5. A dependent person classified as a resident of Ohio who is enrolled in an institution of higher education when his or her parents or legal guardian remove their residency from the State of Ohio, shall be considered a resident of Ohio for these purposes during continuous full-time enrollment and until his or her completion of any one academic degree program.
6. Any person once classified as a non-resident, upon the completion of 12 consecutive months of residency in Ohio for all other legal purposes, may apply to the institution he or she attends for reclassification as a resident of Ohio for these purposes. Should such person present clear and convincing proof that no part of his or her financial support is, or has in the preceding 12 consecutive months been provided directly or indirectly by persons or entities who are not residents of Ohio for all other legal purposes, such person shall be reclassified as a resident.

   Evidentiary determinations under this Rule shall be made by the institution which may require, among other things, the submission of information regarding the sources of a student's actual financial support to that end.
7. Any reclassification of a person who was once classified as a nonresident for these purposes shall have prospective application only from the date of such reclassification.

E. Procedures.

Institutions of higher education charged with reporting student enrollment to the Ohio Board of Regents for state subsidy purposes and assessing the tuition surcharge shall provide individual students with a fair and adequate opportunity to present proof of their Ohio residency for purposes of this Rule. Such institution may require the submission of affidavits and other documentary evidence which it may deem necessary to a full and complete determination under this Rule.

A review of a student's residency status will be made upon proof of proper documentation that the student has been a resident of the state of Ohio for twelve (12) consecutive months prior to the request for residency review. A form for residency review is available in the Registrar's Office. The completed form should be presented to the Dean of Student Services for consideration and evaluation.

Graduation Requirements

To qualify for the associate degree, a student must declare a major and fulfill the program requirements as identified at the time of matriculation, and attain at least a 2.0 core grade point average (GPA) and a 2.0 cumulative GPA. It is the student's responsibility to successfully complete the courses necessary for graduation. A transfer student must take at least forty-five (45) credit hours at Cincinnati Technical College and maintain a 2.0 core GPA and a 2.0 cumulative GPA.

As a part of the graduation requirements, a student must complete at least 21 credit hours in the Communication Skills/ Social Sciences area. Of the 21 credit hours, 12 must be in communication skills and 9 in the social sciences. The communication skills requirement consists of 6 credit hours in written composition, 3 credit hours in technical writing or business communications, and 3 credit hours in oral communication. To complete the minimum requirements in the social sciences, a student, in consultation with an academic advisor, will select a minimum of three courses (nine credit hours) from at least two of the four areas: psychology, economics, sociology, and community relations.

A student who changes programs is subject to the requirements of the new program at the time of the change. A student who extends study beyond the normal two years of study is subject to the requirements of the program as published at the time of admission, or those approved by the division dean. A student who does not enroll for three consecutive terms must be readmitted to the program.

Application for the diploma must be made by the student in the Records Office before May 1 of the year of expected graduation.

Participation in Commencement

The following defines which students may participate in Commencement Ceremonies:

- Students who, as of the completion of the June Term, have satisfactorily completed all requirements for a certificate or degree.
- *Students needing no more than nine credit hours (including co-op) who can complete all degree or certificate requirements during the September Term, may participate based on all the following:
  1. Students register and pay for all remaining courses by the close of advance payment date and present a paid registration receipt to the Vice President for Academic Affairs.
  2. The Vice President for Academic Affairs approves the student's participation.

*Students in the category will be noted in the program to complete their program as scheduled at the end of the September Term. Students will not, at Commencement, be eligible for honors.

Graduation Honors

Students who achieve a cumulative grade point average of 3.50 or higher for five terms will graduate with honors. "Honor" awards will be designated on the degree and will be classified as follows:

Cum Laude	3.50 - 3.79
Magna Cum Laude	3.80 - 3.89
Summa Cum Laude	3.90 - 4.00

Academic Probation and Dismissal

Academic Warning is a notification to new students who are having academic difficulty. A student who has attempted a total of 12-17 credit hours will receive an academic warning if the total grade point average (TGPA) falls below 1.5.

Academic probation means that a student has not maintained the required TGPA. Such a student is given a period during which the student has the opportunity to achieve the required standards or be subject to academic dismissal from the program.

A student shall be on academic probation when the student's total grade point average or core average falls below the average listed for the following designated levels:

Credit Levels	Total Credit Hours Attempted	TGPA	Core GPA
I	18 through 35	1.50	*N.A.
II	36 through 53	1.75	*N.A.
III	54 through 71	2.00	2.00
IV	72 and over	2.00	2.00

*Note: The core GPA is not considered at credit levels I and II

A student not maintaining the above cumulative averages will be placed on academic probation. Each student placed on academic probation will be officially notified in writing of this status and be given an opportunity to respond to the notification. Non-degree credit courses will not be calculated in the TGPA.

A student designated as on academic probation is subject to the following:

- the student may not enroll for more than twelve (12) credit hours or four (4) courses without the permission of the student's program coordinator/faculty advisor.
- the student may not be eligible to enroll for Cooperative Education or Clinical Experience/Directed Practice without the permission of the program coordinator.
- a student placed on academic probation may be advised to withdraw or will be subject to academic dismissal from the program if the student does not attain the appropriate GPA upon entering the next credit level. The student is then notified by letter of pending dismissal from the program and given an opportunity to arrange for a student hearing to request an extension of the probationary period.

Reinstatement Following Academic Dismissal

A student academically dismissed from a program will be eligible to apply for reinstatement one calendar year after the date on the letter of academic dismissal. In order to be reinstated into the program from which the student was dismissed, a student must submit a request in written form to the appropriate division dean. Final permission will be decided by the division dean.

Academic Appeals Procedure

A procedure allowing a student to appeal academic decisions is on file in the Office of the Vice President for Academic Affairs.

Grades and Credit Earned

Grading System

The following system is used to record student achievement or status in each subject:

Grade	Quality	Points Per Credit Hour
A	Excellent	4
B	Good	3
C	Average	2
D	Poor	1
F	Failing	0
I	Incomplete	Not Computed
W	Withdrawal	Not Computed
X	Audit	Not Computed
K	Transfer Credit	Not Computed
S	Satisfactory	Not Computed
U	Unsatisfactory	Not Computed
IP	In Progress	Not Computed
N	No Grade Reported	Not Computed
AC	Advanced Placement Program Credit	Not Computed
CL	CLEP Credit	Not Computed
EC	CTC Proficiency Examination Credit	Not Computed
EX	Work Experience Credit	Not Computed
VO	Vocational Teacher Referral Credit	Not Computed

If a course is repeated, only the highest grade is computed in the calculation of the TGPA. If a student earns the same grade upon repeating a course, only one grade will be computed in the calculation of the TGPA.

Incomplete (I)

When circumstances beyond the control of the student prevent the completion of course requirements during the quarter, an "I" (Incomplete) is recorded until the final grade is established. An Incomplete can be assigned only when a student makes arrangements for subsequently fulfilling the course requirements with the instructor prior to the end of the term. The work must be completed within five (5) weeks after the end of the term in which the grade of "I" was assigned. Otherwise, a final grade of "F" is automatically recorded.

In Progress (IP)

An instructor of a self-paced course may assign a grade of "IP" (In Progress) to a student who has been unable to complete all of the modules within the normal ten weeks. The student will then be allowed a maximum of an additional ten (10) weeks to complete the course. Students should not register for this course during this ten (10) week period. If the "IP" is not removed within the additional ten (10) weeks, a grade of "F" will be recorded.

No Grade Reported (N)

An "N" grade is administratively assigned in those instances in which no final grades have been reported for the courses to the Records Office.

Course Withdrawal (W)

A student desiring to withdraw from a course may do so at any time up to the last two weeks of classes of a term and will receive a grade of "W" for the course. The student must initiate and inform the Records Office in writing of the intent to withdraw. The date of the withdrawal will be the date the notice is received in the Records Office. A grade of "F" is assigned as the final grade in a course if a student discontinues attendance without officially dropping the course.

Audit (X)

Students auditing a course should understand that the course is for information purposes only, and that no college credit may be earned or later claimed for the course audited. Class attendance, completing assignments, taking exams, etc. are the prerogatives of the student in an audit course. Regular tuition is charged for audit registration.

A student may not request a transfer from "credit" to "audit" or vice versa, after completion of the second week of the academic term.

Transfer of Credit (K)

(A minimum of 45 credit hours must be earned at Cincinnati Technical College.)

A matriculated student desiring transfer of credit from other colleges must request any colleges previously attended to forward directly to the Director of Admissions a transcript of academic record and the college catalog. Courses paralleling those of Cincinnati Technical College in which the student has received a grade of "C" or better will be considered for credit.

A matriculated student should apply for a credit transfer with the program coordinator before the end of the first term. If transfer credit is to be applied to the first term, the student must see the coordinator before the end of the first week of the term. After the transfer form is completed and is approved by the division dean, the student will receive a copy of the transfer form.

Advanced Standing Credit

(A minimum of 45 credit hours must be earned at Cincinnati Technical College.)

Advanced standing credit may be earned in the following ways and substitutes for taking the course at CTC:

- **Credit Through Proficiency Examinations**
  - External Exams (AP or CL)
    Proficiency examinations are offered by national testing services such as the Advanced Placement Program (APP) of the College Entrance Examination Board and the College Level Examination Program (CLEP). Only courses which can be substituted for courses in the curriculum to be followed at CTC can be accepted. A score of "3" or better must have been earned in each such course. No fee is charged at CTC for this service.
  - CTC Exams (EC)
    Proficiency examinations are offered by each of the academic divisions at CTC. Such exams may be taken prior to or after enrollment in a specific course. If a student has already enrolled in a course and wishes to take a proficiency exam to receive credit, the student must submit a request form to the appropriate division before the completion of the second week of the academic term. The tuition payment will cover the cost of the examination. However, if a student fails the exam and must continue in the course, a $5.00 fee will be charged.

If a student wishes to take the proficiency exam prior to enrolling in a course, the student must contact the respective division dean. A $25 fee is charged for the examination.

- **Credit Through Documented Valid Academic or Work Experience (EX)**
  Each academic division will evaluate documentation which either:
  - indicates course content and hours such as that provided by military programs, industrial programs and hospital programs, or
  - provides evidence that the applicant has already demonstrated through successful work experience those skills or competencies which are the desired end-product of one or more courses the applicant would ordinarily take in the Cincinnati Technical College program curriculum.
- **Credit Through Senior Vocational Teacher Referral (VO)**
  Students who have earned an "A" or "B" in their completed high school vocational program of Butler County Joint Vocational School, Cincinnati Public Schools, Colerain Vocational Center, Northwest Vocational Center, The Great Oaks Joint Vocational Schools, U.S. Grant Joint Vocational Schools, Warren County Joint Vocational School and West Clermont County Career Center can earn credit for specific courses in related technical programs at Cincinnati Technical College if the senior teacher of their program submits a recommendation on the Advanced Standing Referral Form to waive such courses. Students who desire to earn credit by this means are advised to inquire about the articulation program with their coordinator. No charge is made for the courses for which credit is received.

Other Academic Policies

Registration

Students registering for the first time will receive detailed information in advance of the first term. Class scheduling, advisement and registration will take place on registration/orientation days for first term students.

Currently enrolled students register for classes during the last two weeks of the term for the next term and/or the alternate term if they will be out on co-op.

Students must make or arrange tuition payments at least one week prior to the beginning of the term. Students who fail to make payments before the deadline cannot be assured of class schedules consistent with their planned program curricula.

Students may be assigned to either classes or cooperative education for the first term depending upon individual program requirements and the student's date of acceptance.

Withdrawal From And Readmission To A Program

A matriculated student who fails to enroll for three (3) consecutive terms will be considered withdrawn. In such a case, the student must apply for readmission to the program and will be subject to re-evaluation upon the student's return and may be held to any change of degree requirements during the student's absence.

Off-Campus Credits

Credit for courses earned at another institution while a student is currently enrolled at CTC can be applied toward the degree only with the prior approval of the program coordinator. The form for Permission to Register for Off-Campus Credit can be obtained in the Student Records Office. The form must be completed prior to registering for the course.

Dean's List

In recognition of academic excellence, a Dean's List is compiled each academic term. To qualify, a student must have an average of 3.5 or greater in the term and must have completed 12 or more credit hours in that term.

Changing Technologies

Students transferring from one technology to another must secure written approval for acceptance into the alternate program. An official withdrawal must be made with the coordinator of the technology from which the student is transferring.

Only courses which are applicable to the new program curriculum will be computed in the student's TGPA.

Cooperative Education Program

The College's rapid growth and development is due, in part, to the institution's strong commitment to cooperative education. The co-op experience is an integral part of those programs which offer co-op courses as part of their curriculums. The co-op program is vital to the strength and continued success of the College.

Co-op Requirements

Students attending Cincinnati Technical College may meet their associate degree co-op requirements by one of three ways:

1. Participating in CTC's full co-op program, in which students alternate full-time quarters in the classroom with full-time quarters of co-op employment.
2. Attending classes on a half-day schedule for ten consecutive quarters and co-oping in a half-time (or longer) position.
3. Students wishing to pursue a totally academic program may do so. However, the total number of required credit hours, including co-op credit hours, must be completed. Academic courses and/or work experience may be used in lieu of co-op credits with divisional approval.

Co-op Credit Through Documented Valid Work Experience

Valid work experience may be used in lieu of co-op courses provided the student has already demonstrated through successful work experience those skills or competencies which are the desired end-product of one or more co-op courses the applicant would ordinarily take in the Cincinnati Technical College program curriculum.

One to thirteen co-op credits can be awarded for documented work experience. Students must provide evidence of both time and quality of experience; e.g., portfolio, references, etc. **This credit should be applied for and granted prior to the first co-op term.** A single fee of $25 will be charged.

Academic Requirements

Students desiring co-op credit must maintain the required grade point average as stated in the College catalog (see academic probation and dismissal). Students must also demonstrate satisfactory proficiency in core courses or other requisite courses.

If the student does not maintain the required G.P.A., the student will not be eligible to enroll in co-op courses or Clinical Experiences/Directed Practice without the permission of the program coordinator.

Co-op Experience

The College has been quite successful in placing students in cooperative work jobs. However, there can be **NO ABSOLUTE GUARANTEE.** Cooperative employment and continued employment depends on what the individual can offer to employers. Students who have not demonstrated employability in some form may be advised to discontinue the co-op program.

The employer is solely responsible for decisions regarding hiring, retention, dismissal, promotion or demotion of a co-op.

Experience indicates that when students decide to quit school for full-time employment with a co-op employer, this decision is usually regretted in the long run by both employer and student. Neither student or employer should attempt, under any circumstances, to influence the other for permanent employment until the student has completed the entire two-year program.

Types of Co-op Positions

The College classifies co-op positions in three categories: A — directly related to the technology; B — indirectly related; C — unrelated.

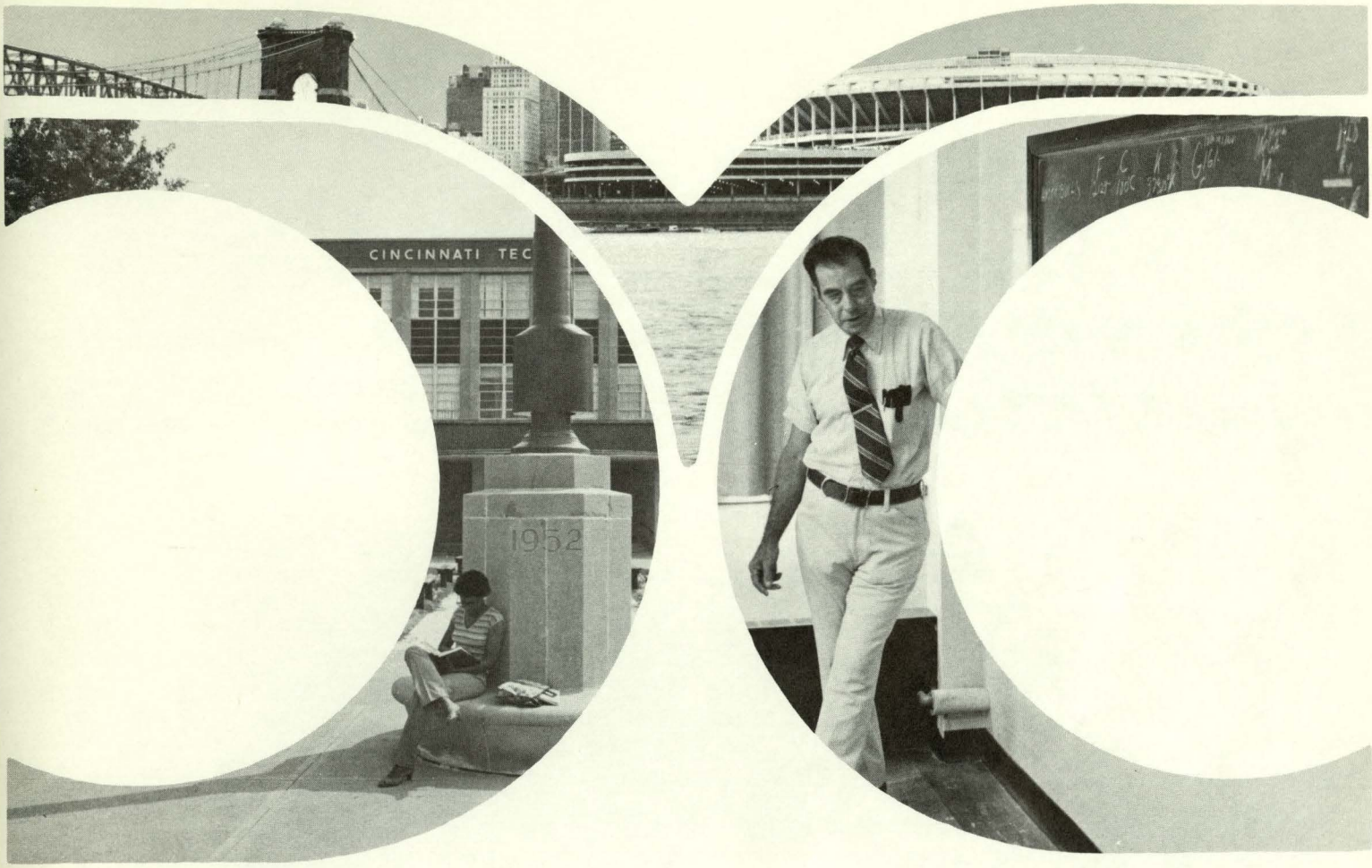
When possible, the College would like to place all students in A-type jobs, in B jobs as a second choice; and in C jobs as the third choice. However, it should be recognized that both B and C jobs have many values. The work experience gained in B and C jobs prepares the student for occupational advancement and helps the student mature emotionally, socially, and educationally.

Greater Cincinnati Consortium of Colleges and Universities

Twelve institutions of higher learning in the Cincinnati area, including Cincinnati Technical College, are members of the Greater Cincinnati Consortium of Colleges and Universities. Among the benefits of the Consortium is that regularly enrolled **full-time students** of one institution, under certain conditions, may register for credit in courses offered by other Consortium institutions in which no instruction is available at their own institution. Contact the Records Office for information.

Project Ahead

Cincinnati Technical College cooperates with the U.S. Army in an educational program called Project Ahead that permits an enlisted person to accumulate college credit at CTC while serving a tour of duty elsewhere. The course credit may come from courses taken at colleges near the military base where the student is stationed, special military training approved by the coordinator and the division dean, or through the College Level Examination Program (CLEP). An applicant who is enlisting in or is already an enlisted member of the U.S. Army and who meets the CTC entrance requirements is eligible. Contact the Director of Admissions for full details.



STUDENT INSTRUCTIONAL SUPPORT SERVICES

CATALOG 81-82

STUDENT INSTRUCTIONAL
SUPPORT SERVICES

CATALOG 81-82

Student Services

As a service to students and to the community, Cincinnati Technical College maintains a staff of professional counselors to assist students in making intelligent decisions regarding their career, educational and personal-social plans. Special services provided by the Student Services staff include counseling, financial aids and veterans affairs.

Counseling

The Office of Counseling Services maintains a professional staff to assist students. All sessions are confidential and free of charge to all students.

The following services are provided by the counseling staff:
Counseling — counsel students regarding personal, social, or academic problems or concerns.
Career Counseling — help students and potential students with career decisions and concerns through testing, individual conferences and/or career development coursework.
Admissions Advising — advise students regarding general admissions; assist students in choosing programs; and refer students to program coordinators.
Educational Transfer Counseling — assist students interested in continuing their education at other colleges or universities.
International Students — provide admissions, immigration and naturalization assistance.
Special Assistance — provide assistance to students with special needs, and students in special programs, i.e., Job Corps and CETA.
Information — provide students with information regarding College policies, health insurance, housing, etc.

If a situation develops which the staff feels unprepared to handle, the student will be referred to an appropriate professional.

The Office of Counseling Services is located in room 157. Office hours are 8:00 a.m. to 5:00 p.m. Monday through Friday, and until 8:00 p.m. on Tuesday and Wednesday.

Living Accommodations

CTC has no student housing facilities of its own as it is primarily a "commuter" institution. However, for individuals living too far from the College to commute, reputable, efficiently-operated living accommodations are available at reasonable costs. For information concerning housing facilities, contact the Office of Admissions and Counseling.

Veterans

Cincinnati Technical College has a Veterans' Affairs coordinator to aid persons attending school on V.A. benefits. The Veterans' Affairs personnel will help students with official paperwork and information regarding benefits. All programs at Cincinnati Technical College are fully approved by the State Approving Agency for Veterans Training. Upon being accepted by CTC, veterans should contact the Admissions and Counseling Office for full information concerning application for Veterans' Educational Benefits.

Tutorial services can be arranged for veterans in need of academic assistance. The Veterans Administration will reimburse the veteran for this cost. Fair and reasonable charges for this service will be determined by the Coordinator of Veterans' Affairs prior to approval of tutorial assistance.

Whenever possible, a student tutor will be utilized. However, when there is not a qualified student tutor available, the Veterans' Affairs personnel will attempt to find a qualified faculty tutor. Please contact the Admissions and Counseling Office for further information.

The State Approving Agency for Veterans Training has approved Cincinnati Technical College for the education and training of veterans under the 1966 GI Bill and orphans of veterans under Public Law 634 and 88-361.

Student Activities

Under the leadership and coordination of the Director of Athletics and Student Activities, professional staff members work together to provide a diversity of out-of-class activities and services designed to promote the personal development of each student.

Student Senate

One student and an alternate are chosen from each technology. Officers are elected by the Senate for each of the two student sections. Meetings are held weekly on Tuesdays at alternating times, 11:00 a.m. or noon.

All CTC students are encouraged to attend Senate meetings. The Senate is involved in all student activities and acts as a liaison between students and the administration.

Athletics

The Tigers of Cincinnati Technical College are working to build a winning tradition in athletics. As members of the National Junior College Athletic Association (NJCAA), the Tigers compete in an ever-expanding intercollegiate sports program.

On the horizon at Cincinnati Tech is an expanding athletic program in both men's and women's sports. At the present time CTC offers intercollegiate men's basketball and women's volleyball.

In basketball the Tigers are a member of Region XII of the NJCAA and play a very competitive junior college schedule. In the 1980-81 season the Tigers compiled a 27-6 record.

Along with the intercollegiate competition, Cincinnati Technical College offers an expanding intra-mural program. Class competition is intense in basketball, softball and volleyball. More programs will be added in the future. The gymnasium and swimming pool are open for student use each day.

Learning Resource Center

The Learning Resource Center includes the Johnnie Mae Berry Library and the Instructional Media Center. The LRC is open from 7:30 a.m. to 9:30 p.m. Monday through Thursday and from 7:30 a.m. to 4:30 p.m. on Fridays. The spacious new three-level LRC is both functional and attractive.

Johnnie Mae Berry Library

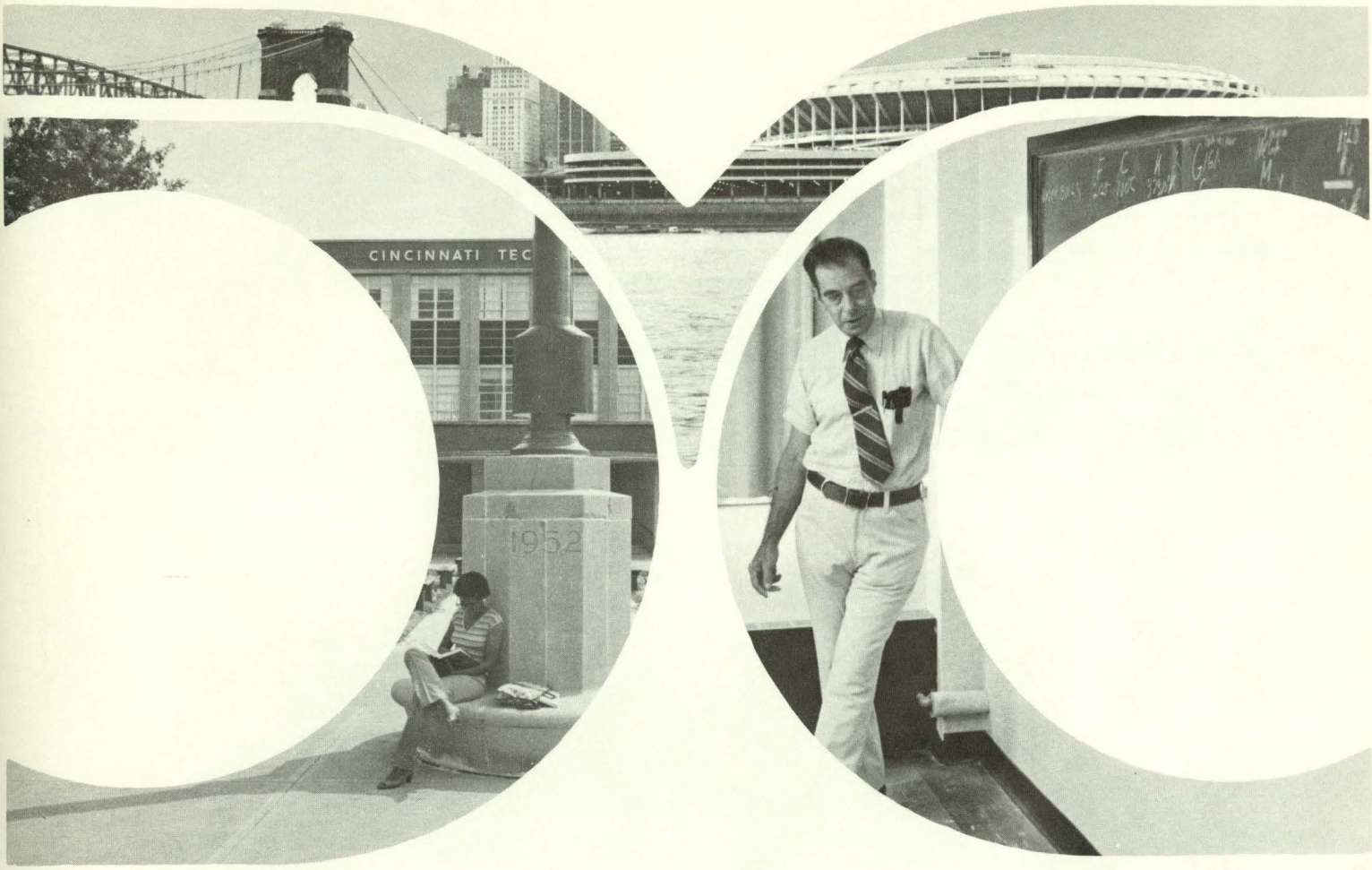
The Johnnie Mae Berry Library, named for CTC's first librarian, contains a growing collection of books and periodicals in various technologies as well as in general areas. A cour-

teous and friendly staff is available for assistance at all times to assist in finding information.

The library includes a computer terminal room, group study rooms, a typing area, carrels equipped for audio-visual equipment and carrels and tables for quiet study.

Instructional Media Center

The Instructional Media Center is a unit which provides audio-visual support for faculty, students and administrative staff. Students have access to various forms of audio-visual materials such as audio tapes, slides, filmstrips, videotapes, etc. The materials are to be used with the appropriate piece of equipment within the LRC. Materials may be borrowed at the charging counter of the Media Services area.



ACADEMIC DIVISIONS, DEGREE & CERTIFICATE PROGRAMS

CATALOG 81-82

ACADEMIC DIVISIONS, DEGREE & CERTIFICATE PROGRAMS

CATALOG 81-82

Academic Divisions

Cincinnati Technical College has six academic divisions and departments which offer credit courses: Health Technologies, Business Technologies, Communication Skills/Social Sciences, Developmental Education, Engineering Technologies and Physical Science/Mathematics.

Two of these six—Communication Skills/Social Sciences and Developmental Education—are non-degree granting divisions. However, their roles are essential to the academic success and career progression of students.

Communication Skills/ Social Sciences Division

Philosophy of Communication Skills

The Communication Skills Division recognizes that each individual is a unique combination of attitudes, beliefs, values and experiences. Sharing this uniqueness with others is a basic need; however, individual differences can cause barriers to communication. Therefore, the Division offers students a proven process with identifiable stages: 1) planning the message, 2) the initial verbalizing of the message and 3) refining techniques to produce a final written or oral presentation of the message. This process will enable each student to break down the barriers to communicate more effectively with others.

Goals of Communication Skills

Students will be able to:

1. Understand the elements of problem solving.
2. Employ various research techniques including the development of a thesis.
3. Distinguish between logical and fallacious arguments.
4. Understand written and oral communication.
5. Analyze the audience for a communication.
6. Write various types of business and technical communications.
7. Present information and technical material in a clear, organized speech.
8. Use clear, concise language at the level acceptable in business, industry and health professions.

Philosophy of the Social Sciences

Cincinnati Technical College has as its mission the provision of quality technical education. In order to function successfully on the job, technicians must have both a practical knowledge of their fields and a grasp of the framework within which they work. Essentially, it is the "social world" that forms the framework within which technical skills develop and are applied. Each of the social sciences provides a distinctive perspective of this framework. The social sciences allow students to see the relationship of their technical skills to industry, community and country, thus making for both a more productive worker and a more contented person.

Goals of Social Sciences

Students will be able to:

1. Understand the basic conceptual framework of the social sciences.
2. Develop the relationship between the individual and the social/psychological processes so that each student can see his or her role within the ever present social/psychological networks.
3. Grasp the analytical and methodological tools necessary to either control or adapt to changes in a social/psychological environment.

The Writing Center

Individualized Courses—Currently, Communication Skills courses 1001, 1002, 1009, 1010 and 1011 are also offered on an individualized, self-paced basis. These courses cover all the material contained in the lecture-discussion classes but allow students to progress through the material at their own pace. Students move from one unit of learning to the next as they demonstrate a minimum proficiency of eighty percent. All learning packets, additional activities and resources as well as individualized diagnosis and instruction are available through the Writing Center. Individualized, self-paced courses being offered each term are designated by the letters IND.

Other Services—Instructors of Communication Skills staff The Writing Center to provide all students with help they need in any writing or other communication problems. Students can usually be accommodated on a "drop-in" basis or may request an appointment.

Requirements

To qualify for the associate degree, a student must complete at least 21 credit hours, 12 must be in communication skills and 9 in the social sciences. The communication skills requirement consists of 6 credit hours in written composition, 3 credit hours in technical writing or business communications, and 3 credit hours in oral communication. To complete the minimum requirements in the social sciences, a student will select a minimum of three courses (9 credit hours) from at least two of the four areas: psychology, economics, sociology and community relations. The following is a list of the courses which constitute each of the areas:

Communication Skills

Composition:
- 1001 Communication Skills I
- 1002 Communication Skills II
- 1007 Research and Logic
- 1009 Business English

Technical Writing and Business Communications:
- 1010 Technical Writing
- 1011 Business Communications

Oral Communication:
- 1020 Effective Speaking
- *1021 Human Relations

Social Sciences

Psychology:
- *1021 Human Relations
- 1505 The Psychology of the Inner World of the Person
- 1506 The Psychology of the External World of the Person

Economics:
- 1512 Microeconomics
- 1513 Macroeconomics

Sociology:
- 1521 Introduction to Sociology

Community Relations:
- 1531 Introduction to Political Science
- 1532 Introduction to Labor Studies
- 1533 Labor Law
- 1534 Organized Labor in American Politics
- 1535 Labor Management Relations
- 1536 Practical Government
- 1537 Ethics

*Credit can be applied to either the communication skills requirement or the social sciences requirement.

Developmental Education Program

The Developmental Education program consists of three component parts to assist students in preparing for their technical programs.

Courses

Each Developmental Education course has been developed around specific objectives which relate to the courses required for the various technologies. Diagnostic techniques are used to determine individual deficiencies, to measure individual progress, and to determine when the student has met the established course objectives.

Developmental Education courses are designed to develop specific minimum competencies in each subject area. The grades for courses numbered from 0001 to 0041 are based on achievement of the identified competencies. Only grades of A, B, IP and F are awarded in these courses. Each specific course has a predefined criteria to earn a grade of A, B, IP or F.

Through the use of specialized methods and modern equipment and with an extensive reliance upon learning laboratory experiences, the student may progress at an individualized rate in most courses. The student will be tested frequently to assist in ascertaining progress.

The following courses are offered:

		Credits
#0001	English Grammar	3
#0002	College Spelling	2
#0003	Basic Writing I	3
#0004	Basic Writing II	3
#0007	Telephone Techniques	1
#0008	Oral Reports	2
#0010	College Reading I	3
#0011	College Reading II	3
#0012	Technical Reading I	3
#0013	Technical Reading II	3
#0014	College Study Skills	3
#0020	Basic Mathematics I	3
#0021	Basic Mathematics II	3
#0022	Essentials of Mathematics	6
#0024	Basic Algebra I	3
#0025	Basic Algebra II	3
#0030	Basic Concepts of Biology	3
#0031	Basic Concepts of Chemistry	3
#0040	Interpersonal Development	3
#0041	Interpersonal Communications	3
#1170	Introduction to Technical Mathematics	4
#2200	Basic Chemistry	3
#2270	Introductory Laboratory Science	3

Laboratory

Developmental Education also serves students who have been accepted into technical programs and are pursuing a full or part-time schedule of classes. On the mezzanine floor of the Learning Resource Center there is a well-equipped, open laboratory where students may increase their skills in reading, English and mathematics, etc.

Tutorial Services

Tutoring is offered to those who want and need more instruction, more practice or more discussion in a particular subject. At the beginning of each term, students sign up for tutoring hours in the subjects of their choice. As soon as a qualified student-tutor is located, weekly sessions are scheduled. Tutoring may be conducted in small groups or individually. There is no cost to students as the College pays for the student-tutors.

Health Technologies Division

The Health Technologies Division at Cincinnati Technical College brings together in one unit all programs for the education and training of health personnel. The division offers several associate degree and certificate programs. Additionally, the division offers special courses, workshops, seminars and forums at which persons can learn new skills and acquire new knowledge or update the knowledge and skills needed to perform effectively on their jobs.

Dietetic Assistant

The Dietetic Assistant Program, beginning in September, 1981, incorporates a concept more relevant to the changing world of dietetics. It is enlarged and improved to include the complete first year of the associate degree program leading to Dietetic Technician status. Upon completion of this one-year program, the graduate will be awarded a certificate. This graduate may then be employed as a superior Dietetic Assistant or, if accepted, continue his or her education for one additional year and become a Dietetic Technician.

The program may be pursued full- or part-time, day or evening. Selected courses may be offered on Saturdays. All courses are directed and supervised by the College dietetic faculty.

The program leading to a certificate as a Dietetic Assistant begins every September, and includes courses in communication skills, the basic sciences, normal nutrition, basic diet therapy, human growth and development, nutrition and food preparation and food service management. Directed practice at area hospitals and area health care agencies including extended care facilities coordinates the nutrition theory with appropriate clinical experiences.

The assistant assumes a wide range of responsibilities assisting the Registered Dietitian or Dietetic Technician in nutrition care and food service supervision. Activities in which the assistant is involved include collection of nutrition care data, utilizing beginning assessment tools, teaching valuable basic nutrition concepts to individuals of varied age groups and social backgrounds, planning menus with simple diet modifications, training and scheduling food service employees, and supervising food production and service.

The program more than fulfills all requirements specified by Medicare/Medicaid regulations of participation. The program also has been given approval by the American Dietetic Association. Graduates are eligible for H.I.E.F.S.S. membership and certification.

Dietetic Assistant Curriculum

Prerequisites: High school algebra		Hours Per Week Class	Lab	Credit Hours
■ First Term				
4000	Medical Terminology	3	0	3
4001	Introduction to Health Care System	2	0	2
4010	Human Biology	3	0	3
4111	DT Orientation & Directed Practice I	1	3	1
4130	Introduction to Nutrition	3	0	3
____	Communication Skills Elective	3	0	3
		15	3	15
■ Second Term				
1150	Introduction to Science Mathematics	4	0	4
2200	Basic Chemistry	2	3	3
4102	Nutrition for the Life Cycle	4	0	4
4120	Nutrition and Food Preparation	2	6	4
4112	DT Directed Practice II	0	6	1
4121	Meal Management	3	0	3
		15	15	19

Third Term			
9301 Cooperative Employment	1	40	2
Fourth Term			
1021 Human Relations	3	0	3
4030 Technology of Education for Health	1	3	2
4031 Health Care Management	3	0	3
4105 Introduction to Clinical Nutrition	4	0	4
4113 DT Directed Practice III	0	8	1
4122 Food Service Management I	3	3	4
	14	14	17
Fifth Term			
9302 Cooperative Employment	1	40	2
			55

Dietetic Technician (nutrition care emphasis)

The Dietetic Technician is a professional in the challenging and ever changing field of nutrition and dietetics. A dietetic technician is employed in the nutrition department of a hospital, nursing home, extended care facility, health maintenance organization, school or day care center. The graduate may also secure a position in a clinic, health department, or with a federal, state, or local nutrition program or agency.

The technician assumes a wide range of responsibilities assisting the Registered Dietitian in nutrition care and departmental administration. The Dietetic Technician may be responsible for many aspects of health care, from nutrition care and education of clients to the management of institutional food service.

The graduate technician assumes the following responsibilities:

1) gathers assessment data and information for nutrition care plans;
2) does preliminary assessment for all patients and records in patient records;
3) provides routine counseling for patients **not** at nutritional risk;
4) serves as a liaison and troubleshoots any real, perceived or potential problems in the area of food and/or nutrition services;
5) consults routinely with the Registered Dietitian.

The program leading to an associate degree in Dietetic Technology begins every September and includes courses in communication skills, the basic sciences, and clinical nutrition. Directed practice at area hospitals and area health agencies coordinates the dietetic theory with appropriate clinical experiences. The Dietetic Program participates in the College concept of field related, paid cooperative experiences. This unique concept provides the student with the opportunity to gain practical experience in the dietetics field while earning money toward his or her college education.

The program has been granted approval by the American Dietetic Association. Graduates of the program are eligible for membership in the American Dietetic Association.

Students interested in the program should have successfully completed the Dietetic Assistant program.

Dietetic Technician Curriculum

Prerequisites: Completion of the CTC Dietetic Assistant Program (55 credit hours) with a 2.5 TGPA and 2.75 core average	**Hours Per Week Class**	**Lab**	**Credit Hours**
First Term			
4005 Chemistry for Health Technology	3	2	4
4009 General Microbiology	3	3	4
4106 Nutrition in Disease	4	0	4
4114 DT Directed Practice IV	0	10	2
____ Communication Skills Elective 2	3	0	3
	13	15	17
Second Term			
9303 Cooperative Employment	1	40	3
Third Term			
1020 Effective Speaking	3	0	3
4107 Diet Therapy	4	0	4
4115 DT Directed Practice V	0	10	2
4123 Food Service Management II	3	3	4
____ Social Science Elective	3	0	3
	13	13	16
Fourth Term			
9304 Cooperative Employment	1	40	3
Fifth Term			
4002 Community Health Services	2	0	2
4061 Contemporary Health Care Issues	3	0	3
4109 Dietetics Seminar	2	0	2
4116 DT Directed Practice VI	0	8	1
____ Communication Skills Elective 4	3	0	3
____ Social Sciences Elective	3	0	3
	13	8	14
			53

General Electives
Communication Skills Elective 1 - 1001 or 1002
Communication Skills Elective 2 - if 1001 first: 1002, 1009
- if 1002 first: 1007, 1009
Communication Skills Elective 3 - 1020 or 1021
Communication Skills Elective 4 - 1010 or 1011

Social Sciences Electives
Group 1 - Psychology: 1505, 1506, 1021
Group 2 - Economics: 1512, 1513
Group 3 - Sociology: 1521, 1522
Group 4 - Community Relations: 1531, 1533, 1535, 1536, 1537
Three courses from at least two groups.

Medical Assistant Technology

The Medical Assistant is a versatile person who helps the physician respond to the increasing demands of the medical profession. The Medical Assistant is an essential link between the physician and the patients, health care facilities, professional associates and the suppliers of equipment and medications.

The duties of the Medical Assistant are broad in scope, including both clinical and administrative responsibilities. The administrative Medical Assistant answers the incoming phone calls, receives patients and visitors to the office, handles correspondence and filing, maintains patients' records, and reports, transcribes medical records and reports, schedules hospital/laboratory/x-ray admissions and tests, processes insurance claims and forms, makes appointments for patients, and does bookkeeping.

The Clinical Assistant measures weights and heights of patients, records histories, takes vital signs, assists the physician in the examination rooms, interviews patients, performs electrocardiograms, gives injections, prepares patients for diagnostic tests, and performs routine laboratory procedures. Both the administrative and clinical duties are important, as few physician offices have assistants who perform only one set of functions.

Clinical rotations, or externships, are supervised work experiences for students to develop competencies in the skills needed of the Medical Assistant. Students receive no monetary reimbursement for these experiences.

The program is accredited by the American Medical Association's Committee on Allied Health Education in collaboration with the American Association of Medical Assistants.

Upon successful completion of the program and after one full year of work experience, students are eligible to take the Certified Medical Assistant Examination given by the American Association of Medical Assistants.

Students interested in entering the program should take basic chemistry, biology and algebra in high school or prior to entering the program. These courses are offered at the College. Students must also be able to type 35 words per minute or complete a Typing I course prior to admission to the program.

Medical Assistant Technology Curriculum

Prerequisites: High school chemistry, biology, algebra & typewriting (35 wpm) or equivalent	Hours Per Week Class	Lab	Credit Hours
■ First Term			
1001 Communication Skills I	3	0	3
3002 Typewriting II	2	3	3
4000 Medical Terminology	3	0	3
4001 Introduction to Health Care	2	0	2
4005 Chemistry for Health Technology	3	2	4
4201 Medical Office Practice	2	8	4
	15	13	19
■ Second Term			
3055 Medical Office Transcription	1	3	2
4011 General Anatomy	2	3	3
4131 Developmental Nutrition	4	0	4
4202 MA Clinical Assisting I	2	8	4
4208 Insurance & Patient Records	2	2	3
	11	16	16
■ Third Term			
9311 Clinical Cooperative Education	1	40	2
■ Fourth Term			
1002 Communication Skills II	3	0	3
1021 Human Relations	3	0	3
4012 Human Physiology I	3	2	4
4203 MA Clinical Assisting II	2	8	4
4204 Medical Procedures I	2	8	4
	13	18	18
■ Fifth Term			
4211 MA Clinical Experience I	0	20	3
___ Communication Skills Elective 3	3	0	3
___ Social Sciences Elective	3	0	3
___ Social Sciences Elective	3	0	3
	9	20	12
■ Sixth Term			
1010 Technical Writing	3	0	3
4013 Human Physiology II	3	2	4
4017 Pharmacology	5	0	5
4205 Medical Procedures II	2	8	4
	13	10	16
■ Seventh Term			
4212 MA Clinical Experience II	1	20	3
■ Eighth Term			
2909 Office Accounting I	2	3	3
4009 General Microbiology	3	3	4
4020 Fundamentals of Pathophysiology	5	0	5
4031 Health Care Management	3	0	3
4209 Medical Assisting Seminar	0	5	2
	13	11	17
■ Ninth Term			
9312 Clinical Cooperative Education	1	40	2
			105

General Electives

Communication Skills Elective 3 - 1020 or 1021

Social Sciences Electives

Group 1 - Psychology: 1505, 1506, 1021
Group 2 - Economics: 1512, 1513
Group 3 - Sociology: 1521, 1522
Group 4 - Community Relations: 1531, 1535, 1537
Three courses from at least two groups.

Medical Laboratory Technician

Medical Laboratory Technicians provide much of the information needed by the physician to diagnose and treat patients. They are needed in the laboratories of hospitals, clinics, research centers and industry. In biochemistry, hematology, microbiology and blood bank laboratories, they are vital parts of the health care team. In research laboratories they are assisting in the research of cancer, heart disease, birth defects, etc.

Medical Laboratory Technicians employed in a laboratory, hospital or clinic may specialize in one or two of the several areas of laboratory work or may rotate through all the departments in the laboratory. In biochemistry, they perform chemical analysis of the blood for constituents including glucose, urea, chloride, sodium, potassium and enzymes. In hematology, they take blood samples from patients, count red and white cells, determine coagulation bleeding and prothrombin times, measure sedimentation rates, and determine hemoglobin concentrations. In microbiology, they prepare and stain slides, grow cultures from urine, feces and wound specimens, determine the susceptibility of bacteria to antibiotics, and examine specimens for parasites. In blood bank, they type blood from patients, crossmatch blood for transfusion, draw and process blood from donors. In serology, they examine specimens for antibodies against various diseases.

Students enrolled in this program spend alternating ten-week terms in school and in clinical laboratory experience. Students rotate through the laboratories performing procedures from the following areas: hematology, coagulation and urinalysis, chemistry, blood bank, serology, microbiology and special procedures.

Students interested in entering this program should take high school algebra, biology and chemistry courses prior to entering the program.

The College is currently seeking accreditation of its program from the American Medical Association's Committee on Allied Health Education in collaboration with the National Accrediting Agency for Clinical Laboratory Services. Graduates of the program may apply to the Board of Registry of the American Society of Clinical Pathology to take the certification examination. Persons passing the exam are recognized as Medical Laboratory Technicians (MLT).

Medical Laboratory Technician Curriculum

Prerequisites: High school algebra, biology & chemistry or equivalent	Hours Per Week Class	Lab	Credit Hours
■ First Term			
4000 Medical Terminology	3	0	3
4001 Introduction to Health Care	2	0	2
4005 Chemistry for Health Technology	3	2	4
4301 Basic Laboratory Techniques	1	3	2
4302 Basic Hematology & Urinalysis	4	6	6
4311 Clinical Application I - Hematology & Urinalysis	0	6	2
	13	17	19
■ Second Term			
4012 Human Physiology I	3	2	4
4351 ML Clinical Experience I	1	24	4
	4	26	8
■ Third Term			
1151 Science Mathematics I	4	0	4
4303 Immunology	3	0	3
4304 Clinical Chemistry	4	3	5
4312 Clinical Application II - Clinical Chemistry	0	6	2
___ Communication Skills Elective 1	3	0	3
	14	9	17
■ Fourth Term			
4013 Human Physiology II	3	2	4
4352 ML Clinical Experience II	1	24	4
	4	26	8

■ Fifth Term			
4009 General Microbiology	3	3	4
4305 Blood Bank - Serology	4	6	6
4313 Clinical Application III - Blood Bank - Serology	0	6	2
___ Social Sciences Elective	3	0	3
___ Communication Skills Elective 2	3	0	3
	13	15	18
■ Sixth Term			
9302 Cooperative Employment	1	40	2
■ Seventh Term			
2244 Health Physics	3	2	3
4306 Clinical Microbiology	4	6	6
4307 Hematology II	2	3	3
4314 Clinical Application IV - Clinical Microbiology	0	6	2
___ Social Sciences Elective	3	0	3
	12	17	17
■ Eighth Term			
9303 Cooperative Employment	0	40	3
■ Ninth Term			
1020 Effective Speaking	3	0	3
4020 Fundamentals of Pathophysiology	5	0	5
4309 Medical Lab Seminar	5	0	5
___ Communication Skills Elective 3	3	0	3
___ Social Sciences Elective	3	0	3
	19	0	19
			111

General Electives
Communication Skills Elective 1 - 1001 or 1002
Communication Skills Elective 2 - if 1001 first: 1002, 1009
- if 1002 first: 1007, 1009
Communication Skills Elective 3 - 1020 or 1021
Communication Skills Elective 4 - 1010 or 1011

Social Sciences Electives
Group 1 - Psychology: 1505, 1506, 1021
Group 2 - Economics: 1512, 1513
Group 3 - Sociology: 1521, 1522
Group 4 - Community Relations: 1531, 1533, 1535, 1536, 1537
Three courses from at least two groups.

Medical Record Technology

An Accredited Record Technician is a skilled person, working in a medical record area, who has satisfactorily completed a national accreditation examination which is administered twice each year by the American Medical Record Association. Successful candidates are privileged to add the initials A.R.T. (Accredited Record Technician) to their names as proof of their high qualifications.

An Accredited Record Technician is employed in the medical record department of a hospital, clinic, nursing home, tumor registry, health maintenance organization, health agency, insurance company or vital statistics organization. The technician is responsible for many aspects of preparing, analyzing, and preserving health information needed by the patient, physician, hospital, public, etc. The Medical Record Technician's duties include the daily departmental admissions and discharge procedures. These procedures are preparing the patient's index card and record folder, computing the daily hospital census, preparing birth certificates, assembling the medical records, completing quantitative analysis and service analysis, coding and indexing diagnoses and operations, and assisting in research studies, peer group reviews and utilization reviews.

The College program is accredited by the American Medical Association's Committee on Allied Health Education, in collaboration with the American Medical Association. Graduates are eligible to take the National Accreditation Examination of the American Medical Record Association for the designation A.R.T. (Accredited Record Technician).

Students interested in entering the program should have a typing speed of more than 40 words per minute, and high school chemistry and biology courses as prerequisites.

Medical Record Technology Curriculum

Prerequisites: High school biology, chemistry & typewriting (40 wpm) or equivalent	Hours Per Week Class	Lab	Credit Hours
■ First Term			
*1001 Communication Skills I	3	0	3
4000 Medical Terminology	3	0	3
4001 Introduction to Health Care	2	0	2
4010 Human Biology	3	0	3
4401 Medical Record Science I	3	4	4
4208 Insurance & Patient Records	2	2	3
	16	6	18
■ Second Term			
9301 Cooperative Employment	1	40	2
■ Third Term			
*1002 Communication Skills II	3	0	3
4011 General Anatomy	2	3	3
4400 Medical Terminology & Transcription	3	10	6
4402 Medical Record Science II	3	2	4
4408 Advanced Medical Terminology	3	0	3
	14	15	19
■ Fourth Term			
9302 Cooperative Employment	1	40	2
■ Fifth Term			
1020 Effective Speaking	3	0	3
1021 Human Relations	3	0	3
4012 Human Physiology I	3	2	4
4403 Medical Record Science III	3	2	4
4411 MR Directed Practice I	0	12	2
___ Social Science Elective	3	0	3
	15	16	19
■ Sixth Term			
9303 Cooperative Employment	1	40	3
■ Seventh Term			
1850 Computer Business Application	3	2	4
4013 Human Physiology II	3	2	4
4404 Medical Record Science IV	3	0	3
4412 MR Directed Practice II	0	16	3
1010 Technical Writing	3	0	3
	12	20	17
■ Eighth Term			
9304 Cooperative Employment	1	40	3
■ Ninth Term			
4020 Fundamentals of Pathophysiology	5	0	5
4031 Health Care Management	3	0	3
4409 Medical Record Seminar	3	0	3
4413 MR Directed Practice III	0	12	2
___ Basic Elective	3	0	3
___ Social Science Elective	3	0	3
	17	12	19
■ Tenth Term			
9305 Cooperative Employment	1	40	3
			105

*With permission of coordinator and instructor, student may select another elective.

Communication Skills Elective 4 - 1010 or 1011

Social Sciences Electives
Group 1 - Psychology: 1505, 1506, 1021
Group 2 - Economics: 1512, 1513
Group 3 - Sociology: 1521, 1522
Group 4 - Community Relations: 1531, 1533, 1535, 1536, 1537
Three courses from at least two groups.

Basic Electives			
1150 Introduction to Science Mathematics	4	0	4
1701 Introduction to Data Processing & Programming	1	9	4
1711 Introduction to Data Management	4	6	6
1832 Personnel Management	3	0	3
2926 Principles of Management	3	0	3
3001 Typewriting I	2	3	3
3002 Typewriting II	2	3	3
3021 Office Procedures	3	0	3
4005 Chemistry for Health Technology	3	2	4
4009 General Microbiology	3	3	4
4017 Pharmacology	5	0	5
4105 Human Growth & Development	4	0	4
4131 Developmental Nutrition	4	0	4

Respiratory Therapy Technician/ Respiratory Therapist

The rapid growth of technology in the field of respiratory therapy, in addition to the increased awareness of diseases affecting the respiratory system, has resulted in a demand for trained personnel. This demand is for individuals with both the work experience and the educational background to competently and effectively carry out the many tasks of respiratory therapy under medical direction.

Graduates of these programs will be trained to administer gas therapy, humidity therapy, aerosol therapy, and intermittant positive pressure breathing treatments. They should be able to assist with long-term, continuous artificial ventilation and special diagnostic and therapeutic procedures. These individuals will also be capable of administering drugs which are given through inhalation procedures and will be able to perform tasks related to patient care, especially those of airway management, while involved in giving respiratory therapy. Both technician and therapist will be trained to clean, sterilize, and generally maintain respiratory therapy equipment. In addition, they must maintain adequate and accurate records of patient's therapy and other department records.

Respiratory Therapy Technician

The technician program is a one-year certificate program. Because of the nature of the structured experiences required by accreditation agencies, the student will spend one year in course work. The program does not include cooperative education.

Students interested in enrolling in this program should have courses in high school chemistry, biology, and algebra. Individuals currently employed in health care and who seek credential requirements are encouraged to apply.

The program is accredited by the American Medical Association's Committee on Allied Health Education in collaboration with the Joint Review Committee for Respiratory Therapy Education. Graduates of the program may apply for the certification examination administered by the National Board for Respiratory Therapy (NBRT). Candidates who complete the NBRT requirements are recognized as Certified Respiratory Therapy Technicians (CRTT).

Respiratory Therapy Technician Certificate Curriculum

Prerequisites: High school biology, algebra & chemistry or equivalent	Hours Per Week Class	Lab	Credit Hours
First Term			
4001 Introduction to Health Care	2	0	2
4005 Chemistry for Health Technology	3	2	4
4011 General Anatomy	2	3	3
4701 Respiratory Therapy Science I	3	0	3
4720 Cardiopulmonary Anatomy & Physiology	3	2	4
	13	7	16
Second Term			
1151 Science Mathematics I	5	0	4
4050 Patient Care Skills	0	2	1
4702 Respiratory Therapy Science II	2	3	3
4711 RT Clinical Practice I	0	10	2
4007 Emergency Procedures	1	2	2
	8	17	12
Third Term			
4009 General Microbiology	3	3	4
4703 Respiratory Therapy Science III	3	2	4
4712 RT Clinical Practice II	0	10	2
___ Communication Skills Elective 1	3	0	3
	9	15	13
Fourth Term			
2244 Allied Health Physics	3	2	3
4704 Respiratory Therapy Science IV	3	2	4
4713 RT Clinical Practice III	0	30	5
	6	34	12
Fifth Term			
4705 Respiratory Therapy Science V	3	2	4
4714 RT Clinical Practicum I	0	30	4
	3	32	8

Respiratory Therapist

The respiratory therapist is the second level in respiratory therapy education. This program is a continuation of the first year and grants an associate of applied science degree. Because of the nature of the clinical experiences, the program does not include cooperative education. Four terms are needed, in addition to the first year, to qualify for graduation.

Individuals who are interested should be a graduate of an accredited respiratory therapy technician program. Graduates of the therapist program may apply for the registry examination administered by the National Board for Respiratory Therapy (NBRT). Candidates who complete the NBRT requirements are recognized as Registered Respiratory Therapists (RRT).

Respiratory Therapy Technologist Second-Year Curriculum

Prerequisite: Graduation from an accredited Respiratory Therapy Technician program	Hours Per Week Class	Lab	Credit Hours
First Term			
4012 Human Physiology I	3	2	4
4017 Pharmacology	5	0	5
___ Communication Skills Elective 2	3	0	3
___ Social Sciences Elective	3	0	3
	14	2	15
Second Term			
4013 Human Physiology II	3	2	4
4020 Fundamentals of Pathophysiology	5	0	5
4706 Respiratory Therapy Science VI	3	2	4
___ Communication Skills Elective 3	3	0	3
	14	4	16
Third Term			
4707 Respiratory Therapy Science VII	3	0	3
4715 RT Clinical Practice IV	0	12	2
___ Communication Skills Elective 4	3	0	3
___ Social Sciences Elective	3	0	3
___ Social Sciences Elective	3	0	3
	12	12	14
Fourth Term			
4716 RT Clinical Practicum II	0	24	3
4721 Respiratory Supervision & Education	2	0	2
4723 Respiratory Therapy Seminar	1	2	2
	3	26	7
			52
Total First & Second Years			113

General Electives
Communication Skills Elective 1 - 1001 or 1002
Communication Skills Elective 2 - if 1001 first: 1002, 1009
- if 1002 first: 1007, 1009
Communication Skills Elective 3 - 1020 or 1021
Communication Skills Elective 4 - 1010 or 1011

Social Sciences Electives
Group 1 - Psychology: 1505, 1506, 1021
Group 2 - Economics: 1512, 1513
Group 3 - Sociology: 1521, 1522
Group 4 - Community Relations: 1531, 1533, 1535, 1536, 1537
Three courses from at least two groups.

Surgical Technology

The Surgical Technology program is designed to prepare the student in basic scrub functions directly assisting the surgeon during operative procedures. The Surgical Technologist also serves in various other capacities: preparation and care of sterile supplies and equipment, care of the surgical patient and assisting the registered nurse with circulating duties in the operative suite.

Graduate technologists are employed by hospitals and also by private surgeons.

The course of instruction includes introduction to basic operating room techniques utilizing a combination of lecture and laboratory sessions. Instruction in basic pathology is correlated with instruction in operative procedures in the areas of general surgery, gastrointestinal, gynecological, thoracic, vascular surgery and also other surgical specialties. Clinical experience and practice is incorporated throughout the curriculum. Sixteen area hospitals currently affiliate with the program. The final phase of the program is focused on the perioperative needs of the surgical patient.

The student has the option of pursuing a one-year certificate course of study or an associate of applied science degree. The degree option requires the student to successfully complete additional general education and technical courses. After completion of the studies required for the certificate program, students are eligible for the National Certification Examination of the Association of Surgical Technologists for designation as a Certified Surgical Technologist (C.S.T.)

The program begins annually in September. The program is accredited by the American Medical Association's Council on Allied Health Education and Accreditation in collaboration with the Joint Review Committee for the Surgical Technologist.

Students interested in entering the program should take basic chemistry and biology in high school or prior to entering the program. These courses are offered at the College.

Surgical Technology* Certificate Curriculum

Prerequisites: High school biology & chemistry or equivalent	Hours Per Week Class	Lab	Credit Hours
■ First Term			
4000 Medical Terminology	3	0	3
4001 Introduction to Health Care	2	0	2
4011 General Anatomy	2	3	3
4501 Introduction to Surgery	6	0	6
4511 ST Clinical Experience I	0	5	2
	13	8	16
■ Second Term			
4009 General Microbiology	3	3	4
4012 Human Physiology I	3	2	4
4502 Medical/Surgical Operative Procedures I	8	0	8
4512 ST Clinical Experience II	0	5	2
	14	10	18
■ Third Term			
4521 ST Clinical Practice I	1	40	7
■ Fourth Term			
4522 ST Clinical Practice II	1	40	7
■ Fifth Term			
4007 Emergency Procedures	1	2	2
4013 Human Physiology II	3	2	4
4503 Medical/Surgical Operative Procedures II	10	0	10
4513 ST Clinical Experience III	0	10	2
	14	14	18
			66

*Formerly known as Operating Room Technician program (ORT)

Surgical Technology Second-Year Curriculum

This option is available for students enrolled in the Surgical Technology program who choose to pursue an associate of applied science degree (AAS).

Students must complete the following "basic" courses:

4017 Pharmacology	5 credit hours
4020 Fundamentals of Pathophysiology	5 credit hours
4031 Health Care Management	3 credit hours

Students must complete 21 credit hours from the following courses. Three hours must be taken from each of the four Communication Skills Elective groups. Nine additional hours must be chosen from at least two of the Social Sciences Elective groups.

General Electives
Communication Skills Elective 1 - 1001 or 1002
Communication Skills Elective 2 - 1001 first: 1002, 1009
- if 1002 first: 1007, 1009
Communication Skills Elective 3 - 1020 or 1021
Communication Skills Elective 4 - 1010 or 1011

Social Sciences Elective
Group 1 - Psychology: 1505, 1506, 1021
Group 2 - Economics: 1512, 1513
Group 3 - Sociology: 1521, 1522
Group 4 - Community Relations: 1531, 1535, 1537

Students choosing the AAS option of the Surgical Technician program are encouraged to begin in the June Term.

Special Offerings in Health Technologies

Medical Transcriptionist

A Medical Transcriptionist is a person skilled in medical word processing.

Medical Transcriptionists are much in demand in the Medical Transcription or Central Dictation area of the medical records department in hospitals, clinics, physicians offices, neighborhood health centers, health departments, health maintenance organizations (HMO's), medical transcription companies, health insurance offices and medical research and teaching centers.

The Medical Transcriptionist is responsible for the prompt and accurate transcribing of history and physicals, x-ray reports, operative reports, pathology reports, consultations, discharge summaries and autopsies which become permanent records of medical, scientific and legal value. This individual is knowledgeable in anatomy and physiology and medical terminology used in medical and surgical procedures, drugs, instruments and laboratory tests, and possesses excellent typing, spelling and grammatical skills. A certificate is awarded upon successful completion of the program.

Students may complete the program at night or during the day. Selected courses may be offered on Saturdays. Those interested in entering the program should have a typing speed of more than 40 words per minute, high school chemistry and biology courses, or equivalent, as prerequisites. These courses are available at Cincinnati Technical College. All students will be given a typing placement test as part of these prerequisites.

Medical Transcriptionist Certificate Curriculum

Prerequisites: High school biology, chemistry & typewriting (more than 40 wpm)	Hours Per Week Class	Lab	Credit Hours
■ September Term			
4000 Medical Terminology	3	0	3
4011 General Anatomy	2	3	3
	5	2	6
■ November Term			
3002 Typewriting II	2	3	3
4012 Human Physiology I	3	2	4
	4	6	7
■ January Term			
1021 Human Relations	3	0	3
4012 Human Physiology II	3	2	4
	6	2	7
■ April Term			
1009 Business English	3	0	3
3055 Machine Transcription	1	4	2
	4	4	5
■ June Term			
4441 Medical Terminology & Transcription	2	5	4
			33
■ September Term			
4442 Medical Terminology & Transcription	2	5	4
			33

Basic Electrocardiography (#4290)

This thiry-hour course is an introduction to the standard twelve-lead electrocardiograph. The first ten hours cover basic anatomy and physiology of the heart. The remaining time includes topics such as how to take an EKG, mounting and filing records, handling distortion problems and special patients and troubleshooting. At least ten hours of practical experience in taking EKG's is included. A certificate is awarded to those students who receive a grade of "C" or better in the course.

Advanced Electrocardiography (#4291)

Emphasis is placed on recognizing cardiac arrhythmias in this thirty-hour course. Topics include a short review of cardiac anatomy and physiology, sinus and atrial arrhythmias, atrial and ventricular blocks, PVC's, etc. Practical experience in interpreting EKG strips is included. Basic EKG (#4290) or work experience with electrocardiography is strongly recommended as a prerequisite. A certificate is awarded to those students who receive a grade of "C" or better in the course.

Business Technologies Division

Business and industry are constantly searching for capable, responsible men and women identified as managers who can establish a working environment in which people work together in the most effective manner to achieve management goals. The number of managerial workers required by business is great and, especially in specialized business fields, growing each year. Sound business training helps to develop better management for American business enterprise and, ultimately, has a profound influence on the economic welfare of the nation.

The Cincinnati Technical College is meeting the need for specialized business training with eighteen technological programs. Organized job experience through cooperative work assignments with leading business firms is a key phase of the learning program in each of these eighteen business curricula. Collegiate level courses in these business areas combine with job-related activities during the alternating ten-week work terms to provide students with both business skills and business experience. Upon completion of the two-year work/study program in business, students receive an associate degree and begin advancing rapidly to more responsible and better paying mid-management positions.

Automotive Service Management Technology

The automotive industry employs more people and generates more income than any other industry in the nation. Increasing numbers of automobiles, generally increased complexity of design, and additional use of complex accessories all increase the number of people employed in automotive services. This increases employment opportunities for those personnel who work as service technicians and mid-managers.

Cincinnati Technical College students are instructed in automotive theory, procedures, and practices, as well as management techniques while in school. As co-ops on the job in automotive service departments, parts departments, service stations, etc., they receive practical experience under the direction of qualified technicians or experienced managers.

Graduates of the Automotive Service Management program, after the appropriate on-the-job work experience, could be promoted to work as service technicians, service advisors, assistant service managers, service managers, parts managers, service station managers, and other appropriate personnel in the automotive industry.

Automotive Service Management Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1120 Introduction to Business Mathematics	4	0	4
2501 Automotive Technology I	5	10	8
7102 Machine & Hand Tool Laboratory	1	4	3
	13	14	18
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
*1170 Introduction to Technical Mathematics	4	0	4
2221 Technical Physics I	3	2	3
2502 Automotive Technology II	5	10	8
	15	12	18
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
7005 Basic Blueprint Reading & Sketching	2	2	3
1505 Psychology of the Inner World of the Person	3	0	3
1512 Microeconomics	3	0	3
2222 Technical Physics II	5	0	3
2503 Automotive Technology III	2	8	4
2510 Automotive Management I	2	3	3
	17	13	19
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1010 Technical Writing	3	0	3
1513 Macroeconomics	3	0	3
1535 Labor Management Relations	3	0	3
2504 Automotive Technology IV	2	8	4
2511 Automotive Management II	2	3	3
7810 Welding Skills	3	3	3
	16	14	19

■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1020 Effective Speaking	3	0	3
1021 Human Relations	3	0	3
1823 Business Law I	3	0	3
2505 Automotive Technology V	5	10	8
	14	10	17
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			104

*A competency-based math test will be administered to all entering Business Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Business Data Management Technology

Today's business is a complex organization requiring workers with specialized talents and techniques to perform efficiently in a data processing department. With an increasing number of business establishments comes the need for trained personnel to assume managerial responsibilities in computer operations.

In the Business Data Management Technology at Cincinnati Technical College, students learn the principles of both management and data processing. Business Data Management is a particularly rewarding field of study because of the increasing demand for personnel who can administer data processing operations.

The Data Management coordinator uses input-output devices, job control decks, console commands, processing programs, utility programs and operating systems. Data Management personnel in business data processing identify with company policy and work with the top management and non-supervisory employees.

Job opportunities available to graduates of the Business Data Management curriculum include the following: data entry supervisor, supervisor computer operations, computer operator, computer peripheral equipment operator and peripheral equipment operator.

Business Data Management Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1140 Introduction to Linear Algebra	4	0	4
1711 Introduction to Data Management & Computer Operations	4	6	6
1712 Data Entry Systems	2	3	3
2911 Principles of Accounting I	3	2	3
	16	11	19
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1141 Matrix Algebra	4	0	4
1731 Peripheral Equipment Operations	3	7	5
2912 Principles of Accounting II	3	2	3
2926 Principles of Management	3	0	3
	16	9	18
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1142 Probability & Introduction to Quantitative Analysis OR			
**___ Elective	4	0	4
1721 Programming Logic & Methods	2	3	3
1740 Operating Systems	4	6	7
2913 Principles of Accounting III	3	2	3
**___ Social Sciences Elective	3	0	3
	16	11	20
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1010 Technical Writing	3	0	3
1512 Microeconomics	3	0	3
1742 COBOL Programming I	3	7	6
1832 Personnel Management	3	0	3
2925 Business Principles	3	0	3
	15	7	18
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1020 Effective Speaking	3	0	3
1021 Human Relations	3	0	3
1761 Introduction to RPG II	3	7	6
1741 Operating Systems II	2	3	3
1783 Research Project OR	2	3	3
2921 Managerial Accounting	2	3	3
	13	13	18
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			106

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**Elective subject to approval of program coordinator

Business Data Processing Technology

The objective of the Business Data Processing program at Cincinnati Technical College is to provide the student with the technical training necessary to function effectively as a computer programmer/analyst and to make a significant contribution to the co-op employer during training and to the data processing community after graduation.

Data processing is an essential part of every business. Its function is to collect, control and process the data necessary to provide management with meaningful information which is useful input to the management decision-making process. This task has become more significant over the past few years due to the volume of data now available and essential to business. Thus, computers are now used extensively in data processing to perform tasks previously accomplished by clerks, statisticians and even management personnel.

The introduction and eventual sophistication of data processing equipment has created a continuous need for professional Data Processing technicians, especially computer programmers.

A computer programmer, the vital link between the computer and the systems analyst, instructs the computer to perform various tasks based on the requirements set down by the systems analyst. Assignments range from simple (listing a set of punched cards on a printing devise) to complex (developing a complete set of programs to prepare employee time records, payroll checks, payroll check reconciliation reports, quarterly FICA and Withholding Tax Reports, W-2 Forms and labor-cost distribution reports).

Business Data Processing Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1140 Introduction to Linear Algebra	4	0	4
1701 Introduction to Data Processing & Programming	1	9	4
1721 Programming Logic & Methods	2	3	3
2911 Principles of Accounting I	3	2	3
	13	14	17
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
*1141 Matrix Algebra	4	0	4
1722 Basic & Assembly Programming	2	3	3
1761 Introduction to RPG II	3	7	6
2912 Principles of Accounting II	3	2	3
	15	12	19
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1142 Probability & Introduction to Quantitative Analysis OR			
**___ Elective	4	0	4
1512 Microeconomics	3	0	3
1742 COBOL Programming I	3	7	6
1781 Advanced RPG II	2	3	3
2913 Principles of Accounting III	3	2	3
	15	12	19
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1010 Technical Writing	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
1762 COBOL Programming II	4	6	6
1763 Systems Analysis & Design	3	7	5
	13	13	17
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1020 Effective Speaking	3	0	3
1739 Operating Systems	2	3	3
1752 Real Time Systems & Data Communications	2	3	3
1782 Installation Management	3	0	3
1783 Research Project	2	3	3
**___ Social Sciences Elective	3	0	3
	15	9	18
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			103

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**Elective subject to approval of program coordinator.

Business Management Technology

A combination of business training and business experience prepares students for many opportunities in the world of business. The CTC Business Management program provides the technical skills and knowledge so valuable to business and industry.

Business Management students meet with instructors experienced in office organization, personnel procedures, management, finance, sales, accounting and related subjects. Learning experiences are provided by a program of field trips, guest lecturers with special expertise, case studies and modern visual presentation techniques.

The technical business training in this program lends itself to a wide variety of positions, often leading to promotional opportunities in credit, finance, personnel, purchasing, public relations, inventories, distribution and other areas of business management.

While engaged in their cooperative work, Business Management students participate in employment training positions in banking, insurance, retailing and other important fields. Many of Cincinnati's leading firms offer training positions for students which may lead to more responsible and challenging future assignments.

There are also opportunities to own and operate a business enterprise. Success in such a venture requires an understanding of the business skills offered through the Business Management program at Cincinnati Technical College.

Business Management Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1121 Business Mathematics	4	0	4
2901 Principles of Marketing I	3	0	3
2911 Principles of Accounting I	3	2	3
2925 Business Principles	3	0	3
3005 Administrative Typewriting	2	3	3
	18	5	19
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1122 Financial Analysis	4	0	4
1512 Microeconomics	3	0	3
1810 Principles of Salesmanship	3	0	3
2902 Principles of Marketing II	3	0	3
2912 Principles of Accounting II	3	2	3
	19	2	19
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1007 Research & Logic	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
1850 Computerized Business Applications	2	3	3
2905 Money & Banking	3	0	3
2913 Principles of Accounting III	3	2	3
2926 Principles of Management	3	0	3
	17	5	18
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1011 Business Communications	3	0	3
1804 Risk & Insurance	3	0	3
1823 Business Law I	3	0	3
1832 Personnel Management	3	0	3
1851 Auditing	4	1	4
2960 Principles of Finance	3	0	3
	19	1	19
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3

■ Fifth School Term (April & June)			
1020 Effective Speaking	3	0	3
1521 Introduction to Sociology	3	0	3
1824 Business Law II	3	0	3
2904 Office Management	3	0	3
2906 Credits & Collections	3	0	3
2917 Federal Taxation I	2	3	3
	17	3	18
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			106

*A competency-based math test will be administered to all entering Business Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Executive Chef Technology

The food service industry, one of the country's largest in both dollar sales and number of people employed, is also one of the fastest growing industries. Continued growth is assured with the expansion of hospitality facilities.

The industry has a great need for trained cooks, chefs and other related food service personnel. But the most serious aspect of this need is the shortage of qualified chefs. At crisis proportion now, increased demands estimate that at least 40,000 qualified chefs will be required each year for the next ten years. CTC's Executive Chef program was designed to answer this growing need.

Executive Chef students are given the opportunity to participate in CTC's cooperative education program. Every other term students can obtain valuable experience by working in a food service facility to learn firsthand about their chosen career. Besides being a worthwhile training opportunity, the co-op program provides paid employment for the student.

In addition to this associate degree program, CTC offers a U.S. Labor Department chef's apprenticeship program. This training is endorsed by the Les Chefs de Cuisine of Greater Cincinnati and the American Culinary Federation. It includes both practical training and classroom instruction and can be completed on a part or full-time basis.

The similarity in course content for the degree and apprenticeship programs permits students the flexibility to be enrolled in both training experiences. Graduates would then receive an associate degree and would have completed the required national standards for journeymen chefs.

Executive Chef Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
1120 Introduction to Business Mathematics	4	0	4
2801 Introduction to Restaurant Management	2	4	3
**2806 Beverage Management	2	1	2
2822 Fundamentals of Food Preparation I	2	4	3
2911 Principles of Accounting I	3	2	3
	16	11	18
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
*1121 Business Mathematics	4	0	4
1823 Business Law I	3	0	3
2802 Restaurant Management II	2	4	3
2823 Food Preparation II	2	4	3
2912 Principles of Accounting II	3	2	3
	17	10	19
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1020 Effective Speaking	3	0	3
**1234 OSHA I	3	0	3
2803 Restaurant Management III	2	4	3
2824 Food Preparation III	2	4	3
2928 Hotel-Motel Accounting	3	0	3
4130 Introduction to Nutrition	3	0	3
	16	8	18
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1021 Human Relations	3	0	3
1512 Microeconomics	3	0	3
1535 Labor Management Relations	3	0	3
1824 Business Law II	3	0	3
2804 Restaurant Management IV	3	0	3
2825 Food Preparation IV	2	6	3
	17	6	18
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1011 Business Communications	3	0	3
1521 Introduction to Sociology	3	0	3
**2805 Restaurant Management V	3	0	3
2815 Hotel-Motel Management V	3	0	3
2821 Sales Techniques	2	0	2
2826 Food Preparation V	2	6	3
	16	6	17
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			103

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**Can substitute with technical elective approved by coordinator.

Graphic Communications Technology

The influence of printing radiates through all the fields of endeavor known to Man. The printed word is necessary to sustain civilization and to support social, educational, technological and commercial growth. As society becomes more complex, communication via printing becomes increasingly important.

At Cincinnati Technical College, modern computerized typesetting equipment, letterpress and offset presses, excellent ancillary equipment and expert instruction combine to provide a quality graphic arts program.

Although each Graphic Communications student studies all of the major modern graphic arts processes, the scope of the program is not limited to the development of craftsmanship. Technicians in a dynamic, growing industry constantly address themselves to new problems. The Graphic Communications program provides the scientific and technical knowledge necessary to resolve those problems.

As important as they are, craftsmanship and scientific-technical knowledge do not fully describe the Graphic Communications program. The graphic arts industry urgently requires mid-management personnel. Courses in human behavior, effective speaking, business law, etc., provide the management skills necessary for mid-management positions in shop leadership, estimating, production planning and cost control.

Graphic Communications Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
1449 Estimating Preparation	2	3	3
1401 Layout and Design	2	0	2
1402 Typography	2	6	4
1415 Graphic Arts Processes	3	2	3
1512 Microeconomics	3	0	3
	15	11	18
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1405 Proofreading and Copy Preparation	2	0	2
1410 Machine Composition & Newspaper Designing	1	9	4
1460 Bindery Method/Procedures	2	3	3
1513 Macroeconomics	3	0	3
2261 Printing Science I (Chemistry)	3	2	3
	14	14	18
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1020 Effective Speaking	3	0	3
1450 Estimating	2	3	3
1421 Cold Type Process	1	9	4
1021 Human Relations	3	0	3
1810 Principles of Salesmanship	3	0	3
2262 Printing Science II (Physics)	3	2	3
	15	14	19
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1007 Research and Logic	3	0	3
1419 Survey of Printing Inks	3	0	3
1430 Presswork	1	9	4
1480 Photolithography I	2	3	3
1823 Business Law I	3	0	3
2909 Office Accounting I	3	2	3
	15	14	19
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1010 Technical Writing	3	0	3
1428 Management Survey	3	0	3
1440 Offset Press Operation	2	13	6
1481 Photolithography II	2	3	3
1521 Introduction to Sociology	3	0	3
	13	16	18
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			105

Hotel-Motel-Restaurant Management Technology

Increased leisure, a higher living standard and improved transportation have caused the demand for the services of the hospitality industry to spiral. Motel, hotel and restaurant chains have responded with large scale expansion programs. As a result, the industry is experiencing a shortage of qualified personnel, particularly at the mid-management level. At present, the employment estimates indicate a conservative need for at least 100,000 supervisory employees new to the industry each year just to satisfy the demands of existing properties. Added to this total is another large number of supervisory employees to reflect the needs of the many new properties, rooms and restaurants currently being planned and constructed. Cincinnati Technical College is prepared to meet the employment needs of this industry locally through its Hotel-Motel-Restaurant Management program.

Today's modern hotel or restaurant managers must have a comprehensive knowledge of all the departments and operations in their institutions. CTC's Hotel-Motel-Restaurant program provides all phases of this training from front office procedures to mass food preparation to maintenance problems.

Graduates of this technology are found in various job positions: front office manager, superintendent of service, assistant or executive housekeeper, steward, dining room manager, assistant restaurant manager, assistant catering manager or assistant hotel manager.

H-M-R students are involved in the hospitality industry early in their academic careers. Paid cooperative work experience gives students the opportunity to see the industry in operation and to set their goals on the type of career they wish to follow within the industry. Hotels, motels and restaurants throughout the Greater Cincinnati area provide co-op employment for CTC students.

Hotel-Motel-Restaurant Management Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1120 Introduction to Business Mathematics	4	0	4
2801 Introduction to Restaurant Management	2	4	3
**2806 Beverage Management	2	1	2
**2811 Hotel-Motel Management I	3	0	3
2911 Principles of Accounting I	3	2	3
	17	7	18
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1121 Business Mathematics	4	0	4
1823 Business Law I	3	0	3
2802 Restaurant Management II	2	4	3
2812 Hotel-Motel Management II	3	0	3
2912 Principles of Accounting II	3	2	3
	18	6	19
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1020 Effective Speaking	3	0	3
2803 Restaurant Management III	2	4	3
2813 Hotel-Motel Management III	3	0	3
**2928 Hotel-Motel Accounting	3	0	3
2929 Audit Procedures	3	0	3
4130 Introduction to Nutrition	3	0	3
	17	4	18
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1021 Human Relations	3	0	3
1512 Microeconomics	3	0	3
1535 Labor Management Relations	3	0	3
1824 Business Law II	3	0	3
2804 Restaurant Management IV	3	0	3
2814 Hotel-Motel Management IV	3	0	3
	18	0	18

■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1011 Business Communications	3	0	3
1521 Introduction to Sociology	3	0	3
2805 Restaurant Management V	3	0	3
2815 Hotel-Motel Management V	3	0	3
2821 Sales Techniques	2	0	2
**2930 Hotel-Motel Case Studies	3	0	3
	17	0	17
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			103

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**Can substitute with technical electives approved by coordinator.

Loss Control - Security Technology

Business and industry throughout the country are facing serious losses due to theft and pilferage and, the greatest concern of all, employee crime. Not only do these losses affect business owners but they produce long-term effects — higher costs — to each person who consumes these goods.

To help fight this situation business owners are turning to trained specialists in the security field to join the management team. However, the demand for security personnel is much greater than the supply. In short, there are far more jobs than there are trained security specialists.

Cincinnati Technical College offers a security administration program, one of the first associate degree programs in the country, to meet this demand. The Loss Control program curriculum was developed in collaboration with the Tri-State Chapter of the American Society for Industrial Security. Although other institutions offer law enforcement and police science programs, CTC provides the classroom instruction and practical training requirements of the private security practitioner.

Students in the Loss Control program receive supervised on-the-job experience through the College's co-op program, and, because of the nature of their work schedules, can follow classes during the day or evening.

Graduates of this program are found in public agencies, private business and industry and in government divisions providing specialized security services for their employers.

Loss Control Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term			
*1120 Introduction to Business Mathematics	4	0	4
1201 Private Police Officer's Training Course	4	8	8
1001 Communication Skills I	3	0	3
1210 Introduction to Loss Control & Security Administration	3	0	3
2926 Principles of Management	3	0	3
	17	8	21
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term			
1002 Communication Skills II	3	0	3
*1121 Business Mathematics	4	0	4
**1220 Fundamentals of Fire Protection	3	0	3
**1211 Industrial Security	3	0	3
1216 Security Administration I	3	0	3
2927 Security Management	3	0	3
	19	0	19
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term			
1020 Effective Speaking	3	0	3
1823 Business Law I	3	0	3
1217 Security Administration II	3	0	3
1010 Technical Writing	3	0	3
1204 Personnel Security Systems	2	3	3
2909 Office Accounting I	3	2	3
	17	5	18
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term			
1205 Criminal Interrogation	3	0	3
1021 Human Relations	3	0	3
1230 Safety Management	3	0	3
1208 Criminal Law I	4	0	4
**1233 Emergency Planning	3	0	3
1535 Labor Management Relations	3	0	3
	19	0	19
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term			
1209 Criminal Law II	4	0	4
1224 Fundamentals of Fire Prevention	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
01240 Directed Case Study	3	0	3
1521 Introduction to Sociology	3	0	3
	16	0	16
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			106

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**Can substitute with technical electives approved by coordinator.

Managerial Accounting Technology

Managerial Accounting is especially designed to develop those individuals who have a high degree of inherent skill in accounting. The technical skills and the additional knowledge of business fundamentals provide the graduate with a thorough understanding of accounting systems and how these systems are applied in business (small and large) and industrial organizations. In addition, the program gives an indepth view into the design, maintenance and utilization of a financial system.

Cincinnati Technical College, through the Managerial Accounting program, prepares students for careers in a variety of business and industrial positions. Principal among these are positions in the field of accounting, such as junior accountants, cost accountants, payroll, finance accounting clerks, cost estimators and other specialized accounting assignments. There are many other specialized job opportunities related to the Managerial Accounting field that are available to the well-trained student.

Opportunities are provided to demonstrate, expand or refine competencies required for potential mid-management employment.

Managerial Accounting Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1121 Business Mathematics	4	0	4
1505 Psychology of the Inner World of the Person	3	0	3
2911 Principles of Accounting I	3	2	3
2925 Business Principles	3	0	3
3005 Administrative Typewriting	2	3	3
	18	5	19
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1122 Financial Analysis	4	0	4
1512 Microeconomics	3	0	3
1521 Introduction to Sociology	3	0	3
2901 Principles of Marketing I	3	0	3
2912 Principles of Accounting II	3	2	3
	19	2	19
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1007 Research & Logic	3	0	3
1804 Risk & Insurance	3	0	3
2905 Money & Banking	3	0	3
2913 Principles of Accounting III	3	2	3
2917 Federal Taxation I	2	3	3
2926 Principles of Management	3	0	3
	17	5	18
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1011 Business Communications	3	0	3
2920 Intermediate Accounting I	2	3	3
1823 Business Law I	3	0	3
1851 Auditing	4	1	4
2914 Cost Accounting I	3	2	3
2918 Federal Taxation II	2	3	3
	17	9	19
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1020 Effective Speaking	3	0	3
1824 Business Law II	3	0	3
1852 EDP & Auditing	2	3	3
2904 Office Management	3	0	3
2915 Cost Accounting II	3	2	3
2920 Intermediate Accounting II	2	3	3
	16	8	18
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			106

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Ornamental Horticulture Technology

The beauty of a rose. The loveliness of the green expanse of a park. The majesty of an oak that shelters a home. How great a pleasure it is to admire these gifts of nature in an age of steel, concrete and glass, especially at a time of great concern for the environment.

Urban area residents are indebted to those who work with nature to produce these pleasures. Many of the flowers, trees, shrubs and lawns that adorn the city are their handiwork. They are the men and women of the Ornamental Horticulture industry. They include landscapers, nurserymen, greenskeepers, and florists.

Theirs is — literally and figuratively — a growth industry in which career opportunities are excellent for aspiring "green thumb technicians." These opportunities offer special satisfactions to those who like the elbow room of the out-of-doors, who like to work with nature but live in the city. Students may elect to specialize in either ornamental horticulture or floriculture during their 4th, 5th, or 6th terms.

The Ornamental Horticulture Technology program is designed to prepare high school graduates, exhibiting the necessary interests and aptitudes, to work for a wide range of employers: garden stores, nurseries, golf courses, parks, private estates, florists, and others who grow, sell, install or maintain flowers, turf, trees, shrubs and gardens.

Because of the unique seasonal employment requirements of horticulturally related jobs, this program does not follow the usual CTC schedule of alternating in-college and on-the-job quarters. Instead, students will spend two successive terms (during the growing season) in cooperative employment during each of the two years they are enrolled in the program. The purpose of this arrangement is to maximize the learning and earning opportunities of horticulture students during the peak of the propagation, cultivation and selling season.

Ornamental Horticulture Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September)			
1001 Communication Skills I	3	0	3
1170 Introduction to Technical Mathematics	4	0	4
3502 Horticulture Science I	3	1	3
3505 Herbaceous Plant Materials	3	0	3
3504 Woody Plant Materials I	2	3	3
3500 Orientation to Horticulture Occupations	1	0	1
	16	4	17
■ Second School Term (November)			
1002 Communication Skills II	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
1521 Introduction to Sociology	3	0	3
2209 Technical Chemistry Survey	3	2	4
3525 Plant Propagation	2	3	3
	14	5	16
■ Third School Term (January)			
1021 Human Relations	3	0	3
3501 Soils and Plant Nutrition	3	0	3
3509 Principles of Landscape Design	2	4	3
3528 Greenhouse Management	3	0	3
3510 Horticultural & Turf Equipment	2	3	3
3530 Horticulture Seminar I	1	1	1
	14	8	16
■ First Co-op Term (April)			
9501 Cooperative Employment	3	40	2
■ Second Co-op Term (June)			
9502 Cooperative Employment	1	40	2
■ Fourth School Term (September)			
1020 Effective Speaking	3	0	3
2925 Business Principles	3	0	3
3521 Diseases and Insects	3	1	3
3508 Turfgrass Management	2	3	3
3518 Advanced Landscape Design	2	4	3
	13	8	15

■ Fifth School Term (November)			
1832 Personnel Management	3	0	3
2909 Office Accounting I	2	3	3
3506 Nursery Management	2	3	3
3532 Landscape Maintenance	2	3	3
3511 Landscape Construction	2	4	3
3515 Woody Plant Materials II	2	3	3
	13	16	18
■ Sixth School Term (January)			
1010 Technical Writing	3	0	3
1810 Principles of Salesmanship	3	0	3
3519 Landscape Contracts & Specifications	3	0	3
3507 Aboriculture	3	0	3
3534 Foliage Plants	3	0	3
3531 Horticulture Seminar II	1	1	1
	16	1	16
■ Third Co-op Term (April)			
9503 Cooperative Employment	1	40	3
■ Fourth Co-op Term (June)			
9504 Cooperative Employment	1	40	3
			108

Ornamental Horticulture/Floriculture Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September)			
1001 Communication Skills I	3	0	3
*1170 Introduction to Technical Mathematics	4	0	4
3502 Horticulture Science I	3	1	3
3505 Herbaceous Plant Materials	3	0	3
3504 Woody Plant Materials I	2	3	3
3500 Orientation to Horticulture Occupations	1	0	1
	16	4	17
■ Second School Term (November)			
1002 Communication Skills II	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
1521 Introduction to Sociology	3	0	3
2209 Technical Chemistry Survey	3	2	4
3525 Plant Propagation	2	3	3
	14	5	16
■ Third School Term (Janauary)			
1021 Human Relations	3	0	3
3501 Soils and Plant Nutrition	3	0	3
3509 Principles of Landscape Design	2	4	3
3528 Greenhouse Management	3	0	3
3510 Horticultural & Turf Equipment	2	3	3
3530 Horticulture Seminar I	1	1	1
	14	8	16
■ First Co-op Term (April)			
9501 Cooperative Employment	3	40	2
■ Second Co-op Term (June)			
9502 Cooperative Employment	1	40	2
■ Fourth School Term (September)			
1020 Effective Speaking	3	0	3
2925 Business Principles	3	0	3
3521 Diseases & Insects	3	1	3
3541 Floriculture Production I	2	3	3
3540 Introduction to Floral Design	2	3	3
	13	7	15
■ Fifth School Term (November)			
1832 Personnel Management	3	0	3
2909 Office Accounting I	2	3	3
3542 Retail Florist Management	2	4	3
3543 Floriculture Production II	2	3	3
3532 Landscape Maintenance	2	3	3
	11	13	15
■ Sixth School Term (Janaury)			
1010 Technical Writing	3	0	3
1810 Principles of Salesmanship	3	0	3
3534 Foliage Plants	3	0	3
3544 Advanced Floral Design	2	3	3
3545 Floriculture Production III	2	3	3
3531 Horticulture Seminar II	1	1	1
	14	7	16
■ Third Co-op Term (April)			
9503 Cooperative Employment	1	40	3
■ Fourth Co-op Term (June)			
9504 Cooperative Employment	1	40	3
			105

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Property Management Technology

The dynamic growth in the construction of apartment complexes, office structures, industrial parks and shopping centers has accelerated the demand for professionally trained property managers. An effective property manager must have the ability to properly supervise maintenance, office and accounting functions, handle tenant relations, prepare and implement management plans and operating budgets. The successful fulfillment of the functions determines whether a property is a valuable entity to the owner, tenant, resident and community. Men and women who assume responsibilities as property managers are well compensated. Property Management experience provides an excellent background to all other specialties in the real estate profession.

Cincinnati Technical College is the nation's first institution of higher learning to offer an associate degree program in Property Management. A part of CTC's Real Estate Academy, the program curriculum is based upon class discussion, case studies, publications of the Institute of Real Estate Management and National Association of Realtors. The course work covers the resident manager through executive property manager positions.

Students receive instruction from Certified Property Managers (C.P.M.'s) who also counsel the College on the latest principles and practices employed in the Property Management field. Five of the program's technical courses (2931, 2932, 2933, 2934 and 2935) are offered only in the evening. In addition to the coursework in property management, the curriculum includes the required courses for students who wish to sit for a real estate license.

The program provides excellent cooperative employment opportunities with leading property managers and institutional owners in the Cincinnati area.

Property Management Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1120 Introduction to Business Mathematics	4	0	4
1512 Microeconomics	3	0	3
2925 Business Principles	3	0	3
2931 On-Site Property Management I	3	1	3
2951 Real Estate Principles & Practices	3	0	3
	19	1	19

■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1121 Business Mathematics	4	0	4
1513 Macroeconomics	3	0	3
2932 On-Site Property Management II	3	1	3
2953 Real Estate Law	3	0	3
	16	1	16
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1020 Effective Speaking	3	0	3
**2905 Money & Banking	3	0	3
2911 Principles of Accounting I	3	2	3
2933 Executive Level Property Management I	3	1	3
2952 Real Estate Brokerage	3	0	3
2954 Real Estate Finance	3	0	3
	18	3	18
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1007 Research & Logic	3	0	3
1021 Human Relations	3	0	3
2912 Principles of Accounting II	3	2	3
**2926 Principles of Management	3	0	3
2934 Executive Level Property Management II	3	1	3
2955 Real Estate Appraisal I - Residential	3	0	3
	18	3	18
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1011 Business Communications	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
**1832 Personnel Management	3	0	3
2917 Federal Taxation I	2	3	3
2935 Property Management Case Study	3	0	3
2957 Real Estate Seminar: Special Topics	3	0	3
	17	3	18
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			102

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**Can be substituted with technical electives approved by coordinator.

Real Estate Technology

Real estate is one of the most stable of all career areas. Real estate sales and related real estate specialties offer unlimited opportunities for men and women to provide a valuable service to buyers and sellers of real property and to be well compensated for their efforts.

To help students and professionals with their career development, Cincinnati Technical College has instituted the Real Estate Academy. The Academy, directed and coordinated by a licensed real estate broker, provides the training to meet career objectives.

Students may elect to follow a sequenced, six-course certificate program which meets all the requirements to qualify one for the Ohio Real Estate Sales Associate and Broker's license examinations.

The two-year associate degree program curriculum includes all of the required courses for a real estate license and the Ohio Association of Realtors' GRI designation. Students may combine this two-year program with certain property management courses to earn an associate degree with a double major in Real Estate and Property Management. Students also may supplement their associate degree curriculum with technical electives in areas which will enhance their professional aspirations.

For those real estate professionals who wish to advance their skills, the Real Estate Academy will be providing special continuing education credit courses throughout the year as demand warrants their scheduling.

Real Estate Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1120 Introduction to Business Mathematics	4	0	4
1512 Microeconomics	3	0	3
2925 Business Principles	3	0	3
2951 Real Estate Principles & Practices	3	0	3
2953 Real Estate Law	3	0	3
	19	0	19
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1121 Business Mathematics	4	0	4
1513 Macroeconomics	3	0	3
2940 Real Estate Sales	3	0	3
2954 Real Estate Finance	3	0	3
	16	0	16
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1020 Effective Speaking	3	0	3
1804 Risk & Insurance	3	0	3
**2901 Principles of Marketing I	3	0	3
**2905 Money & Banking	3	0	3
2911 Principles of Accounting I	3	2	3
2952 Real Estate Brokerage	3	0	3
	18	2	18
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1007 Research & Logic	3	0	3
1021 Human Relations	3	0	3
**2902 Principles of Marketing II	3	0	3
2912 Principles of Accounting II	3	2	3
2926 Principles of Management	3	0	3
2955 Real Estate Appraisal I - Residential	3	0	3
	18	2	18
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1011 Business Communications	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
**1842 Advertising & Display	3	2	4
2917 Federal Taxation I	2	3	3
2956 Real Estate Appraisal II - Income Producing Property	3	0	3
2957 Real Estate Seminar: Special Topics	3	0	3
	17	5	19

■ **Fifth Co-op Term**				
9205	Cooperative Employment	4	40	3
				103

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**Can be substituted with technical elective approved by coordiantor.

Safety/Risk Management Technology

Because of federal and state regulations, employees' activism and consumer demands, business and industry are allocating more monies for occupational hazard control. To insure compliance with these regulations, companies are hiring safety specialists to act as the direct link between top management and the work force. The demand for these technicians is so great that presently there are more jobs than students pursuing this career.

Students in CTC's Safety/Risk Management program are provided instruction in the detection of unsafe conditions and practices and the development of job training programs. Not only do students learn the techniques of human relations, but they are taught the fundamentals of accident prevention as well as federal regulations including The Occupational Safety and Health Act and National Fire Prevention Codes.

Many CTC students combine this program with the Loss Control program for a double major, since industry tends to combine these specialists in one position. The Safety/Risk program allows students to take technical electives in specialized areas such as those found in other Business programs or Engineering Technologies programs.

Safety/Risk Management Technology Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ **First School Term**				
*1120	Introduction to Business Mathematics	4	0	4
1202	First Aid	3	0	3
**1236	Vehicle Safety	3	0	3
1001	Communication Skills I	3	0	3
2926	Principles of Management	3	0	3
**1237	Safety Training Methods	1	3	3
		17	3	19
■ **First Co-op Term**				
9201	Cooperative Employment	3	40	2
■ **Second School Term**				
1002	Communication Skills II	3	0	3
1121	Business Mathematics	4	0	4
**1220	Fundamentals of Fire Protection	3	0	3
1211	Industrial Security	3	0	3
1234	OSHA I	3	0	3
2927	Security Management	3	0	3
		19	0	19
■ **Second Co-op Term**				
9202	Cooperative Employment	3	40	2
■ **Third School Term**				
1020	Effective Speaking	3	0	3
1823	Business Law I	3	0	3
1235	OSHA II	3	0	3
1010	Technical Writing	3	0	3
1204	Personnel Security Systems	2	3	3
2909	Office Accounting I	3	2	3
		17	5	18
■ **Third Co-op Term**				
9203	Cooperative Employment	4	40	3
■ **Fourth School Term**				
1205	Criminal Interrogation	3	0	3
1021	Human Relations	3	0	3
1230	Safety Management	3	0	3
2000	Industrial Hygiene Recognition	3	1	3
1233	Emergency Planning	3	0	3
1535	Labor Management Relations	3	0	3
		18	1	18
■ **Fourth Co-op Term**				
9204	Cooperative Employment	4	40	3
■ **Fifth School Term**				
2010	Industrial Hygiene Measurements	2	3	3
**1224	Fundamentals of Fire Prevention	3	0	3
1505	Psychology of the Inner World of the Person	3	0	3
2011	Industrial Hygiene Control	3	1	3
1521	Introduction to Sociology	3	0	3
		14	4	15
■ **Fifth Co-op Term**				
9205	Cooperative Employment	4	40	3
				102

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**Can substitute with technical electives approved by coordinator.

Sales Marketing Technology/ Industrial Sales Marketing Technology

In the Sales Marketing program at Cincinnati Technical College, small classes, expert guidance, instruction and coordination all focus on a single objective: developing talent for the sales marketing professions. Advertising, display, retailing, wholesaling, mid-management supervision, data processing, accounting and other studies develop the attitudes and skills necessary for success.

To further meet the needs of the business community and students, this program offers the option of Industrial Sales Marketing. This option focuses on selling at the professional level by the manufacturer's representative and by the wholesale salesman who are primarily concerned with characteristics of the industrial market, purchasing agents, the product and services.

The business/industrial community in Cincinnati provides a unique laboratory in which Sales Marketing students acquire their cooperative employment experience. Greater Cincinnati is such a diverse marketing complex that this area is used by many national agencies for market research. The kinds of cooperative employment presently held by Sales Marketing students are as varied as the marketing area itself.

On-the-job training is not a substitute for the critical analysis and careful exposition undertaken in school; nor is classroom work a substitute for field experience. The Cincinnati Technical College cooperative employment system offers both in the proper proportions for optimum personal and professional growth.

Sales Marketing Technology Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ **First School Term (September & November)**				
1020	Effective Speaking	3	0	3
*1120	Introduction to Business Mathematics	4	0	4
1810	Principles of Salesmanship	3	0	3
1845	Principles of Retailing	3	0	3
2925	Business Principles	3	0	3
		16	0	16

■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1001 Communication Skills I	3	0	3
1121 Business Mathematics	4	0	4
1836 Principles of Wholesaling	3	0	3
2926 Principles of Management	3	0	3
3005 Administrative Typewriting	2	3	3
	15	3	16
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1002 Communication Skills II	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
1521 Introduction to Sociology	3	0	3
1799 Survey of Data Processing	4	1	4
1832 Personnel Management	3	0	3
2901 Principles of Marketing I	3	0	3
	19	1	19
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1007 Research and Logic	3	0	3
1512 Microeconomics	3	0	3
1815 Audiovisual Sales Techniques	3	2	4
1823 Business Law I	3	0	3
2902 Principles of Marketing II	3	0	3
2911 Principles of Accounting I	3	2	3
	18	4	19
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1011 Business Communications	3	0	3
1840 Retail Merchandising & Operations	4	0	4
1824 Business Law II	3	0	3
1842 Advertising and Display	3	2	4
2912 Principles of Accounting II	3	2	3
1804 Risk and Insurance	3	0	3
	19	4	20
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			103

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Industrial Sales Marketing Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1020 Effective Speaking	3	0	3
*1120 Introduction to Business Mathematics	4	0	4
1846 Industrial Product Marketing I	4	0	4
1810 Introduction to Salesmanship	3	0	3
2925 Business Principles	3	0	3
	17	0	17
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1001 Communication Skills I	3	0	3
1121 Business Mathematics	4	0	4
1813 Industrial Sales	4	0	4
1847 Industrial Product Marketing II	4	0	4
3005 Administrative Typewriting	2	3	3
2926 Principles of Management	3	0	3
	20	3	21
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1002 Communication Skills II	3	0	3
1505 Psychology of the Inner World of the Person	3	0	3
1799 Survey of Data Processing	4	1	4
1817 Industrial Purchasing	4	0	4
1521 Introduction to Sociology	3	0	3
	17	1	17
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1007 Research and Logic	3	0	3
1512 Microeconomics	3	0	3
1815 Audiovisual Sales Techniques	3	2	4
2911 Principles of Accounting I	3	2	3
1814 Case Studies Industrial Sales	4	1	4
1823 Business Law I	3	0	3
	19	5	20
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1011 Business Communications	3	0	3
2912 Principles of Accounting II	3	2	3
1824 Business Law II	3	0	3
1842 Advertising and Display	3	2	4
1820 Sales Management	4	0	4
1804 Risk and Insurance	3	0	3
	19	4	20
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			108

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Secretarial Technologies

The Secretarial Technologies offer up-to-date programs for professional development in secretarial science. CTC's curricula are designed to accommodate each student's needs. For those students with no previous training, beginning Century 21 shorthand classes and beginning typing classes are offered. For those students with previous training, advanced Gregg shorthand classes and advanced typing classes are offered. (Advanced placement is achieved only through testing.)

Besides providing a modern and thorough technical and professional education, the curricula are also designed to give attention to the liberal aspects of a college education needed by the secretary in the modern business world. This background enables the secretary to take an active part in the mainstream of society.

Secretaries are emerging as important members of the management team. Through the years they have earned recognition, status and prestige. More than ever secretaries must accept the challenge of their changing role and be prepared for the new role as part of the professional management team.

The function of the Secretarial program is to prepare men and women for these responsible secretarial and clerical positions in business as well as those in industry and public service.

Three major areas of secretarial education are offered.

Executive Secretarial — prepares a man or woman for a responsible position as an executive secretary or administrative assistant and requires a thorough background in shorthand. In addition, this program offers a study of modern business practices and office procedures.

General Secretarial — is designed for the man or woman who desires training to qualify for any of a broad range of office positions requiring a variety of technical skills. In this program a student can learn office skills, a knowledge of accounting and other fundamental office techniques as well as develop skill in the area of machine transcription.

Legal Secretarial — prepares a man or woman to be a legal secretary thoroughly familiar with judicial procedures and legal terminology in working with a wide variety of legal documents including briefs, petitions, subpeonas, wills, contracts and deeds.

Secretarial Technology Executive Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1120 Introduction to Business Mathematics	4	0	4
2925 Business Principles	3	0	3
3001 Typewriting I	2	3	3
3011 Shorthand I - Century 21 OR	4	1	4
3010 Shorthand I - Gregg	4	1	4
3021 Office Procedures	3	0	3
	19	4	20
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1009 Business English	3	0	3
1121 Business Mathematics	4	0	4
3002 Typewriting II	2	3	3
3012 Shorthand II - Century 21 OR	4	1	4
3020 Shorthand II - Gregg	4	1	4
2926 Principles of Management	3	0	3
3032 Records Management	3	0	3
	19	4	20
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1002 Communication Skills II	3	0	3
1521 Introduction to Sociology	3	0	3
1823 Business Law I	3	0	3
3003 Typewriting III	2	3	3
3013 Shorthand III - Gregg & C21	4	1	4
3022 Office Machines	2	3	3
	17	7	19
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1011 Business Communications	3	0	3
1021 Human Relations	3	0	3
2911 Principles of Accounting I	3	2	3
3014 Transcription I - Gregg & C21	2	8	4
3024 Secretarial Procedures	3	0	3
	14	10	16
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1020 Effective Speaking	3	0	3
1512 Microeconomics	3	0	3
1799 Survey of Data Processing	4	1	4
2912 Principles of Accounting II	3	2	3
3015 Transcription II - Gregg & C21	2	8	4
	15	11	17
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			105

*A competency-based math test will be administered to all entering Business Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Secretarial Technology General Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1120 Introduction to Business Mathematics	4	0	4
1799 Survey of Data Processing OR	4	1	4
**---- Technical Elective			
2925 Business Principles	3	0	3
3001 Typewriting I	2	3	3
3021 Office Procedures	3	0	3
	19	4	20
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1009 Business English	3	0	3
1121 Business Mathematics	4	0	4
2926 Principles of Management	3	0	3
3002 Typewriting II	2	3	3
3032 Records Management	3	0	3
	15	3	16
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1002 Communication Skills II	3	0	3
1521 Introduction to Sociology	3	0	3
1823 Business Law I	3	0	3
2905 Money & Banking	3	0	3
3003 Typewriting III	2	3	3
3027 Office Practicum	2	3	3
3022 Office Machines	2	3	3
	18	9	21
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1011 Business Communications	3	0	3
1021 Human Relations	3	0	3
1832 Personnel Management	3	0	3
2909 Office Accounting I	2	3	3
3004 Typewriting IV	2	3	3
3024 Secretarial Procedures	3	0	3
	16	6	18
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1020 Effective Speaking	3	0	3
1512 Microeconomics	3	0	3
2904 Office Management	3	0	3
2910 Office Accounting II	2	3	3
3028 Secretarial Practicum OR	3	7	5
1712 Data Entry Systems	2	3	3
	14/13	10/6	17/15
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			105/103

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**1804, 1811, 1836, 2911

Secretarial Technology Legal Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1120 Introduction to Business Mathematics	4	0	4
2925 Business Principles	3	0	3
3001 Typewriting I	2	3	3
3011 Shorthand I - Century 21 OR	4	1	4
3010 Shorthand I - Gregg	4	1	4
3021 Office Procedures	3	0	3
	19	4	20
■ First Co-op Term			
9201 Cooperative Employment	3	40	2
■ Second School Term (January & April)			
1009 Business English	3	0	3
1121 Business Mathematics	4	0	4
3002 Typewriting II	2	3	3
3012 Shorthand II - Century 21 OR	4	1	4
3020 Shorthand II - Gregg	4	1	4
1512 Microeconomics	3	0	3
3032 Records Management	3	0	3
	19	4	20
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
1002 Communication Skills II	3	0	3
1521 Introduction to Sociology	3	0	3
1823 Business Law I	3	0	3
3003 Typewriting III	2	3	3
3013 Shorthand III - Gregg & C21	4	1	4
3022 Office Machines	2	3	3
	17	7	19
■ Third Co-op Term			
9203 Cooperative Employment	4	40	3
■ Fourth School Term (November & January)			
1824 Business Law II	3	0	3
3025 Legal Secretarial Procedures I	2	3	3
2911 Principles of Accounting I	3	2	3
1021 Human Relations	3	0	3
3016 Legal Terms & Transcription I - Gregg & C21	2	8	4
1011 Business Communications	3	0	3
	16	13	19
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
3045 Legal Research Projects I	2	8	4
1799 Survey of Data Processing	4	1	4
2912 Principles of Accounting II	3	2	3
1020 Effective Speaking	3	0	3
3017 Legal Terms & Transcription II - Gregg & C21	2	8	4
	14	19	18
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			109

*A competency-based math test will be administered to all entering Business Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Engineering Technologies Division

The Engineering Technologies Division offers programs in many engineering technology disciplines to help meet the need for competent technicians which is required by today's highly technological society. All programs are either two-year associate degree programs or one-year certificate programs.

The curriculum followed in each program provides the specialized technical instruction in the student's major area of concentration and the basic theory and skills in physics and mathematics. In addition, the student takes a variety of courses in communication skills, the humanities and social sciences. These courses enable the student to express ideas in speech and writing, and to better understand himself or herself, others and society.

As available, related co-op work experience plays an important part in the student's technical education. Co-op work experience is such an important part of CTC's philosophy of technical education that it is integrated into each associate degree granting program. The co-op credit hours identified in each curriculum are required for the associate degree. Students wishing not to co-op must make up the co-op credits with approved academic credits. *Students with valid work experience prior to acceptance into an engineering technology program can receive up to 13 advance standing co-op credits. However, students must apply for advance standing co-op credit during the first term in which they matriculate.*

Upon successful completion of the two-year program the student is awarded an associate degree in applied science.

In order to insure a high degree of success in the technology selected, the student must be able to perform at established academic levels in mathematics, communication skills and reading comprehension. To aid in determining these levels it is required that all students planning to enter an engineering technology program, except those with appropriate transfer credits, take the college entrance test.

If the test indicates that a student does not meet certain academic levels, the student may be advised to take appropriate preparatory courses before acceptance is finalized. Students are encouraged to test and finalize the admissions process as soon as possible. If any preparatory courses are needed, students may be able to enroll in them in the summer term, thereby bettering their chances to enter the technology in the September and/or November terms when most of the technologies' coursework begins.

Air Conditioning/Heating Technology

The rapidly increased demand for "environmental control" has generated the industry, Heating/Air Conditioning, with a new array of career opportunities. Manufacturers and dealers need technically trained personnel to research, develop, design, make, sell, install, service and maintain air conditioning and heating installations in residences, offices and plants. In some cases these units merely heat and cool the air; in others they clean and moisture-control it as well. In many instances it is needed to safeguard sophisticated equipment, specialized industrial processes or, indeed, human life itself.

Refrigeration processes and equipment constitute a major related responsibility of this field.

The Heating/Air Conditioning industry has an acute need for trained technicians and affords them exceptional career possibilities.

Air Conditioning/Heating Technology Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trignometry I	4	0	4
7000	Engineering Tech Orientation	1	0	1
7008	Basic Engineering Drawing	2	4	3
7510	Elements of Refrigeration	4	2	5
7701	Electrical Fundamentals I	3	2	3
		17	8	19
■ First Co-op Term				
9401	Cooperative Employment	1	40	2
■ Second School Term (January & April)				
1002	Communication Skills II	3	0	3
1192	Algebra & Trigonometry II	4	0	4
2291	Physics I - Kinematics & Dynamics	3	2	3
7016	Engineering Graphics (Sheet Metal Layout)	2	2	3
7520	Elements of Heating	3	2	3
7702	Electrical Fundamentals II	3	2	3
		18	8	19
■ Second Co-op Term				
9402	Cooperative Employment	1	40	2
■ Third School Term (June & September)				
1179	Technical Statistics	4	0	4
2292	Physics II - Mechanics & Heat	3	2	3
7735	Elements of Power Electronics	3	2	3
7530	Air Conditioning Principles I	3	2	3
7532	Sheet Metal Installation Techniques	2	2	3
1021	Human Relations	3	0	3
		18	8	19
■ Third Co-op Term				
9403	Cooperative Employment	1	40	3
■ Fourth School Term (November & January)				
1020	Effective Speaking	3	0	3
2293	Physics III - Electromagnetic Wave	3	2	3
7531	Air Conditioning Applications	3	2	3
7540	Air Conditioning Principles II	4	2	4
7541	Air Conditioning Design I	4	2	4
		17	8	17
■ Fourth Co-op Term				
9404	Cooperative Employment	1	40	3
■ Fifth School Term (April & June)				
1010	Technical Writing	3	0	3
1513	Macroeconomics	3	0	3
15--	Non-tech Elective	3	0	3
7550	Air Conditioning Principles III	3	2	3
7551	Air Conditioning Design II	3	4	4
7552	Air Conditioning Controls	3	2	3
		18	8	19
■ Fifth Co-op Term				
9405	Cooperative Employment	1	40	3
				106

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Technical Electives
7745 Digital Power Electronics
7040 Industrial Supervision & Management
7135 Industrial Fluid Power Systems
7757 Electrical Maintenance

Aviation Technology

The Aviation program is designed to prepare aircraft and powerplant mechanics for employment in commercial, corporate or general aviation.

The curriculum includes the theoretical and practical training designed to equip the student with the competence required to work effectively with all of these systems.

The student gains experience in working with a variety of types of aircraft and engines. The program includes eight academic terms and two co-op terms. The first five academic terms concentrate on general and airframe and the last three terms on powerplant.

Co-op positions normally are in general aviation. Graduates may be employed by fixed base operators, corporate plane operations or commercial airlines.

Aviation Technology Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First School Term (September)				
1001	Communication Skills I	3	0	3
*1171	Technical Mathematics I	4	0	4
8100	Aircraft Orientation	3	2	3
7704	Basic Industrial Electricity	3	2	3
8102	Machine and Hand Tools	1	4	3
8103	Basic Aerodynamics & FAA Regulations	3	2	3
		17	10	19
■ Second School Term (November)				
1172	Technical Mathematics II	4	0	4
2291	Physics I - Kinematics/Dynamics	3	2	3
8120	Airframe Structures	5	5	5
8140	Aircraft Electrical Systems	5	5	5
		17	12	17
■ Third School Term (January)				
1192	Algebra & Trigonometry II	4	0	4
7009	Engineering Graphics (Aviation)	1	4	2
2292	Physics II - Mechanics & Heat	3	2	3
8101	Welding Processes	1	4	2
8110	Fuels and Fuel Systems	1	4	2
8131	Aircraft Structures (Metal)	3	7	4
		13	21	17
■ Fourth School Term (April)				
1002	Communication Skills II	3	0	3
2293	Physics III - Electromagnetic Wave	3	2	3
8121	Airframe Hydraulic & Pneumatic Sys.	1	4	2
8122	Materials and Processes	2	3	3
8151	Airframe Assembly & Rigging	3	7	5
8142	Flight Line Maintenance I	1	4	2
		13	20	18
■ Fifth School Term (June)				
1021	Human Relations	3	0	3
8150	Aircraft Electrical Generating Sys.	3	2	3
8130	Aircraft Sys., Hyd. & Pneu. Land. Gear	3	7	5
8141	Aircraft Instr., Comm. & Nav. & Util. Sys.	5	5	5
8152	Flight Line Maintenance II	2	3	3
		16	17	19
■ Sixth School Term (September)				
1513	Macroeconomics	3	0	3
15--	Non-tech Elective	3	0	3
8160	Powerplant Theory, Reciprocating	5	5	5
8161	Powerplant Lubrication	3	2	3
8162	Propellers	3	2	3
		17	9	17

■ Seventh School Term (November & January)			
1020 Effective Speaking	3	0	3
8170 Powerplant Theory, Turbine	5	5	5
8171 Fuel Metering Systems	3	2	3
8172 Ignition Systems	5	5	5
	16	12	16
■ Seventh Co-op Term			
9401 Cooperative Employment	1	40	2
■ Eighth School Term (April & June)			
1010 Technical Writing	3	0	3
8180 Turbine Powerplant Sys. & Components	6	4	6
8181 Powerplant Carburetor Fuel Sys.	6	4	6
**8182 Airframe & Powerplant Comprehensive	3	2	3
	18	10	18
■ Eighth Co-op Term			
9402 Cooperative Employment	1	40	2
			145

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**This course is not required for degree purposes but is highly recommended.

Aviation Maintenance Certificate Programs

Included in the Aviation Maintenance degree program are two certificate programs (Air Agency certificate No. 105-5). At the successful completion of either or both of the airframe and/or powerplant requirements, Cincinnati Technical College issues a certificate which, upon presentation to a FAA designated examiner, allows students to take the FAA written test leading to licensing.

Airframe Certificate Curriculum

	Hours Per Week Class	Lab	Credit Hours
11-- Math	4	0	4
8100 Aircraft Orientation	3	2	3
8102 Machine & Hand Tools	1	4	3
8103 Basic Aerodynamics & FAA Regulations	3	2	3
2291 Physics I - Kinematics & Dynamics	3	2	3
2292 Physics II - Mechanics & Heat	3	2	3
2293 Physics III - Electromagnetic Waves	3	2	3
8120 Airframe Structures	5	5	5
8140 Aircraft Electrical Systems	5	5	5
7009 Engineering Graphics (Aviation)	1	4	2
8101 Welding Processes	1	4	2
8110 Aircraft Fuels & Fuel Systems	1	4	2
8131 Airframe Structures, Sheet Metal	3	7	4
8121 Airframe Hydraulic & Pneumatic Systems	1	4	2
8122 Materials & Processes	2	3	3
8151 Airframe Assembly & Rigging	3	7	5
8142 Fightline Maintenance I	1	4	2
8150 Aircraft Electrical Generating Systems	3	2	3
8130 Airframe Systems, Hydraulic & Pneumatic Landing Gears	3	7	5
8141 Aircraft Instrument, Communications & Navigation & Utility Systems	5	5	5
	54	75	67

Powerplant Certificate Curriculum

	Hours Per Week Class	Lab	Credit Hours
11-- Math	4	0	4
1001 Communications Skills I	3	0	3
8100 Aircraft Orientation	3	2	3
8103 Basic Aerodynamics & FAA Regulations	3	2	3
2291 Physics I - Kinematics & Dynamics	3	2	3
2292 Physics II - Mechanics & Heat	3	2	3
2293 Physics III - Electromagnetic Waves	3	2	3
7009 Engineering Graphics (Aviation)	1	4	2
8122 Materials & Processes	2	3	3
8142 Flightline Maintenance I	1	4	2
8152 Flightline Maintenance II	2	3	3
8160 Powerplant Theory, Reciprocating	5	5	5
8161 Powerplant Lubrication	3	2	3
8162 Propellers	3	2	3
8170 Powerplant Theory, Turbine	5	5	5
8171 Fuel Metering Systems	3	2	3
8172 Ignition Systems	5	5	5
8180 Turbine Powerplant Systems Components	6	4	6
8181 Powerplant Carburetor Fuel Systems	6	4	6
	64	53	68

Biomedical Engineering Technology

The Biomedical Engineering Technology is a relatively new field created by the interaction of physicians, scientists and engineers. Together they have developed complex electronic apparatus now used to diagnose, prevent and treat disease. Various types of medical equipment have become almost indispensible tools of the modern physician and hospital.

Someone with a knowledge of why and how this equipment works must be available to keep it running safely and effectively. That person is a Biomedical Engineering Technician (BMET). In various sections of the country, the person may be referred to as a clinical technician, a medical instrument technician or some similar title. The technician's basic function, however, remains the same.

The BMET is employed by both hospitals and equipment manufacturers.

Biomedical Engineering Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1191 Algebra & Trigonometry I	4	0	4
7030 Computer Programming (Basic)	2	2	3
4005 Chemistry for Health Technology	3	2	4
7000 Engineering Tech Orientation	1	0	1
7710 D.C. Circuits Analysis	6	3	5
	19	7	20
■ First Co-op Term			
9401 Cooperative Employment	1	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2291 Physics I - Kinematics & Dynamics	3	2	3
4011 General Anatomy	2	3	3
7720 A.C. Circuits Analysis	6	3	5
	18	8	18
■ Second Co-op Term			
9402 Cooperative Employment	1	40	2
■ Third School Term (June & September)			
1193 Functions & Introduction to Calculus	4	0	4
2293 Physics III - Electromagnetic Wave	3	2	3
4012 Human Physiology I	3	2	4
7730 Electronics I	6	3	5
7731 Digital Systems I	3	3	4
	19	10	20
■ Third Co-op Term			
9403 Cooperative Employment	1	40	3
■ Fourth School Term (November & January)			
1020 Effective Speaking	3	0	3

1021	Human Relations	3	0	3
15--	Non-tech Elective	3	0	3
7741	Digital Systems II	3	3	4
7740	Electronics II	4	2	4
+7749	Biomedical Instrumentation I	3	2	3
		19	7	20
■ **Fourth Co-op Term**				
9404	Cooperative Employment	1	40	3
■ **Fifth School Term (April & June)**				
1010	Technical Writing	3	0	3
1513	Macroeconomics	3	0	3
7750	Electronics III	4	2	4
7751	Digital Systems III	3	3	4
+7759	Biomedical Instrumentation II	4	2	4
		17	7	18
■ **Fifth Co-op Term**				
9405	Cooperative Employment	1	40	3
				109

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level or experience and aptitude.

+Offered in late afternoon or evening.

Recommended Technical Electives
7031 Computer Programming (Fortran)
7132 Hydraulics & Pneumatics I
7753 Communication Systems II
7799 Special Problems Seminar - Electrical
7743 Communication Systems I

Civil Engineering Technology (An ABET accredited program)

Civil Engineering Technology is a single program from which a student may elect one of two majors.

Surveying Major

The continuous increase in the value of land is resulting in a need for trained land managers. A vital member of the management team is the Land Surveyor.

Land Surveyors provide a variety of services including topographic mapping, field layout of construction projects, design and layout of urban subdivisions, establishment of property boundaries and preparation of legal descriptions. Surveyors also work in specialized areas such as hydrographic mapping, aerial photogrammetry, geodetic control and mining surveys. In few other occupations is an individual given the opportunity to combine both outside field work with office work, and the flexibility of establishing a private practice or working for a larger firm.

The Surveying Major is designed to help prepare the student for possible registration as a professional surveyor.

Students are exposed quickly to surveying terminology and equipment so that they can offer their co-op employer immediate service. CTC is equipped with conventional survey equipment: transits, tapes, builder's levels, etc., and with modern theodolites, electronic distance measuring equipment and automatic levels.

In a similar manner drafting is covered early with emphasis on surveying related drawings: plats, contour maps, cross sections, profiles, etc.

Once the equipment and drafting familiarization is complete the student progresses into calculation related areas: traverses, coordinate geometry, area determination, etc. At this stage the student becomes quite familiar with handheld calculators, and is exposed to programmable calculators and larger computer systems. This completes preparation in the "basic skills."

Many areas of surveying follow. They include design and layout of horizontal, vertical and spiral transition curves, state plane coordinate calculations, document research, land survey systems, deed writing, evaluation of evidence and astronomic observations. In the fifth term students complete an actual field project from preliminary research to final resolution and platting.

Aside from the surveying courses students also take courses in related areas such as real estate, site development and drainage control.

Construction Major

The Construction graduate will become a vital link between tradesman and engineer. The building construction team creates the structures of civilization: houses, roads, factories, skyscrapers and the hundred other shelters that make life worthwhile. It is challenging work! Success falls to those trained in how to plan, schedule, build and manage the construction project. A basic understanding of engineering principles, including knowledge of new techniques ahead of the state-of-the-art, identifies a valued employee. Graduates work as field supervisors for builders, as draftsmen and office engineers for consulting firms, as laboratory technicians for testing companies. Job openings are as varied as the civil engineering profession. The rewards of the CTC program are great! The short two-year investment in time and study pays off as the quickest way to enter the construction field in positions of responsibility.

Civil Engineering Technology Curriculum Surveying Major

		Hours Per Week Class	Lab	Credit Hours
■ **First School Term (September & November)**				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trigonometry I	4	0	4
2291	Physics I - Kinematics & Dynamics	3	2	3
2951	Real Estate Principles & Practices	3	0	3
7910	Surveying Measurements	2	4	3
7911	Construction Methods	3	1	3
7000	Engineering Tech Orientation	1	0	1
		19	7	20
■ **First Co-op Term**				
9401	Cooperative Employment	1	40	2
■ **Second School Term (January & April)**				
1002	Communication Skills II	3	0	3
1192	Algebra & Trigonometry II	4	0	4
2292	Physics II - Mechanics & Heat	3	2	3
7032	Introduction to Computer Programming (Civil)	3	2	3
7024	Civil Engineering Grpahics I	2	4	3
7920	Surveying Calculations	4	2	3
		19	10	19
■ **Second Co-op Term**				
9402	Cooperative Employment	1	40	2
■ **Third School Term (June & September)**				
1193	Functions & Introduction to Calculus OR	4	0	4
1179	Technical Statistics	4	0	4
7111	Engineering Materials	3	2	3
1021	Human Relations	3	0	3
7025	Civil Engineering Graphics II	1	4	2
7930	Route Surveying	3	3	3
7934	Statics	3	2	3
		17	11	18
■ **Third Co-op Term**				
9403	Cooperative Employment	1	40	3

■ Fourth School Term (November & January)				
2293	Physics III - Electromagnetic Waves	3	2	3
15--	Non-tech Elective (Rec at Night)	3	0	3
1020	Effective Speaking	3	0	3
7947	Drainage Control Systems	3	2	3
7940	Elements of Land Surveying	3	2	3
7948	Site Development	3	2	3
7943	Estimation & Inspection	3	2	3
		21	10	21
■ Fourth Co-op Term				
9404	Cooperative Employment	1	40	3
■ Fifth School Term (April & June)				
1010	Technical Writing	3	0	3
1513	Macroeconomics	3	0	3
7950	Surveying Field Project	1	6	3
7952	Contracts & Specifications	3	0	3
7957	Potable & Wastewater Treatment	3	1	3
7955	Soils Engineering	2	3	3
		15	10	18
■ Fifth Co-op Term				
9405	Cooperative Employment	1	40	3
				109

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Civil Engineering Technology Curriculum
Construction Major

		Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trigonometry I	4	0	4
2291	Physics I - Kinematics & Dynamics	3	2	3
2951	Real Estate Principles & Practices	3	0	3
7910	Surveying Measurements	2	4	3
7911	Construction Methods	3	1	3
7000	Engineering Tech Orientation	1	0	1
		19	7	20
■ First Co-op Term				
9401	Cooperative Employment	1	40	2
■ Second School Term (January & April)				
1002	Communication Skills II	3	0	3
1192	Algebra & Trigonometry II	4	0	4
2292	Physics II - Mechanics & Heat	3	2	3
7032	Introduction to Computer Programming (Civil)	3	2	3
7920	Surveying Calculations	4	2	3
7024	Civil Engineering Graphics I	2	4	3
		19	10	19
■ Second Co-op Term				
9402	Cooperative Employment	1	40	2
■ Third School Term (June & September)				
1193	Functions & Introduction to Calculus	4	0	4
7111	Engineering Materials	3	2	3
1021	Human Relations	3	0	3
7025	Civil Engineering Graphics II	1	4	2
7931	Light Construction	3	3	3
7934	Statics	3	2	3
		17	11	18
■ Third Co-op Term				
9403	Cooperative Employment	1	40	3
■ Fourth School Term (November & January)				
2293	Physics III - Electromagnetic Wave	3	2	3
15--	Non-tech Elective (recommended at night)	3	0	3
1020	Effective Speaking	3	0	3
7944	Strength of Materials (Civil)	3	2	3
7945	Structural Design I	3	2	3
7943	Estimation & Inspection	3	2	3
7941	Heavy Construction	3	2	3
		21	10	21
■ Fourth Co-op Term				
9404	Cooperative Employment	1	40	3
■ Fifth School Term (April & June)				
1010	Technical Writing	3	0	3
1513	Macroeconomics	3	0	3
7954	Structural Design II	2	4	3
7952	Contracts & Specifications	3	0	3
7953	Construction Management & Operation	2	3	3
7955	Soils Engineering	2	3	3
		15	10	18
■ Fifth Co-op Term				
9405	Cooperative Employment	1	40	3
				109

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Electronics Engineering Technology

Since the advent of space technologies the field of Electronics has experienced an astronomical growth in technological advancement and application to our everyday lives. This growth has resulted in a need for knowledgeable technicians to supply services required by industry as electronics is applied to their products.

Although the transmission and reception of electromagnetic radiation for radio, television, telephones and radar is still a large area in electronics, the computer has ushered in a whole new age of digital electronics, where everything from doorbells and calculators to machine tools and rocketships utilize electronic circuitry to process information and make control decisions. The microprocessor is making a large impact in this area for industry because it is a relatively low cost, compact, computer-like device which is capable of performing the specific functions required by industry.

Manufacturers and researchers are therefore looking for persons who have

- Knowledge of the theory of operation of electronic equipment;
- Practical training and "hands-on" experience;
- Ability to apply their knowledge of electronics to the product area of the employer; and
- Willingness to work in a production type of role on the job. A typical job description for the Digital Electronics technician would include
- Repair and/or maintenance of electronically controlled equipment;
- Inspection and final check-out of such equipment before shipment to customer;
- Installation and start-up in the field for the customer;
- Calibration of equipment;
- Operation or operational supervision of electronic equipment; and
- Engineer's assistant in development of new products.

The field of computer electronics is constantly in a state of change and updating, and the need for qualified, knowledgeable technicians is correspondingly on the increase nationwide. Computer aided manufacturing and computer aided drafting are concepts only now being implemented, and the next decade promises to offer an ever-increasing demand for the Electronics Technician.

Telecommunications Electronics — Although no discreet curriculum exists for the Communications Electronics area,

various technical electives specifically applicable to telecommunications are available for interested students. Please consult with the program coordinator/advisor relative to this matter. As per divisional policy, the degree awarded will be in the discipline of Electronics Engineering Technology with the transcript reflecting the concentration of Telecommunications courses as per the student's interest.

Electronics Engineering Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
First School Term (September & November)			
1001 Communication Skills I	3	0	3
7000 Engineering Tech Orientation	1	0	1
1191 Algebra & Trigonometry I	4	0	4
2291 Physics I - Kinematics & Dynamics	3	2	3
7030 Computer Programming (Basic)	2	2	3
7710 D.C. Circuits Analysis	6	3	5
	19	7	19
First Co-op Term			
9401 Cooperative Employment	1	40	2
Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2292 Physics II - Mechanics & Heat	3	2	3
7008 Basic Engineering Drawing	2	4	3
7720 A.C. Circuits Analysis	6	3	5
	18	9	18
Second Co-op Term			
9402 Cooperative Employment	1	40	2
Third School Term (June & September)			
1021 Human Relations	3	0	3
1193 Functions & Introduction to Calculus	4	0	4
2293 Physics III - Electromagnetic Waves	3	2	3
7730 Electronics I	6	32	5
7731 Digital Systems I	3	3	4
	19	8	19
Third Co-op Term			
9403 Cooperative Employment	1	40	3
Fourth School Term (November & January)			
7--- Technical Elective			3
7740 Electronics II	4	2	4
7743 Communications Systems I	4	2	4
7741 Digital Systems II	3	3	4
1020 Effective Speaking	3	0	3
			18
Fourth Co-op Term			
9404 Cooperative Employment	3	40	3
Fifth School Term (April & June)			
1010 Technical Writing	3	0	3
1513 Macroeconomics	3	0	3
15--- Non-tech Elective	3	0	3
7750 Electronics III	4	2	4
7751 Digital Systems III	3	3	4
7--- Technical Elective			3
			20
Fifth Co-op Term			
9405 Cooperative Employment	1	40	3
			107

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Recommended Technical Electives
7031 Computer Programming (Fortran)
7040 Industrial Supervision & Management
7132 Hydraulics & Pneumatics I
7752 Electronics Project
7753 Communication Systems II
7758 Industrial Motors & Controls
7799 Special Problems Seminar - Electrical

Electrical Power Engineering Technology

Electrical Power Technology has made enormous progress in recent years. Improvements in insulating materials, transmission methods and rotating machinery have been so great that electricity continues to be an all-pervasive source of energy. This rapid progress has left a technological gap between the electrical engineer and the vocational employee. Electrical Power Technicians are trained to fill the gap created by the application of electronics, energy conservation and personnel safety techniques to traditional electrical power systems.

Graduates find employment as Electrical Design Drafters and Preventive Maintenance Technicians.

Designers work with professional electrical engineers laying out motor control and energy management circuits and power systems for motors, electric heating, lighting and high voltage equipment. They may also find employment with contractors performing shop drawings and estimates of job costs.

Preventive maintenance technicians work for power companies, industrial plants and high voltage service firms. They are trained in the operation of sophisticated electrical testing devices that can ascertain the reliability of electrical power systems.

Electrical Power Engineering Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1191 Algebra & Trigonometry I	4	0	4
2291 Physics I - Kinematics & Dynamics	3	2	3
7000 Engineering Tech Orientation	1	0	1
7008 Basic Engineering Drawing	2	4	3
7710 D.C. Circuits Analysis	6	3	5
	19	9	19
First Co-op Term			
9401 Cooperative Employment	1	40	2
Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2292 Physics II - Mechanics & Heat	3	2	3
7018 Electrical Drafting & Design	1	3	2
7720 A.C. Circuits Analysis	6	3	5
7725 Electrical Lighting Design	3	0	3
	20	8	20
Second Co-op Term			
9402 Cooperative Employment	1	40	2
Third School Term (June & September)			
1193 Functions & Introduction to Calculus	4	0	4
1513 Macroeconomics	3	0	3
7030 Computer Programming (Basic)	2	2	3
7734 D.C. Machinery & Controls	3	3	4
7735 Elements of Power Electronics	3	2	3
7736 Wiring Systems	3	2	3
	18	9	20

■ Third Co-op Term			
9403 Cooperative Employment	1	40	3
■ Fourth School Term (November & January)			
1020 Effective Speaking	3	0	3
1021 Human Relations	3	0	3
2293 Physics III - Electromagnetic Wave	3	2	3
7744 A.C. Machinery & Controls	3	3	4
7745 Digital Power Electronics	3	2	3
7746 Industrial Power Distribution	3	1	3
	18	8	19
■ Fourth Co-op Term			
9404 Cooperative Employment	1	40	3
■ Fifth School Term (April & June)			
1010 Technical Writing	3	0	3
15-- Non-tech Elective	3	0	3
7755 Electrical Estimating	2	3	3
7756 Power Generation & Transmission	3	1	3
7757 Electrical Preventive Maintenance	3	2	3
7--- Technical Elective			3
			18
■ Fifth Co-op Term			
9405 Cooperative Employment	1	40	3
			109

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Recommended Technical Electives

2294 Physics IV - Atomic and Nuclear
1194 Differential & Integral Calculus
7501 HVAC Plant Maintenance
7140 Strength of Materials
7135 Industrial Fluid Power Systems

Electro-Mechanical Engineering Technology

The technological impact of automation in American industry, the rapidly expanding uses for electronic computers, and the tremendous increase in Man's technical knowledge have increased the need for a large number of technically trained personnel who understand both the mechanical and electrical phases of automated systems.

In an effort to meet this growing need for the highly trained technician, Cincinnati Technical College, with the assistance of interested professionals from local industry, developed the Electro-Mechanical Technology program. The program provides study and practice in measurement systems, automation and control system, special purpose and electronic devices in production, and fabrication control in manufacturing.

The Electro-Mechanical students enjoy tremendous flexibility in job opportunities available upon graduation because of their well-rounded background in both the electrical and mechanical technologies. Graduates have found positions in field service of industrial equipment, research and development of industrial robots, electronic measurement and testing, equipment design, supervisory and numerous other positions. Some graduates have also furthered their education and have received baccalaureate and masters degrees.

Electro-Mechanical Engineering Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1191 Algebra & Trigonometry I	4	0	4
2291 Physics I - Kinematics & Dynamics	3	2	3
7000 Engineering Tech Orientation	1	0	1
7008 Basic Engineering Drawing	2	4	3
7710 D.C. Circuits Analysis	6	3	5
	19	9	19
■ First Co-op Term			
9401 Cooperative Employment	1	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2292 Physics II - Mechanics & Heat	3	2	3
7030 Computer Programming (Basic)	2	2	3
7720 A.C. Circuits Analysis	6	3	5
	18	7	18
■ Second Co-op Term			
9402 Cooperative Employment	1	40	2
■ Third School Term (June & September)			
1021 Human Relations	3	0	3
1193 Functions & Introduction to Calculus	4	0	4
7135 Fluid Power Systems	4	4	4
7731 Digital Systems I	3	3	4
7732 Industrial Control Electronics	6	3	5
	20	10	20
■ Third Co-op Term			
9403 Cooperative Employment	1	40	3
■ Fourth School Term (November & January)			
1020 Effective Speaking	3	0	3
2293 Physics III - Electromagnetic Waves ...	3	2	3
7104 Machine Tools & Manufacturing Processes	3	3	3
7140 Strength of Materials	4	2	4
7146 Electro-Mechanical Controls I (Servomechanisms)	4	3	4
7--- Technical Elective			3
			20
■ Fourth Co-op Term			
9404 Cooperative Employment	1	40	3
■ Fifth School Term (April & June)			
1010 Technical Writing	3	0	3
1513 Macroeconomics	3	0	3
7--- Technical Elective			3
15-- Non-tech Elective	3	0	3
7157 Electro-Mechanical Controls II (Microprocessors)	3	3	4
7758 Industrial Motors & Controls	3	2	3
			19
■ Fifth Co-op Term			
9405 Cooperative Employment	1	40	3
			109

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Recommended Technical Electives

7031 Computer Programming (Fortran)
7142 Mechanisms Analysis
7150 Machine Design
7010 Engineering Drawing
7149 Computer Applications (CNC-NC)

Industrial Engineering Technology

A new plant is to be built. It will receive raw material for processing, fabricating, assembling and out-put finished products.

A lot of questions need to be answered. What's the best layout for the plant? How can the materials be processed most

efficiently? What machines should be used? How should they be spaced? How can the employees be motivated to do high quality work? How can costs be lowered to meet those of efficient competitors?

The Industrial Engineering technician is one of the members of the productivity team interested in finding the solutions to these problems. This type of technician is used by industry in both new and long established plants to measure and analyze production data and devise means of improving the methods of production. These same problems need to be resolved in hospitals, transportation, warehousing, major department store chains and government agencies.

Graduates of this program may begin full-time work as technicians in these areas: methods, time-analysis, work measurement, production control, quality control, wage and job evaluation, material handling, plant layout. Able graduates can advance to more responsible positions with additional training and experience. The computer terminal is a normal classroom tool for use by Cincinnati Technical College students.

Cooperative training positions are in large and small industrial plants, hospitals and other areas mentioned above.

Industrial Engineering Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (November)			
1001 Communication Skills I	3	0	3
*1191 Algebra & Trigonometry I	4	0	4
7000 Engineering Tech Orientation	1	0	1
7008 Basic Engineering Drawing	2	4	3
• 7111 Engineering Materials	3	2	3
7104 Machine Tool & Manufacturing Processes	3	3	3
– 7410 Materials Handling	3	2	3
	19	11	19
■ First Co-op Term			
9401 Cooperative Employment	1	40	2
■ Second School Term (April)			
1002 Communication Skills II	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2291 Physics I - Kinematics & Dynamics	3	2	3
7030 Computer Programming (Basic)	2	2	3
– 7430 Time & Motion Study	3	2	3
7811 Welding Processes & Techniques	3	3	3
	18	9	19
■ Second Co-op Term			
9402 Cooperative Employment	1	40	2
■ Third School Term (September)			
1193 Functions & Introduction to Calculus	4	0	4
2292 Physics II - Mechanics & Heat	3	2	3
– 7409 Industrial Safety & OSHA	3	2	3
7040 Industrial Supervision & Management	3	0	3
7010 Engineering Drawing	2	4	3
7132 Hydraulics & Pneumatics I	3	2	3
	18	10	19
■ Third Co-op Term			
9403 Cooperative Employment	1	40	3
■ Fourth School Term (January)			
1021 Human Relations	3	0	3
2293 Physics III - Electromagnetic Waves	3	2	3
1020 Effective Speaking	3	0	3
7113 Materials Processes & Fabrication	4	2	4
• 7452 Industrial Hygiene Measurements	3	2	3
7708 Electrical Fundamentals & Controls	4	2	4
	20	8	20
■ Fourth Co-op Term			
9404 Cooperative Employment	1	40	3
■ Fifth School Term (June)			
1010 Technical Writing	3	0	3
1513 Macroeconomics	3	0	3
15-- Non-tech Elective	3	0	3
7159 Manufacturing Methods, & Cost Control	3	2	3
• 7440 Industrial Processes & Plant Layout	3	4	4
7--- Technical Elective			3
			19
■ Fifth Co-op Term			
9405 Cooperative Employment	1	40	3
			109

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Recommended Technical Electives

7031 Computer Programming (Fortran)
7121 Metallurgy of Materials
7140 Strength of Materials
7147 Tool, Jig and Fixture Design
7152 Hydraulics & Pneumatics II
7451 Industrial Engineering Project
7301 Introduction to Plastic Processes
7160 Microprocessor Interfacing

Manufacturing Engineering Technology

Of the many engineering disciplines, Manufacturing Engineering Technolgoy is the newest and most vital in solving the world's productivity problem. Today as never before industry depends on this specialist to start the wheels of production turning. The manufacturing process begins with a concept, usually a mental picture of a needed product. The process ends with parts flowing off a production line. In between lies the industrial function necessary to develop the production process whereby the designer's concept is translated into manufactured goods at the lowest possible cost. Positions open to a Manufacturing Engineering Technician are process engineering technician, tool engineering technician, standards, plant engineering technician, administration and control, and research.

CTC's Manufacturing Engineering Technology program has three options: Machining, Fabrication, and Plastics.

The Machining option concentrates on the operation of all machines in manufacturing with emphasis on drilling, lathes, grinding and numerical control. Routing techniques with respect to tooling, fixtures, machine utilization and sequence of operations are thoroughly covered with emphasis on design for cost and east of operations.

The Fabrication option concentrates on the different techniques of modern welding and includes a strong background in materials. Emphasis is placed on developing a working knowledge of basic welding design such as types of welds required for specific load and material applications. Materials are covered as to their applications in strength, weldability, and ease of operation, as well as cost factors involved in the final design.

The curriculum in Plastics option, as offered by CTC, is designed to provide the student with the necessary technical background in plastics materials, testing, and fabrication by means of various manufacturing processes. Regular classroom instruction is supplemented by laboratory experiments and site training. Plastics technicians trained in this curriculum will have an excellent background suitable for positions in the materials, equipment and fabrication areas of industries concerned with plastics.

Manufacturing Engineering Technology
Machining Option Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trigonometry I	4	0	4
7000	Engineering Tech Orientation	1	0	1
7008	Basic Engineering Drawing	2	4	3
7104	Machine Tools & Manufacturing Processes	3	3	3
7111	Engineering Materials	3	2	3
7301	Introduction to Plastic Processes	3	2	3
		19	11	20
■ First Co-op Term				
9401	Cooperative Employment	1	40	2
■ Second School Term (January & April)				
1002	Communication Skills II	3	0	3
1192	Algebra & Trigonometry II	4	0	4
2291	Physics I - Kinematics & Dynamics	3	2	3
7010	Engineering Drawing	2	4	3
7030	Computer Programming (Basic)	2	2	3
7811	Welding Processes & Techniques	3	3	3
		17	11	19
■ Second Co-op Term				
9402	Cooperative Employment	1	40	2
■ Third School Term (June & September)				
1513	Macroeconomics	3	0	3
1193	Functions & Introduction to Calculus	4	0	4
2292	Physics II - Mechanics & Heat	3	2	3
7132	Hydraulics & Pneumatics I	3	2	3
7441	Quality Control	3	2	3
7---	Technical Elective			3
				19
■ Third Co-op Term				
9403	Cooperative Employment	1	40	3
■ Fourth School Term (November & January)				
1020	Effective Speaking	3	0	3
2293	Physics III - Electromagnetic Waves	3	2	3
7113	Materials Processes & Fabrication	4	2	4
7140	Strength of Materials	4	2	4
7708	Electrical Fundamentals & Controls	4	2	4
		18	8	18
■ Fourth Co-op Term				
9404	Cooperative Employment	1	40	3
■ Fifth School Term (April & June)				
1010	Technical Writing	3	0	3
1021	Human Relations	3	0	3
15--	Non-tech Elective	3	0	3
7147	Tool, Jig & Fixture Design	3	2	3
7149	Computer Applications (CNC-NC)	2	2	3
7159	Manufacturing Methods & Cost Control	3	2	3
7141	Design Economics	2	2	3
		19	8	21
■ Fifth Co-op Term				
9405	Cooperative Employment	1	40	3
				110

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Recommended Technical Electives

7031 Computer Programming (Fortran)
7121 Metallurgy of Materials
7040 Industrial Supervision & Management
7150 Machine Design
7152 Hydraulics & Pneumatics II
7151 Tool Engineering Design
7160 Microprocessor Interfacing

Manufacturing Engineering Technology
Fabrication Option Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First School Term (November)				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trigonometry I	4	0	4
7000	Engineering Tech Orientation	1	0	1
7008	Basic Engineering Drawing	2	4	3
7111	Engineering Materials	3	2	3
7301	Introduction to Plastic Processes	3	2	3
7811	Welding Processes & Techniques	3	3	3
		19	11	20
■ First Co-op Term				
9401	Cooperative Employment	1	40	2
■ Second School Term (April)				
1002	Communication Skills II	3	0	3
1192	Algebra & Trigonometry II	4	0	4
2291	Physics I - Kinematics & Dynamics	3	2	3
7030	Computer Programming (Basic)	2	2	3
7017	Steel Fabrication Layout	2	4	3
7821	Fabrication Processes & Techniques I	3	3	3
		17	11	19
■ Second Co-op Term				
9402	Cooperative Employment	1	40	2
■ Third School Term (September)				
1513	Macroeconomics	3	0	3
1193	Functions & Introduction to Calculus	4	0	4
2292	Physics II - Mechanics & Heat	3	2	3
7441	Quality Control	3	2	3
7831	Fabrication Processes & Techniques II	3	3	3
7121	Metallurgy of Materials	3	2	3
		19	9	19
■ Third Co-op Term				
9403	Cooperative Employment	1	40	3
■ Fourth School Term (January)				
1020	Effective Speaking	3	0	3
2293	Physics III - Electromagnetic Waves	3	2	3
7140	Strength of Materials	4	2	4
7708	Electrical Fundamentals & Controls	4	2	4
7---	Technical Elective			3
				17
■ Fourth Co-op Term				
9404	Cooperative Employment	1	40	3
■ Fifth School Term (June)				
1010	Technical Writing	3	0	3
1021	Human Relations	3	0	3
15--	Non-tech Elective	3	0	3
7040	Industrial Management & Supervision	3	0	3
7---	Technical Elective			3
7159	Manufacturing Methods & Cost Controls	3	2	3
				18
■ Fifth Co-op Term				
9405	Cooperative Employment	1	40	3
				106

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Technical Electives
7031 Computer Programming (Fortran)
7132 Hydraulics & Pneumatics I
7152 Hydraulics & Pneumatics II
7147 Tool, Jig & Fixture Design
7150 Machine Design
7013 Descriptive Geometry
7160 Microprocessor Interfacing

Manufacturing Engineering Technology Plastics Option Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September)			
7000 Engineering Tech Orientation	1	0	1
1001 Communication Skills I	3	0	3
*1191 Algebra & Trigonometry I	4	0	4
7301 Introduction to Plastics Processes	3	2	3
7008 Basic Engineering Drawing	2	4	3
7104 Machine Tools & Manufacturing Processes	3	3	3
7111 Engineering Materials	3	2	3
	19	11	20
■ First Co-op Term			
9401 Cooperative Employment	1	40	2
■ Second School Term (January)			
1002 Communication Skills II	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2291 Physics I - Kinematics & Dynamics	3	2	3
7315 Fiber Reinforced Plastics, Laminates & Castings	3	3	3
7030 Computer Programming (Basic)	2	2	3
7010 Engineering Drawing	2	4	3
	17	11	19
■ Second Co-op Term			
9402 Cooperative Employment	1	40	2
■ Third School Term (June)			
1193 Functions & Introduction to Calculus	4	0	4
1021 Human Relations	3	0	3
2292 Physics II - Mechanics & Heat	3	2	3
7311 Plastics Processes - Thermoforming Methods	3	2	3
7441 Quality Control	3	2	3
7132 Hydraulics & Pneumatics I	3	2	3
	19	8	19
■ Third Co-op Term			
9403 Cooperative Employment	1	40	3
■ Fourth School Term (November)			
1020 Effective Speaking	3	0	3
2293 Physics III - Electromagnetic Waves	3	2	3
7310 Plastics Processes - Compression & Transfer	4	2	4
7140 Strength of Materials	4	2	4
7708 Electrical Fundamentals & Controls	4	2	4
	18	8	18
■ Fourth Co-op Term			
9404 Cooperative Employment	1	40	3
■ Fifth School Term (April)			
1010 Technical Writing	3	0	3
1513 Macroeconomics	3	0	3
15-- Non-tech Elective	3	0	3
7342 Product, Mold & Tool Design	3	3	3
7320 Plastics Processes - Injection/Extrusion	3	3	4
7--- Technical Elective			3
			19
■ Fifth Co-op Term			
9405 Cooperative Employment	1	40	3
			108

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Technical Electives
7031 Computer Programming (Fortran)
7040 Industrial Supervision & Management
7152 Hydraulics & Pneumatics II
7150 Machine Design
7159 Manufacturing Methods & Cost Control
7160 Microprocessor Interfacing

Mechanical Design Engineering Technology

The Mechanical Design program prepares the graduate for careers that range from detail drafting to layout and design of mechanical systems. After graduation, and with experience, graduates are now holding responsible jobs as designers and supervisors. Others have gone on to complete a four-year baccalaureate degree program.

Industry looks for people with knowledge of scientific theory and with mathematical skills to help solve technical problems that arise in many areas of design and manufacturing. The co-op experience helps provide the practical experience to go with the theory which adds to a graduate's employability.

A student prepares for the Mechanical Design field by completing a curriculum which places emphasis on mathematics, science and technical subjects. Science and technical courses are taught with laboratory experiences of measurement, observation and report writing. The "hands-on" laboratory experience becomes part of a student's skills and knowledge.

Mechanical Design Engineering Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September & November)			
1001 Communication Skills I	3	0	3
*1191 Algebra & Trigonometry I	4	0	4
2291 Physics I - Kinematics & Dynamics	3	2	3
7010 Engineering Drawing	2	4	3
7111 Engineering Materials	3	2	3
7030 Computer Programming (Basic)	2	2	3
7000 Engineering Tech Orientation	1	0	1
	18	10	20
■ First Co-op Term			
9401 Cooperative Employment	1	40	2
■ Second School Term (January & April)			
1002 Communication Skills II	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2292 Physics II - Mechanics & Heat	3	2	3
7104 Machine Tools & Manufacturing Processes	3	3	3
7013 Descriptive Geometry	2	2	3
7142 Mechanisms Analysis	3	2	3
	18	9	19
■ Second Co-op Term			
9402 Cooperative Employment	1	40	2
■ Third School Term (June & September)			
1513 Macroeconomics	3	0	3
1193 Functions & Introduction to Calculus	4	0	4
2293 Physics III - Electromagnetic Waves	3	2	3
7140 Strength of Materials	4	2	4
7708 Electrical Fundamentals & Controls	4	2	4
	18	6	18
■ Third Co-op Term			
9403 Cooperative Employment	1	40	3

■ Fourth School Term (November & January)				
1020	Effective Speaking	3	0	3
1021	Human Relations	3	0	3
7141	Design Economics	2	2	3
7135	Fluid Power Systems	4	4	4
7150	Machine Design	4	2	4
7---	Technical Elective			3
				20
■ Fourth Co-op Term				
9404	Cooperative Employment	1	40	3
■ Fifth School Term (April & June)				
1010	Technical Writing	3	0	3
15--	Non-tech Elective	3	0	3
7149	Computer Applications (CNC-NC)	2	2	3
7155	Machine & Product Design	4	2	4
7151	Tool Engineering Design	3	2	3
7---	Technical Elective			3
				19
■ Fifth Co-op Term				
9405	Cooperative Employment	1	40	3
				109

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Technical Electives

7031 Computer Programming (Fortran)
7040 Industrial Supervision & Management
7113 Material Processes & Fabrication
7121 Metallurgy of Materials
7301 Introduction to Plastic Processes
7160 Microprocessor Interfacing

Engineering Technology Certificate Programs

The objective of the certificate programs is to provide a logical course of study which leads toward entry level qualifications in specific career areas. These one-year programs are all designed to apply toward a related associate degree program.

Many people who attend college are also working full or part-time. Often times the idea of attending college for two or more years to obtain the associate degree seems unattractive. By selecting a sequence of courses as suggested in CTC's certificate programs, students may continue to work at their present jobs while taking courses in preparation for their career changes and/or advancement.

Upon completion of the certificate programs the student receives a certificate indicating completion of that program. The courses in the certificate program are directly transferrable to a related associate degree program if the student elects to go on for the associate degree.

In the term preceding the one in which the student intends to complete the certificate program, the student is required to complete a petition which announces the intention to complete the program. This petition may be obtained and filed with the College Registrar.

Air Conditioning/Heating Certificate Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First Term				
1001	Communication Skills I	3	0	3
*1171	Technical Mathematics I	4	0	4
7008	Basic Engineering Drawing	2	4	3
7510	Elements of Refrigeration	4	2	5
7701	Electrical Fundamentals I	3	2	3
		16	8	18
■ Second Term				
1172	Technical Mathematics II	4	0	4
15--	Non-tech Elective	3	0	3
2291	Physics I - Kinematics & Dynamics	3	2	3
7016	Engineering Graphics (Sheet Metal Layout)	2	2	3
7520	Elements of Heating	3	2	3
7702	Electrical Fundamentals II	3	2	3
		18	8	19
■ Third Term				
10--	Communication Skills Elective	3	0	3
7530	Air Conditioning Principles I	3	2	3
7531	Air Conditioning Applications	3	2	3
7532	Sheet Metal Installation Techniques	2	2	3
7552	Air Conditioning Controls I	3	2	3
		14	8	15
				52

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Communication Skills Electives

If 1001 first: 1002 or 1009
If 1002 first: 1007 or 1009
1020 Effective Speaking
1021 Human Relations

Drafting Certificate Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First Term				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trigonometry I	4	0	4
7010	Engineering Drawing	2	4	3
7111	Engineering Materials	3	2	3
7030	Computer Programming (Basic)	2	2	3
		14	8	16
■ Second Term				
1192	Algebra & Trigonometry II	4	0	4
15--	Non-tech Elective	3	0	3
2291	Physics I - Kinematics & Dynamics	3	2	3
7013	Engineering Graphics (Descriptive Geometry)	2	2	3
7132	Hydraulics & Pneumatics I	3	2	3
		15	6	16
■ Third Term				
10--	Communication Skills Elective	3	0	3
2292	Physics II - Mechanics & Heat	3	2	3
7012	Engineering Graphics III	2	4	3
7147	Tool, Jig & Fixture Design	3	2	3
7---	Technical Elective			3
7708	Electrical Fundamentals & Controls	4	2	4
				19
				51

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Communication Skills Electives

If 1001 first: 1002 or 1009
If 1002 first: 1007 or 1009
1020 Effective Speaking
1021 Human Relations

Fabrication Certificate Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First Term				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trigonometry I	4	0	4
7008	Basic Engineering Drawing	2	4	3
7111	Engineering Materials	3	2	3
7030	Computer Programming (Basic)	2	2	3
7811	Welding Processes & Techniques	3	3	3
		18	11	19
■ Second Term				
1192	Algebra & Trigonometry II	4	0	4
15--	Non-tech Elective	3	0	3
2291	Physics I - Kinematics & Dynamics	3	2	3
7017	Steel Fabrication	2	2	3
7821	Fabrication Processes & Techniques I	3	3	3
		15	7	16
■ Third Term				
10--	Communication Skills Elective	3	0	3
7040	Industrial Management & Supervision	3	0	3
7831	Fabrication Processes & Techniques II	3	3	3
7708	Electrical Fundamentals & Controls I	4	2	4
7---	Technical Elective			3
				16
				51

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Communication Skills Electives

If 1001 first: 1002 or 1009
If 1002 first: 1007 or 1009
1020 Effective Speaking
1021 Human Relations

Machine Tool & Processes Certificate Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First Term				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trigonometry I	4	0	4
7008	Basic Engineering Drawing	2	4	3
7104	Machine Tool & Manufacturing Processes	3	3	3
7111	Engineering Materials	3	2	3
7301	Introduction to Plastic Processes	3	2	3
		18	11	19
■ Second Term				
1192	Algebra & Trigonometry II	4	0	4
15--	Non-tech Elective	3	0	3
2291	Physics I - Kinematics & Dynamics	3	2	3
7030	Computer Programming (Basic)	2	2	3
7113	Materials Processes & Fabrication	4	2	4
		16	6	17
■ Third Term				
10--	Communication Skills Elective	3	0	3
7040	Industrial Management & Supervision	3	0	3
7149	Computer Applications (CNC & NC)	2	2	2
7708	Electrical Fundamentals & Controls	4	2	4
7159	Manufacturing Methods & Cost Control	3	2	3
7---	Technical Elective			3
				18
				54

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Communication Skills Electives

If 1001 first: 1002 or 1009
If 1002 first: 1007 or 1009
1020 Effective Speaking
1021 Human Relations

Plant Engineering Services Certificate Curriculum

		Hours Per Week Class	Lab	Credit Hours
■ First Term				
1001	Communication Skills I	3	0	3
*1191	Algebra & Trigonometry I	4	0	4
7008	Basic Engineering Drawing	2	4	3
7501	HVAC Principles & Applications I	3	2	3
7701	Electrical Fundamentals	3	2	3
		15	8	16
■ Second Term				
1192	Algebra & Trigonometry II	4	0	4
1021	Human Relations	3	0	3
2291	Physics I - Kinematics & Dynamics	3	2	3
7132	Hydraulics & Pneumatics I	3	2	3
7702	Electrical Fundamentals II	3	2	3
7---	Technical Elective			3
				19
■ Third Term				
10--	Communication Skills Elective	3	0	3
7040	Industrial Management & Supervision	3	0	3
7152	Hydraulics & Pneumatics II	1	2	2
7758	Industrial Motors & Controls	3	2	3
7---	Technical Elective			3
7735	Elements of Power Electronics	3	2	3
				17
				52

*A competency-based math test will be administered to all entering Engineering Technology students. Its purpose is to start students into a math sequence which is more compatible to their level of experience and aptitude.

Recommended Communication Skills Electives

If 1001 first: 1002 or 1009
If 1002 first: 1007 or 1009
1020 Effective Speaking
1021 Human Relations

Physical Science and Mathematics Division

Division faculty have been selected for their dedication and academic preparation to fulfill the two major functions of the division:

- teaching the principles of physics, chemistry and mathematics considered basic for successful study in a science dependent field such as engineering technology, health

or technical business services
- providing in-depth instruction in the applied sciences leading the student to a career in either technical laboratory and materials testing or laser-electro-optic systems.

It is important to note that course recommendations in physical science and mathematics at CTC are determined by the readiness of each student. Readiness is determined during the admissions process through testing and an interview. Faculty are chosen for their ability to communicate effectively with students, for their knowledge of subject matter as well as for their experiences in business and industry. As a result, the chances for student success in physics, chemistry and mathematics are greatly enhanced.

Mathematics Placement Service

Since it is not unusual for a college student to experience math anxieties as he or she faces a technical career, the mathematics department is happy to offer the services of a mathematics placement test designed for the specific type of technology of interest to the student. The placement test is designed to be a placement tool and students are strongly encouraged to take advantage of this service before registration occurs. There is no charge for the test. The results of the test assist the student in choosing a sequence of math courses suited to his or her skill development as well as being related to his or her technology major.

Each sequence of mathematics courses is tailored to meet the desired needs of the technology it serves and to provide additional skills as elected by the student. The sequences of courses and the technologies served are as follows:

Developmental Sequence of Courses Serving All Technologies:
0020 Basic Mathematics I
0022 Essentials of Mathematics
0024 Basic Algebra I
0025 Basic Algebra II
1131 College Algebra
1132 Statistics

Sequence of Courses Serving Health Technologies:
1150 Introduction to Science Mathematics
1151 Science Mathematics I
1152 Science Mathematics II

Sequence of Courses Serving Business Technologies:
1120 Introduction to Business Mathematics
1121 Business Mathematics
1122 Financial Analysis
1123 Electronic Financial Analysis
1125 Business Calculus

Sequence of Courses Serving Computer Programming Technologies:
1140 Introduction to Linear Algebra
1141 Matrix Algebra
1142 Probability & Introduction to Quantitative Analysis
1143 Quantitative Approach to Operations Research

Sequences of Courses Serving Engineering Technologies:
1170 Introduction to Technical Mathematics
1171 Technical Mathematics I
1172 Technical Mathematics II
1173 Technical Mathematics III
1179 Technical Statistics
(or students may begin the sequence at the following level)
1191 Algebra & Trigonometry I
1192 Algebra & Trigonometry II
1193 Functions in & Introduction to Calculus
1194 Differential & Integral Calculus
1195 Differential Equations

Sequences of Courses Serving Physical Science Technologies:
1170 Introduction to Technical Mathematics
1171 Technical Mathematics I
1172 Technical Mathematics II
1173 Technical Mathematics III
(or students may begin the sequence at the following level)
1191 Algebra & Trigonometry I
1192 Algebra & Trigonometry II
1193 Functions in & Introduction to Calculus
1194 Differential & Integral Calculus
1195 Differential Equations

Physics, chemistry and mathematics are, of necessity and tradition, laboratory sciences. Many students cannot know without doing. Actual observation and manipulation allow physical laws, concepts and hypotheses to take on real meaning in the mind of the student. The science division therefore places much emphasis on the laboratory. Care is taken to ensure all laboratories are well supplied with equipment. The laboratory experiences, pointing the way for students, assist them to organize an attack on the problem, encourage the students to use their own ingenuity and thoughts while carrying the investigation to a conclusion; and, finally, prepare a report of the findings.

For the student who relates strongly to the applied sciences, skilled faculty are pround to offer degree programs focusing on the latest information and techniques leading to careers in technical laboratory and materials testing services or in the dynamic new field of laser-electro-optic systems.

Developmental Science Courses Serving All Technologies:
0030 Basic Concepts Biology
0031 Basic Concepts Chemistry
0035 General Science
2200 Basic Chemistry
2270 Introductory Laboratory Science

Laser/Optics Technology

Laser devices continue to enjoy rapid acceptance in modern industry. The laser is a unique source of radiation capable of delivering an intense, coherent electromagnetic field. Since the first lasing in 1960, the laser has proven to be an effective tool in numerous industrial applications. High power solid state and gas lasers can be effectively used to cut, trim, weld, drill and scribe an infinite number of materials for an almost infinite number of applications.

The following are just a few of the industries using lasers: building construction, surveying, medical treatment, materials processing, measurement and testing, garment, military and space systems, pollution monitors, data processing, communications, research and holography. The usefulness of the laser and its rapid acceptance as an industrial tool have created a shortage of technicians trained in this field.

CTC's Laser/Optics program, the first in Ohio and one of the few programs in the country, trains students to meet this shortage. Students are instructed on laser theory, optics, laser devices, components and applications as well as physics, mathematics and communication skills.

Graduates of the Laser/Optics program are qualified to work as technicians in any of the numerous industries or research laboratories making use of laser/optics.

Laser/Optics Technology Curriculum

Prerequisites: Three years high school math including algebra & trigonometry. One year of physics or chemistry or the equivalent.	Hours Per Week Class	Lab	Credit Hours
■ **First Term**			
1001 Communication Skills I	3	0	3
*1191 Algebra & Trigonometry I	4	0	4
2291 Physics I - Kinematics & Dynamics	3	2	3
6710 Laser-Optics I	3	3	5
7710 D.C. Circuits Analysis	6	3	5
	19	8	20

■ Second Term			
9401 Cooperative Employment	1	40	2
■ Third Term			
1002 Communication Skills II	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2292 Physics II - Mechanics & Heat	3	2	3
6720 Laser-Optics II	3	3	5
7720 A.C. Circuits Analysis	6	3	5
	19	8	20
■ Fourth Term			
9402 Cooperative Employment	1	40	2
■ Fifth Term			
1020 Effective Speaking	3	0	3
1193 Functions in & Introduction to Calculus	4	0	4
1513 Macroeconomics	3	0	3
6730 Laser-Optics III	3	3	5
7730 Electronics I	5	5	5
	18	8	20
■ Sixth Term			
9403 Cooperative Employment	1	40	3
■ Seventh Term			
1020 Human Relations	3	0	3
1134 Fortran Programming	3	2	3
6740 Laser-Optics IV	3	3	5
7740 Electronics II	4	2	4
---- Elective	3	2	
	16	9	15
■ Eighth Term			
9404 Cooperative Employment	1	40	3
■ Ninth Term			
1010 Technical Writing	3	0	3
15-- Non-tech Elective	3	0	3
6750 Laser-Optics V	3	3	5
7750 Electronics III	4	2	4
---- Elective	3	2	
	16	7	15
■ Tenth Term			
9405 Cooperative Employment	1	40	3
			103

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Recommended Electives with advisor's permission
1194 Differential & Integral Calculus
2294 Physics IV - Atomic & Nuclear
6999 Laser-Optic Project
7031 Computer Programming (Fortran)
4011 General Anatomy
7103 Machine Processes I
7731 Digital Systems I
7741 Digital Systems II
7751 Digital Systems III
4501 Introduction to Surgery

Technical Laboratory Careers Scientific Measurement and Testing Technology

The Scientific Measurement and Testing Technology is an educational and training program designed to prepare a person to work as a laboratory technician in a scientific or industrial laboratory in which the physical properties of materials are measured.

Classroom, laboratory and-normally-cooperative employment experiences give each student education and training for working with mechanical, electrical, chemical, optical and thermal systems as these systems apply to the measurement and testing of materials.

The program prepares the successful student for possible employment in laboratories designed for quality control, research, product development, monitoring and materials testing in such varied industries as the automotive, aviation, beverage, chemical, cosmetic, detergent, fertilizer, food processing, glass, graphics, packaging, paint, paper, petroleum, plastics, rubber, soap, steel and the textile industry.

Courses in engineering graphics, computer programming, communication skills and social sciences augment the courses in mathematics, physical sciences and technical instrumentation to give the student technician the background needed to be a member of an effective technical team.

Working as a well-prepared laboratory technician includes the applying of concepts from mathematics and the laboratory sciences to the planning and execution of tests and to the taking, recording, compiling and reporting of measurement data.

Scientific Measurement & Testing Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First Term			
1002 Communication Skills II	3	0	3
*1191 Algebra & Trigonometry I	4	0	4
15-- Non-tech Elective	3	0	3
2291 Physics I - Kinematics & Dynamics	3	2	3
6611 Technical Laboratory Chemistry I	3	3	4
7008 Basic Engineering Drawing	2	4	3
	18	9	20
■ Second Term			
9401 Cooperative Employment	2	40	2
■ Third Term			
1007 Research & Logic	3	0	3
1192 Algebra & Trigonometry II	4	0	4
2292 Physics II - Mechanics & Heat	3	2	3
6621 Technical Laboratory Chemisry II	3	3	4
6629 Science of Materials	3	2	4
	16	7	18
■ Fourth Term			
9402 Cooperative Employment	2	40	2
■ Fifth Term			
1179 Technical Statistics	4	0	4
2293 Physics III - Electromagnetic Waves	3	2	3
6631 Technical Laboratory Chemistry III	3	3	4
6639 Instrumentation & Measurement	3	2	4
7708 Electrical Fundamentals & Controls	4	2	4
	17	9	19
■ Sixth Term			
9403 Cooperative Employment	3	40	3
■ Seventh Term			
1010 Technical Writing	3	0	3
1193 Functions in & Introduction to Calculus	4	0	4
6649 Materials Testing	3	4	5
7031 Computer Programming (Fortran)	2	2	3
7441 Quality Control	3	2	3
	15	8	18
■ Eighth Term			
9404 Cooperative Employment	3	40	3
■ Ninth Term			
1020 Effective Speaking	3	0	3
1194 Differential & Integral Calculus	4	0	4
15-- Non-tech Elective	3	0	3
15-- Non-tech Elective	3	0	3
6659 Analysis of Materials Project	3	4	5
7--- Technical Elective	3	2	3
	19	6	21

■ **Tenth Term**

9405 Cooperative Employment	3	40	3
			109

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Suggested Technical Electives

1722 Basic Language Programming
2294 Physics IV - Atomic & Nuclear
6710 Laser Theory I
7132 Hydraulics & Pneumatics I
7145 Statics & Strength of Materials
7730 Electronics I
7731 Digital Systems I
7740 Electronics II

Associate of Individualized Study

The Cincinnati Technical College has been offering career education since its inception in 1966.

As the college has increased in enrollment and in its involvement with the community, it has expanded its offerings from the four original programs to 42 degree programs and options today. even with this expansion of offerings it has not been possible to satisfy fully the individual career preparation or course advancement needs of many who have applied.

To maximize the College's ability to meet particular career education needs, CTC offers the Associate of Individualized Study program. This program allows for the consideration of total individual educational needs and, in cooperation with career consultants from the business/industrial community, provides planning for an A.I.S. program to respond to those needs.

Who Should Apply

The A.I.S. program will be attractive to anyone whose career education objectives cannot readily be met through one of the more structured associate degree programs offered by the College. In order to be admitted the applicant must meet the following requirements:

1. Submit written justification for admission to this degree program in preference to one of the other associate degree programs and options available at the College.

2. Demonstrate a level of maturity and motivation which gives promise of success in handling the responsibilities inherent in such a program.

3. Satisfy the general admissions requirements of the Cincinnati Technical College.

4. Demonstrate at least a minimal academic aptitude by completing a minimum of six quarter college credit hours with an average of "C" or better at either CTC or another recognized institution of higher education.

5. Declare candidacy for the program at such time as the minimum six quarter college credit hours have been accumulated.

6. At the time of candidacy, plan an acceptable curriculum which must meet the approval of the A.I.S. Approval Committee.

Final approval of an A.I.S. program must be granted by the Associate of Individualized Study Review Committee. (This committee consists of division deans and the Director of the A.I.S. program.)

All advising will be coordinated by an assigned A.I.S. advisor. The applicant will receive counsel from professionals in business/industry and appropriate members of the CTC staff.

For additional information on the Associate of Individualized Study program contact the Director of Extended Services and A.I.S. program.

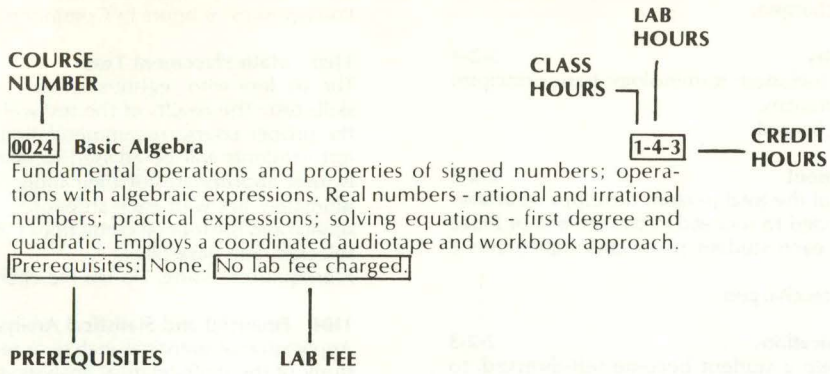
COURSE DESCRIPTIONS

CATALOG 81-82

COURSE DESCRIPTIONS

CATALOG 81-82

Understanding Course Descriptions



Course Number: identifying code for each course in a curriculum.

Class Hours: number of hours per week of lecture or individualized instruction.

Lab Hours: number of hours per week in laboratory instruction. Lab hours are usually in addition to class hours.

Credit Hours: academic credit awarded for successful completion of the course.

Prerequisites: any course(s) which must be successfully completed before a student may enroll in the course.

Co-requisites: any course(s) which must be taken at the same time or at a previous time as the course listed.

Lab Fees: a fee in addition to the regular tuition which covers the cost of laboratory supplies for a particular course. A listing of current lab fees is available in the division offices.

0001 English Grammar **2-3-3**
This course deals with the words and language of the grammatical system of standard English. Correct usage is stressed.
Prerequisites: None. No lab fee charged.

0002 College Spelling **1-2-2**
An individualized spelling improvement program. Uses multisensory approach to develop desirable spelling attitudes and habits. Also stresses word analysis and proofreading.
Prerequisites: None. No lab fee charged.

0003 Basic Writing I **2-3-3**
After an analysis of strengths and weaknesses in writing, student is given instruction and practice in the construction of clear, error-free sentences and messages.
Prerequisites: 0001 or equivalent. No lab fee charged.

0004 Basic Writing II **2-3-3**
Emphasizes paragraph organization and transitional devices in longer composition; punctuation.
Prerequisites: 0003 or equivalent. No lab fee charged.

0007 Telephone Techniques **1-1-1**
Develops confidence and accuracy in the use of the telephone for business. Stresses clarity and enunciation.
Prerequisites: None. No lab fee charged.

0008 Oral Reports **2-1-2**
Enlarges student's concept of skill in oral communication. Provides means for each student to develop clear and accurate reports.
Prerequisites: 0003 or equivalent. No lab fee charged.

0010 College Reading I **1-4-3**
Instruction and practice to develop flexibility in reading, improve vocabulary; and sharpen comprehension. Diagnostic and prescriptive testing; individualized, multi-media.
Prerequisites: None. No lab fee charged.

0011 College Reading II **1-4-3**
Continuation of 0010. Recommended for students needing further improvement in reading skills.
Prerequisites: 0010 or equivalent. No lab fee charged.

0012 Technical Reading I **2-3-3**
Develops skills and vocabulary needed to succeed in a particular technology through an individualized curriculum drawn from the reading required. Emphasizes purposeful reading.
Prerequisites: 0010 or equivalent. No lab fee charged.

0013 Technical Reading II **2-3-3**
Continuation of 0012. Recommended for students needing further instruction and practice. Emphasizes finding information and following written directions.
Prerequisites: 0012. No lab fee charged.

0014 College Study Skills **3-1-3**
A comprehensive course for the student who would like to get the most out of his or her courses. Attention is given to the development of positive attitudes toward good study habits and self-improvement of basic study skills (such as note-taking, memory, preparing for examinations). Individualized.
Prerequisites: None. No lab fee charged.

0020 Basic Mathematics I **1-4-3**
Individualized instruction and practice in the fundamental skills of mathematics. Assignments for each student as determined by diagnostic test. Topics available: whole numbers and related operations, primes, composites, factoring, common fractions, decimals, percent.
Prerequisites: None. No lab fee charged.

0021 Basic Mathematics II **1-4-3**
Continuation of 0020. Recommended for students needing further instruction and practice in computation and application.
Prerequisites: 0020. No lab fee charged.

0022 Essentials of Mathematics **3-6-6**
A review of mathematical principles and computations. Individualized instruction and practice in the fundamental skills of mathematics. Assignments determined by diagnostic testing. Basic topics available: whole numbers, common fractions, decimals, percent, metric system.
Prerequisites: None. No lab fee charged.

0024 Basic Algebra I **1-4-3**
Fundamental operation and properties of signed numbers. Operations with algebraic expressions. Real numbers - rational and irrational numbers. Practical expressions, solving equations - first degree and quadratic, graphing. Employs a coordinated audiotape and workbook approach.
Prerequisites: None. No lab fee charged.

0025 Basic Algebra II **1-4-3**
Continuation of 0024. Recommended for students needing further instruction and practice.
Prerequisites: 0024. No lab fee charged.

0030 Basic Concepts Biology 3-2-4
A survey of the study of life processes. Included: terminology, basic principles of biology, laboratory experiences.
Prerequisites: None. Lab fee charged.

0031 Basic Concepts Chemistry 3-2-4
A survey of general chemistry. Included: terminology, basic principles of chemistry, laboratory experiences.
Prerequisites: None. Lab fee charged.

0040 Interpersonal Development 2-2-3
Focuses on the development of the total person; develops an awareness of the personal skills needed to succeed in college and of those habits which inhibit success; each student plans and implements a workable schedule for self.
Prerequisites: None. No lab fee charged.

0041 Interpersonal Communications 2-2-3
This course is designed to help a student become self-directed, to become aware of the role of assertion in the communication process, to improve interpersonal and organizational skills and to develop as a mature, articulate, self-assured person.
Prerequisites: None. No lab fee charged.

0050 Orientation to Business 3-0-3
A basic introduction to the language, principles and practices of business. The course is designed to introduce students to the very basic elements of business.
Prerequisites: None. No lab fee charged.

1001 Communication Skills I 3-0-3
Syntax, the composition of clear and effective sentences and paragraphs, usage, and the development of a basic technical vocabulary.
Prerequisites: None. No lab fee charged.

1002 Communication Skills II 3-0-3
Usage, especially pronouns, verbs, adjectives, and adverbs; the composition of a theme; the standard use of certain punctuation marks; principles of research techniques.
Prerequisites: 1001 Recommended. No lab fee charged.

1007 Research and Logic 3-0-3
Organization and development of argumentative writing, including research and logical and fallacious reasoning.
Prerequisites: 1002 or equivalent. No lab fee charged.

1009 Business English 3-0-3
Current practices in business communication; accuracy is stressed in the areas of grammar, mechanics, usage, spelling, and syntax.
Prerequisites: 1001 recommended. No lab fee charged.

1010 Technical Writing 3-0-3
The principles and practices of various types of business correspondence including the letter of application and resume; audience analysis; visuals; various technical communications such as procedures, explanation of process, mechanism description, formal and informal reports.
Prerequisites: 6 credit hours of composition. No lab fee charged.

1011 Business Communications 3-0-3
The principles and practices of the more common types of business correspondence; informal and formal business reports; development of style.
Prerequisites: 6 credit hours of composition. No lab fee charged.

1020 Effective Speaking 3-0-3
The preparation and delivery of various types of speeches. Improved listening techniques, audience participation, and evaluation are stressed.
Prerequisites: None. No lab fee charged.

1021 Human Relations 3-0-3
Applies psychological principles to everyday life. These applications help students understand themselves better, change their behaviors, and enhance their interpersonal relationships. The students must participate in structured experiences. Can be applied for Social Science Credit.
Prerequisites: None. No lab fee charged.

1099 Special Problems in Communication Skills 1-5—0—1-5
Individual study and special projects pertaining to the particular technology in which the student is enrolled. Open to students wishing advanced standing, independent study, and/or research. This course is arranged with the Instructor with the approval of the Dean of the Communication Skills Division.
Prerequisites: 6 hours in Communication Skills. No lab fee charged.

1100 Math Placement Test 0-1-4
The student who registers for this test will take a basic mathematics skills test. The results of the test will enable a faculty advisor to make the proper course recommendation for each student. Following the test, students will be advised to take the mathematics course which is most appropriate for their individual skill level. The final decision ultimately lies with each student. There is no additional fee for this service and the four (4) credit hour tuition will be credited to the course selected. See page 58.
Prerequisites: None. No lab fee charged.

1104 Financial and Statistical Analysis 4-0-4
Application of statistical analysis as related to business and an in-depth study of the mathematical analysis of business financial information.
Prerequisites: None. No lab fee charged.

1120 Introduction to Business Mathematics 4-0-4
A review of the basic computational skills needed for success in business mathematics, especially those involving fractions, decimal fractions and ratios. Applied topics such as payroll, present value, simple interest, mark up, work down, etc. Use of an electronic calculator having the floating decimal point is encouraged. Students should register for this course after taking the math placement test. See page 58.
Prerequisites: 0020 or equivalent. No lab fee charged.

1121 Business Mathematics 4-0-4
A review of introductory topics such as payroll present value, simple interest, mark up, mark down, Mathematics of business and banking to include promissory notes, trade and cash discounts, inventories, taxes, compound interest, finance charges. Use of an electronic calculator having the floating decimal point is encouraged.
Prerequisites: 1120 or equivalent. No lab fee charged.

1122 Financial Analysis 4-0-4
Review of discounts and taxes, compound interest, present value, revolving charges. Annual percentage rate, depreciation, mortgages, amortization, insurance.
Prerequisites: 1121 or the equivalent. No lab fee charged.

1123 Electronic Financial Analysis 4-0-4
Qualitative and quantitative graphs, data, etc. Stocks, bonds, and annuities. Common business, investment and banking, financial calculations, trends and forecasts taught through the use of an advanced business analyst electronic calculator. Executive guidebook accompaning the calculator is used as the text for the course.
Prerequisites: Business Mathematics or Accounting. No lab fee charged.

1125 Business Calculus 4-0-4
Functions and calculus with application to business and the social sciences. Decision making involving maximum or minimum conditions. Derivatives and antiderivatives.
Prerequisites: Algebra. No lab fee charged.

1131 College Algebra 4-0-4
This course presents important algebraic relationships that provide supportive skills for all students in technical programs dependent on algebra.
Prerequisites: Previous course work in algebra. No lab fee charged.

1132 Statistics 4-0-4
Mean, median and mode. Central tendencies and standard deviation. Frequency distributions. Confidence levels and decision making.
Prerequisites: Algebra. No lab fee charged.

1133 Basic Programming 3-2-3
Principles of programming, charting and coding in Basic language. Basic language is used as a problem solving tool.
Corequisites: 1171 or 1191. Lab fee charged.

1134 Fortran Programming 3-2-3
The optimizing blocking factors used for both magnetic tape and magnetic disk. Introduction to linear programming and forecasting. The discussions of searching lists and sorting techniques. Fortran language is used as a problem-solving tool.
Prerequisites: None. Lab fee charged.

1140 Introduction to Linear Algebra **4-0-4**
Review of the basic laws of algebra. Polynomials, quadratics, exponents and roots. Linear equations and inequalities. Sets and set operations. Linear and polynomial functions. Students should register for this course after taking the math placement test. See page 58.
Prerequisites: 0024 or equivalent. No lab fee charged.

1141 Matrix Algebra **4-0-4**
Selected topics from business and banking applicable to matrix modeling. Matrix operations. Systems of linear functions. Systems of linear inequalities. Linear programming techniques.
Prerequisites: 1140 or equivalent. No lab fee charged.

1142 Probability and Introduction to Quantitative Analysis **4-0-4**
Definition of Qualitative analysis, its development and typical applications. Probability, basic concepts, classical, conditional, Bayes theorem, expectations, binomial distribution. Normal distribution, definition of quantitative analysis, introduction to decision making. Forecasting, data analysis.
Prerequisites: 1140 or equivalent. No lab fee charged.

1143 Quantitative Approach to Operations Research **4-0-4**
Decision Theory, Model Construction: network, transportation, simplex and other programming, dynamic programming, queuing, Markov analysis, past, present, future methods.
Prerequisites: 1141 and 1142 or equivalent. No lab fee charged.

1150 Introduction To Science Mathematics **4-0-4**
Fundamental skills of mathematics as applied to the Allied Health profession: interpretation of data and calculations, decimals, fractions, ratios and proportions, percents; measurement calculations and conversions: English, metric, S.I., Apothecary, household, temperature, medical dosages, concentrations, etc. See page 58.
Prerequisites: Math Placement Test. No lab fee charged.

1151 Science Mathematics I **4-0-4**
Arithmetic calculations: accuracy, precision, signed numbers, decimals, scientific notation, empirical data, dimensional unit conversions, proportions, formulas. Linear algebra. Quadratic formula. Right triangle Trigonometry. Logarithms. Statistics. Applications selected from chemical and physical topics: length, area, volume, density, specific gravity, mole, molarity molality, normality, PH, pOH, atomic weights, force vectors and bone/muscle structure, traction, light and optics, refraction, radioactive half life, half layer value, etc. Students should expect to use scientific calculators.
Prerequisites: 1150 or equivalent. No lab fee charged.

1152 Science Mathematics II **4-0-4**
A continuation of the mathematics and applied topics presented in course 1151. Skill development is to include topics from densities, logarithmic data, bone and muscle systems as modeled through force analysis, geometrical considerations involved in optical instrumentation, balancing nuclear reactions, radiation levels as modeled through the inverse square law. Students should expect to utilize scientific electronic calculators.
Prerequisites: 1151. No lab fee charged.

1170 Introduction to Technical Mathematics **4-0-4**
Calculations using signed numbers, decimals, roots, powers, scientific notation, empirical data, dimensional unit conversions, proportions, formulas. Manipulation of formulas and equations. Reading and using various measuring devices. Deciphering angular and parallel relationships. Using geometric and trigonometric relationships. Applications using the tools of many Engineering Technologies: diagrams, formulas, graphs, meters, micrometers, calipers, etc. Students should expect to purchase a scientific calculator for the second half of the course. See page 58.
Prerequisites: 0020, 0024 or equivalent. No lab fee charged.

1171 Technical Mathematics I **4-0-4**
Order of calculation, scientific notation, rounding off, measurement conversions, formula and equation manipulation, ratio and proportion, direct and inverse variation, area and volume calculation, simultaneous equations, similar triangles and right triangle trigonometry. Applications on the Ohm's Law, pulley and gear speed ratios, horsepower, torque, tapers, components of forces, etc. Students in this sequence should expect to use a scientific calculator.
Prerequisites: 1170 or equivalent. No lab fee charged.

1172 Technical Mathematics II **4-0-4**
Logarithic and exponential functions, Law of Sines, Law of Cosines, complex number operations, the quadratic equation, force and phasor systems, applications include concepts from 1171, Kirchoff's Laws, mechanical systems in equilibrium, density, specific gravity, area and volume viewed as functions of dimensions, radian-degree conversions, interpolation of tabular data, etc.
Prerequisites: 1171. No lab fee charged.

1173 Technical Mathematics III **4-0-4**
Introduction to Analytic Geometry, manipulation and graphical analysis of trigonometric, logarithmic, quadratic, power functions, etc. Three dimensional functions and figures, Statistics, Introduction to boolean Algebra (optional). Applications using Gas Laws, power ratio/decibel conversions, A.C./D.C. circuit analysis, empirical data analysis.
Prerequisites: 1171, 1172. No lab fee charged.

1179 Technical Statistics **4-0-4**
Organization of data including mean, mode, median, standard deviation, Chebyshev's Theorem and Z-Scores; measurement of uncertainty and the analysis of uncertainty principles utilizing experimental data; estimating the mean and choosing sample size; testing statistical hypotheses, experimental data relationships including curve-fitting and regression techniques; conditional probability and independent events; the analysis of variance and non-parametric tests.
Prerequisites: 1171 or equivalent. No lab fee charged.

1191 Algebra and Trigonometry I **4-0-4**
Order of calculations, meaning of equations, trigonometric ratios, oblique triangle trig, geometric design, equation manipulation, exponents and roots, simultaneous linear equations, simultaneous second degree equations. Some applications using series and parallel circuits, forces on mechanical systems. Students enrolled in this course should expect to utilize an electronic calculator having Scientific Notation, Trig and Log functions. See page 58.
Prerequisites: 1170 or equivalent. No lab fee charged.

1192 Algebra and Trigonometry II **4-0-4**
Common logarithms and natural logarithms, exponential equations, Trigonometric graphs, identities and equations, direct and inverse variation, quadratics, complex numbers, introduction to Boolean Algebra. Applications to power conversions, radian-degree conversions, pulley and gear speed-ratios, vibrations, resolutions of logic networks. Students enrolled in this course should expect to utilize an electronic calculator having Scientific Notation, Trig and Log functions.
Prerequisites: 1191. No lab fee charged.

1193 Functions and Introduction to Calculus **4-0-4**
Graphs of first and second degree functions, empirical curve fitting, introduction to statistics, limit concept, derivatives. Some applications using analysis of dimensions, heat, time, etc., maxima and minima. Students enrolled in this course should expect to utilize an electronic calculator having Scientific Notation, Trig and Log functions.
Prerequisites: 1192. No lab fee charged.

1194 Differential and Integral Calculus **4-0-4**
Derivatives, differentials, integrals, tecnhiques of integration, volumes. Applied calculus with emphasis upon applications in mechanical and electrical fields. Students enrolled in this course should expect to utilize an electronic calculator having Scientific Notation, Trig and Log functions.
Prerequisites: 1193. No lab fee charged.

1195 Differential Equations **4-0-4**
This course emphasizes the calculations and techniques that are used to set up and solve problems modeled with differential equations. The solution techniques are always calculus techniques using various methods of differentiation and integration. Students enrolling in the course should have interests in the major areas of engineering science since the emphasis of this course is both on how to model a physical setting and how to solve the differential equation and interpret the results.
Prerequisites: 1194. No lab fee charged.

1201 Private Police Officer Training Course **4-8-8**
This complete 120-hour training course fulfills the requirements for certification for Peace Officers Training Council for Private Security Police.
Prerequisites: None. Lab fee charged.

1202 First Aid **3-0-3**
First-aid instruction including Red Cross Multi-Media Standard First-Aid course, including instructors' certification; CPR instruction, including instructors' certification.
Prerequisites: None. Lab fee charged.

1204 Personnel Security Systems **2-3-3**
All areas to be secured require organization of system, manpower and equipment. This course describes types of physical equipment needed to provide security in three lines of defense.
Prerequisites: None. No lab fee charged.

1205 Criminal Interrogation **3-0-3**
This course is an indepth study of proper interrogation procedures designed to gather information from persons.
Prerequisites: None. No lab fee charged.

1208 Criminal Law I **4-0-4**
Criminal procedure deals with the scope of all criminal rules and their applicability as established by the state of Ohio. Procedures and options of criminal justice.
Prerequisites: None. No lab fee charged.

1209 Criminal Law II **4-0-4**
This course covers all areas dealing with Ohio codes and statutes (H.B. 511).
Prerequisites: None. No lab fee charged.

1210 Introduction to Loss Control & Security Administration **3-0-3**
An overview of the significance of security and loss prevention programs in areas of industrial business and government complexes. Review of examples of effective loss control programs in existence; a study of career opportunities in the field, personnel requirements, standards, and current renumeration levels.
Prerequisites: None. No lab fee charged.

1211 Industrial Security **3-0-3**
A study of every area of industrial security . . . to recognize and prevent threats to key industry from violence, sabotage, and espionage.
Prerequisites: None. No lab fee charged.

1213 Hospital Security **3-0-3**
Develop a concept of security in the health care environment and provide sufficient operational details to make possible the establishment of a protection system or the refinement of existing systems.
Prerequisites: None. No lab fee charged.

1216 Security Administration I **3-0-3**
A study of security problem: Loss prevention to increase a business profit; areas covered include shoplifting, robbery, burglary, forgery and identification, apprehension and prosecution of people.
Prerequisites: None. No lab fee charged.

1217 Security Administration II **3-0-3**
An analysis of special internal problem areas, particularly employee theft.
Prerequisites: None. No lab fee charged.

1220 Fundamentals of Fire Protection **3-0-3**
This course deals primarily with fires, fire fighting equipment, and how to properly use or apply this equipment . . . setting up fire brigades, train, and use them.
Prerequisites: None. Lab fee charged.

1222 Financial Analysis **4-0-4**
Review of discounts and taxes, compound interest, present value, revolving charges. Annual percentage rate, depreciation, mortgages, amortization, insurance.
Prerequisites: 1121 or equivalent. No lab fee charged.

1224 Fundamentals of Fire Prevention **3-0-3**
Organization and function of the fire prevention organization; chemistry of fire; inspections, surveying and mapping procedures, recognition of fire hazards, engineering a solution of the hazards, enforcement of the solution. Public relations as affected by fire prevention efforts.
Prerequisites: 1220. Lab fee charged.

1230 Safety Management **3-0-3**
Organization of safety and accident prevention programs. Study of leading causes of business and industrial accidents. The principles of cause analysis and scientific accident prevention.
Prerequisites: None. No lab fee charged.

1233 Emergency Planning **3-0-3**
Principles governing the development of emergency plans. Problems encountered in planning for emergencies and implementing such plans. Procedures for plan development. Procedures for plan implementation. Emergencies to be covered include: bomb threat, fire, explosion, storm, riot, strike violence.
Prerequisites: None. No lab fee charged.

1234 O.S.H.A. I (Occupational Safety and Health Act) **3-0-3**
To familiarize the student with the functions, terminology, and procedures of the Occupational Safety and Health Act.
Prerequisites: None. No lab fee charged.

1235 O.S.H.A. II (Occupational Safety and Health Act) **3-0-3**
A study of the Federal Register.
Prerequisites: None. No lab fee charged.

1236 Vehicle Safety **3-0-3**
A study and analysis of the problems and practices of motor fleet and industrial vehicle safety programming and hazardous situations, such as tow motors, trucks, and forklifts.
Prerequisites: None. No lab fee charged.

1237 Safety Training Methods and Techniques **2-3-3**
To equip the student with proper techniques for teaching employees, supervisors or upper-level management who are concerned with the development of in-depth training programs. To equip the student with communication skills and the management functions of safety.
Prerequisites: None. No lab fee charged.

1238 Ergonomics **3-0-3**
The scientific approach to problems of design and construction of machines vs. man's human factors engineering. The stress of machines on the human body.
Prerequisites: None. No lab fee charged.

1240 Directed Case Study **3-0-3**
An analysis of criminal court decisions; these decisions must be reduced to a written brief by student.
Prerequisites: 1208, 1209. No lab fee charged.

1401 Layout and Design **2-0-2**
Principles of printing design and art work. Conventional layout, modern layout, type design, color usage, scaling photographs and art work, copy preparation for camera, newspaper layouts, designing folders, broadsides and booklets.
Prerequisites: None. Lab fee charged.

1402 Typography **2-6-4**
History of the alphabet; evolution and development of movable type. Methods of type setting - hand and machine composition. Copyfitting of text matter to space allocation. Basic requirements of hot metal, punched tape for cold composition (photographic and strikeon composition), hot metal and cold type display for composition.
Prerequisites: None. Lab fee charged.

1405 Proofreading and Copy Preparation **2-0-2**
Checking the typesetter's work; use of special symbols to mark changes, corrections, additions, or eliminations. How to check copy for errors. Duties of the proofreader and the copyholder. Reference books for the proofreader. Rules of syllabication of words. Acquiring speed and accuracy in proofreading.
Prerequisites: None. No lab fee charged.

1410 Machine Composition and Newspaper Designing **1-9-4**
An extended study of various typesetting machines, both magnetic tape controlled and punched tape controlled, utilizing hot metal machines. Analysis, evaluation and recommendations based on individual research in order to select the best methods for a particular kind of work. The basic operations of manually operated machines are also investigated. Fundamentals and techniques of sound newspaper designing are presented through general problems of page size, news head selection, from page make-up, illustration, etc.
Prerequisites: 1409. Lab fee charged.

1415 Graphic Arts Processes **2-3-3**
Development and evaluation of printing devices. Graphic arts processes in use today - letterpress, gravure, flexographic, offset and silk screen presses: newspaper and rotary presses. How they work, and the kinds of work for which they were designed.
Prerequisites: None. Lab fee charged.

1419 Survey of Printing Inks **3-0-3**
This course is about ink technology as it is divided into physical make-up; how its integral parts affect color, drying properties, subtrates,

cost, time; how the many printing processes use inks to each advantage.
Prerequisites: None. No lab fee charged.

1421 Cold Type Process **1-9-4**
Classification of cold type devices - hand assembled paper or plastic alphabets, dry transfer fonts; keyboard test - on paper machines; keyboarded phototypesetting; photo-lettered displays. Principles and operations of various keyboards. The use of electronics, computers, and tape operated controls.
Prerequisites: 1402. Lab fee charged.

1428 Management Survey **3-0-3**
Use of the production board in control - planning a job and following through all phases of production. Methods of hiring and firing.
Prerequisites: None. No lab fee charged.

1430 Presswork **1-9-4**
Survey and justification studies of press equipment to assist in suggesting capital expenditures for future growth and replacement cycles for letterpress, offset, and flexographic systems. Press usage and depreciation methods, replacement policies.
Prerequisites: 1410. Lab fee charged.

1440 Offset Press Operation **2-13-6**
Techniques of operation and control, study of various moistening systems, comparison of wet and dry forms of lithography. Plate comparisons to include wipe on, presensitized, albumin surface, deep etch, bi-metal, tri-metal, dycril and other synthetics, grained and grainless. Understanding the required adjustments necessary for top quality printing. Use of pressroom and quality control equipment.
Prerequisites: None. Lab fee charged.

1449 Estimating Preparation **2-3-3**
This course is designed to cover those areas in estimating in printing that require the attention of math, ie, paper, copyfitting, weight of metal, ink, spoilage, and camera calibrations.
Prerequisites: None. No lab fee charged.

1450 Estimating **2-3-3**
Determine job costs; elements of job costs - labor, materials, burden, profit and markup. Characteristics and types of paper; paper sizes; selection and purchase of paper; determining proper cuts from mill size sheets; use of manufacturers' catalogues and price books.
Prerequisites: 1161. No lab fee charged.

1460 Bindery Method/Procedures **2-3-3**
Drilling, stitching and cutting. Investigations into the more complex operations of page imposition. Automatic signature assembly and book finishing. Automatic tape operated cutters demonstrated and explained. Automatic folders with pile feed and continuous feed.
Prerequisites: None. Lab fee charged.

1480 Photolithography I **2-3-3**
Types and uses of photo-copy and process camera. General and special uses of films. Uses of precise measuring darkroom instruments. Darkroom techniques. Making line and half-tone negatives. Comparing and making single color proofs. Simple stripping.
Prerequisites: None. Lab fee charged.

1481 Photolithography II **2-3-3**
Follow-up of Photolithography I using advanced techniques. Making color separations and color proofs. Stripping techniques related to multi-color jobs.
Prerequisites: 1480. Lab fee charged.

1505 The Psychology of the Inner World of the Person **3-0-3**
This course presents psychology as the science of understanding behavior. Topics covered are the following: methods of psychological research, the biological bases of behavior, perception, learning, memory and language, motivation, and emotions.
Prerequisites: None. No lab fee charged.

1506 The Psychology of the External World of the Person **3-0-3**
This course covers the development and growth of people; the personality, the maladjusted patterns of behavior; psychotherapy; social psychology; and applied psychology in terms of business, industry, education, and consumerism.
Prerequisites: 1505 recommended. No lab fee charged.

1512 Microeconomics **3-0-3**
This course introduces the fundamental economic problem of scarcity and provides a brief overview of the macro-system. The primary focus is on demand and supply analysis within individual markets, price determination, analysis of cost, forecasting, and economic decision making in the firm.
Prerequisites: None. No lab fee charged.

1513 Macroeconomics **3-0-3**
This course introduces the basic economic problem of scarcity and provides an overview of the micro-system. The primary focus of the course is on an analysis of price level, inflation and unemployment, the role of government in monetary and fiscal policy, and analysis of aggregate income, consumption, savings and investment.
Prerequisites: None. No lab fee charged.

1521 Introduction to Sociology **3-0-3**
A look at sociology as a science occupied with classifying and defining group behavior. Emphasis is placed on the basic institutions necessary to the processes of socialization and acculturalization.
Prerequisites: None. No lab fee charged.

1531 Introduction to Political Science **3-0-3**
A survey of the nature of political science; its various branches; methods of analysis used; basic characteristics and problems of government and politics; the theories and practices which describe and explain man's behavior in the national and international community.
Prerequisites: None. No lab fee charged.

1532 Introduction to Labor Studies **3-0-3**
An introduction to the field of labor studies, including an introduction to labor history, labor economics, labor law, and the collective bargaining process.
Prerequisites: None. No lab fee charged.

1533 Labor Law **3-0-3**
A study of the major labor legislation in the United States including the National Labor Relations Act, the Taft-Hartley Act and the Landrum-Griffin Act.
Prerequisites: None. No lab fee charged.

1534 Organized Labor in American Politics **3-0-3**
The role of organized labor in American politics, including OCPE, political action committees, the two party system, and Federal Election Commission regulations.
Prerequisites: None. No lab fee charged.

1535 Labor Management Relations **3-0-3**
Origin and development of the labor movement. State and federal labor laws and regulations. Collective bargaining practices and procedures today. Issues and problems in negotiation of contracts.
Prerequisites: None. No lab fee charged.

1536 Practical Government: Dealing with Regulatory Agencies **3-0-3**
Introduces students to the practical workings of typical government agencies that average citizens must deal with during their lives. Agencies to be covered include U.S. Department of Labor, Equal Employment Opportunity Commission, Social Security, and the Veterans' Administration.
Prerequisites: None. No lab fee charged.

1537 Ethics **3-0-3**
Introduces students to some basic ethical principles so that they can apply them to their own academic discipline and career field. Schools of ethics covered are Determinism, Relativism, Hedonism, Self-Realization, Naturalism, Evolutionism, Religious Ethics, and Existentialism.
Prerequisites: None. No lab fee charged.

1599 Special Problems in Social Science **1-5—0—1-5**
Individual study and special projects pertaining to the particular technology that the student is enrolled in. Open to students wishing advanced standing, independent study, and/or research. This course is arranged with the Instructor with the approval of the Dean of the Communication Skills/Social Sciences Division.
Prerequisites: Six hours in Social Sciences. No lab fee charged.

1701 Introduction to Data Processing & Programming **1-9-4**
An overview of the entire field of data processing with an emphasis on programming functions.
Prerequisites: None. No lab fee charged.

1711 Introduction to Data Management & Computer Operations **4-6-6**
An overview of the entire field of data processing with emphasis on the

field of Data Management. Instruction in the operational function of key-operated equipment and introduction to the computer. Laboratory work will reinforce these principles.
Prerequisites: None. No lab fee charged.

1712 Data Entry Systems **2-3-3**
Instruction is given in the operation of card-punch, key-type, and key-disc equipment. Laboratory work will reinforce the instruction.
Prerequisites: None. Lab fee charged.

1721 Programming: Logic & Methods **2-3-3**
The course is designed to give the student initial exposure to programming logic methods, flowcharting, and documentation methodology. It should prepare the student for subsequent programming classes and actual programming problem assignments which might be encountered in the field.
Prerequisites: 1701. Lab fee charged.

1722 Basic & Assembly Programming **2-3-3**
The full range of assembly language instructions and coding techniques are introduced with programs written using auxiliary storage, interrupt processing and table processing. All programs are tested and thoroughly documented. Program linkage and operating systems are introduced.
Prerequisites: 1701, 1721. Lab fee charged.

1731 Peripheral-Equipment Operations **3-7-5**
Instruction is given in the operating procedures of both on-line and off-line equipment. Laboratory work will reinforce the above instruction by providing exposure to normal operator maintenance functions.
Prerequisites: 1711. Lab fee charged.

1739 Operating Systems **2-3-3**
The standard functions of supervisory routines, including introduction to run control, I/O control, multi-programming and service routines, are discussed and explained. Job control languages are introduced with exercises.
Prerequisites: 1701. Lab fee charged.

1740 Operating Systems **4-6-7**
Designed for those students who have elected the Data Management program. Greater emphasis is placed on the functions of an operating system in this program. The student is required to demonstrate advanced techniques in operating a computer under Operating Systems.
Prerequisites: 1711, 1731. Lab fee charged.

1741 Operating Systems II **2-3-3**
Advanced operations concepts, cataloged procedures; generation of test files — OS, MFT, MVT, VSAM; concepts of real-time operating systems and time sharing.
Prerequisites: 1740. Lab fee charged.

1741A Operating Systems **4-6-6**
Designed for those studets who have elected the Data Management program. Greater emphasis is placed on the functions of an operating system in this program. The student is required to demostrate advanced techniques in operating a computer under Operating Systems.
Prerequisites: 1711, 1731. Lab fee charged.

1742 COBOL Programming I **3-7-6**
COBOL programming with emphasis on American National Standard compatibility. The student will write several programs ranging from basic to complex using punched card, magnetic tape, and sequential disc files.
Prerequisites: 1721. Lab fee charged.

1752 Real-Time Systems & Data Communications I **2-3-3**
The System Analysis student will enter into man-machine interactions through a teleprocessing based on data processing system. Topics will include tele-communications hardware and the appropriate (related) programming languages. Emphasis will be placed on the current time-sharing language(s). Also stressed will be problem-solving techniques requiring the use of remote terminals, inquiry-response techniques, and time-sharing techniques.
Prerequisites: 1762. Lab fee charged.

1761 Introduction to RPG II (BDP) **3-7-6**
Beginning level course for the programming major student. Topics include processing of sequential files and generating typical business reports.
Prerequisites: 1701, 1721. Lab fee charged.

1762 COBOL Programming II **4-6-6**
Advanced COBOL techniques using randomly processed disc files. The student is taught to access indexed-sequential and direct-access files using keys and algorithms.
Prerequisites: 1742. Lab fee charged.

1763 Systems Analysis and Design **3-7-5**
A complete methodology of analyzing and designing computer oriented information processing systems is presented. Instruction and exercises cover data collecting, data structure, file structure and design, input editing and volume consideration, processing requirements, output formats, real time and time sharing systems.
Prerequisites: 1701, 1721. No lab fee charged.

1772 Programming Technical Mathematics **3-2-3**
Terminology and basic concepts of automation. Introduction to Fortran programming and its application to the applied sciences. Laboratory experience in writing programs.
Prerequisites: None. Lab fee charged.

1773 Data Preparation and Control **2-1-2**
Instruction is given in the efficient coding and editing of source documents and use of desk controls applied to data processing documents. Input-output control functions are emphasized. Laboratory work will reinforce above instruction.
Prerequisites: 1711. No lab fee charged.

1781 Advanced RPG II **2-3-3**
A business application oriented course for the business data processing student with emphasis on advanced programming techniques using RPG II. Topics include table handling, ISAM and file handling.
Prerequisites: 1701, 1721, 1761. Lab fee charged.

1782 Installation Management **3-0-3**
Instruction in basic management principles leads to detailed analysis of the data processing environment and effective methods of managing it.
Prerequisites: None. No lab fee charged.

1783 Research Project **2-3-3**
Independent research is conducted by each student. The only limitations applied are that the research must be directly related to data processing and must not concern itself directly with any other material covered by the curriculum.
Prerequisites: None. No lab fee charged.

1798 Survey of Data Processing **2-1-2**
Terminology and basic concepts of data processing with emphasis on the application of the electronic computer system.
Prerequisites: None. No lab fee charged.

1799 Survey of Data Processing **4-1-4**
Introduction to the three principal data processing systems; manual, unit record, and electronic computer, with practical applications.
Prerequisites: None. No lab fee charged.

1804 Risk & Insurance **3-0-3**
The concept of risk in the business enterprise, the need for insurance protection against risks in area of property and liability, casualty, fire, life and health. Fundametals of insurance contracts and selection of insurers.
Prerequisites: None. No lab fee charged.

1810 Principles of Salesmanship **3-0-3**
Analysis of the general principles and techniques of effective salesmanship. Principles and problems that include background information a salesman needs, and analysis of the selling process.
Prerequisites: None. No lab fee charged.

1811 Introduction to Salesmanship **4-0-4**
Provides broad preparation in the principles and practices of professional selling. Also helps to round out the education for those students whose major interest is in some other area of marketing.
Prerequisites: None. No lab fee charged.

1812 Salesmanship II **2-0-2**
Study of the selling process. A point by point observation of the steps of a sale and an introduction to industrial and wholesale selling.
Prerequisites: None. No lab fee charged.

1813 Industrial Sales **4-0-4**
Emphasis on salesmanship fundamentals as they apply to industrial

selling. Discuss company, customer and product knowledge; the selling formulas and techniques and building of goodwill; confidence in self, product and company.
Prerequisites: None. No lab fee charged.

1814 Case Studies Industrial Sales **4-1-4**
A course concentrating on the analysis of cases involved in various selling situations. Cases will involve an analysis of sales marketing areas including consumer behavior, product strategy, distribution, promotional and pricing strategy.
Prerequisites: Completion of 1846, 1847, 1813, 1817 or by permission of coordinator. No lab fee charged.

1815 Audiovisual Sales Techniques **3-2-4**
Planning and executing sales presentations using audiovisual media. Emphasis is placed on video camera/playback equipment and other equipment employing sight and sound.
Prerequisites: None. Lab fee charged.

1817 Industrial Purchasing **4-0-4**
Analysis of buyer behavior in terms of the way a company views the market. Review techniques which influence institutional buyers, industrial buyers, the purchasing agent and consumers. Review difference in department buyer and purchasing agent.
Prerequisites: Completion of 1846, 1847, 1813 or by permission of coordinator. No lab fee charged.

1820 Sales Management **4-0-4**
A study of the many and varied duties and responsibilities of the sales manager including selection of sales personnel, leadership, records, and reports, training, motivation, as well as the sales function in the structure of the company.
Prerequisites: None. No lab fee charged.

1823 Business Law I **3-0-3**
Treatment of fundamental principles of business law, including contracts, negotiable instruments, and agencies.
Prerequisites: None. No lab fee charged.

1824 Business Law II **3-0-3**
A continuation of Business Law I with a treatment of government regulations, trust, and insurance.
Prerequisites: 1823. No lab fee charged.

1832 Personnel Management **3-0-3**
A broad overview of the traditional functions of a personnel office, such as job evaluation, recruitment, interviewing, training, employee and union relations, employee services, and of specific concepts concerning human relations and organizational behavior.
Prerequisites: 2926. No lab fee charged.

1836 Principles of Wholesaling **3-0-3**
A comprehensive analysis of the wholesaling function and guidance in the treatment of practical difficulties that arise in the course of applying textbook principles to operational situations.
Prerequisites: None. No lab fee charged.

1840 Retail Merchandising & Operations **4-0-4**
Presents a meaningful and realistic body of information about the complex and dynamic field of merchandising and operations as it pertains to retailing.
Prerequisites: Completion of 1845 or by permission of coordinator. No lab fee charged.

1842 Advertising and Display **3-2-4**
Advertising media and their effects upon business. Practical applications of display theories as they relate to window and internal displays. Display and its relation to interior decorating and design.
Prerequisites: None. Lab fee charged.

1845 Principles of Retailing **3-0-3**
Introduces students to the field of retailing and provides the technical and theoretical knowledge necessary for retail mid-management employment. Case studies are introduced to give the students practical operating experiences.
Prerequisites: None. No lab fee charged.

1846 Industrial Product Marketing I **4-0-4**
Study of the nature and characteristics of industrial markets, procedures involved in industrial purchases and sales, psychology in industrial buying, distribution channels, and service policies and operating plans.
Prerequisites: None. No lab fee charged.

1847 Industrial Product Marketing II **4-0-4**
Techniques for pricing industrial products and services; product line planning; product policy, short-range and long-range planning, market research and development.
Prerequisites: Completion of 1846 or by permission of coordinator. No lab fee charged.

1850 Computerized Business Applications **2-3-3**
The computer as a management tool. Accounts Receivable, Accounts Payable, Inventory Control, Payroll, Accounting Statements, and other business application models are studied using the medium-sized computer. Other topics include Hardware and Data Controls.
Prerequisites: 2912. Lab fee charged.

1851 Auditing **4-1-4**
Auditing techniques and procedures for computer based accounting. Topics include review of internal control; preparation of audit programs, flowcharts and working papers; internal auditing. Students will utilize the computer and peripheral equipment in course.
Prerequisites: 1850 or 1798, 1799 or comparable course, 2913. No lab fee charged.

1852 EDP & Auditing **2-3-3**
A study of methods of accounting control and the application of computerized audit techniques. The person taking this course is one of two types: (1) a practicing auditor or manager with a limited background in computers; or (2) a student usually of 4th or 5th term standing.
Prerequisites: 1851. Lab fee charged.

1999 Special Problem Seminar **Var-Var-Var**
Individual study and special projects pertaining to the particular technology that the student is enrolled in. Open to fourth and fifth term students, by special arrangement with the Coordinator and Division Dean.
Prerequisites: None. No lab fee charged.

2000 Industrial Hygiene Recognition **3-0-3**
Recognition of environmental factors and stresses which influence health.
Prerequisites: None. No lab fee charged.

2010 Industrial Hygiene Measurements **2-3-3**
Gas and vapor volume calculations and sampling, sampling for particulars, air flow measurements and quality standards, toxic concentrations. To include: area ventilation heat stress, noise characteristics, electromagnetic energy measurements and illumination.
Prerequisites: 2009. Lab fee charged.

2011 Industrial Hygiene Control **3-1-3**
General methods of controlling environmental factors and stresses which influence health.
Prerequisites: None. No lab fee charged.

2199 Special Problems Seminar **Var-Var-Var**
Individual and independent study and special projects pertaining to the particular technology in which the student is enrolled. Open to fourth and fifth term students, by special arrangement with the Coordinator and Division Dean.
Prerequisites: None. No lab fee charged.

2200 Basic Chemistry **2-3-3**
An introductory course for the student who did not have high school chemistry or whose background in chemistry is weak. Topics covered include properties, structure and chemical classification of matter, use of symbols, formulas and equations, chemical bonding, properties of bases, salts and solutions, naming of acids, bases and salts, radioactivity, and organic chemistry. (All students will be tested for basic math competency and if there is a need, will be referred to the appropriate math course.)
Prerequisites or Corequisites: 1150 or 1170 or equivalent. Lab fee charged.

2209 Technical Chemistry Survey **3-2-4**
Substances, pure and impure; chemical bonding; crystals; chemical reactions; acids and bases; oxidation and reduction; polymer formation.
Prerequisites: None. Lab fee charged.

2210 Inorganic Chemistry **3-2-4**
This is a short course in the theory of inorganic chemistry integrated with related laboratory techniques for the laboratory technician. Eye goggles required, laboratory apron or laboratory coat suggested.
Prerequisites: 1150 or 1170 or equivalent. Lab fee charged.

2221 Technical Physics I **3-2-3**
Fundamental principles of heat and electricity treated with emphasis on heat, electronic theory, circuits and instruments with special application to everyday devices such as the motor vehicle. Students enrolled in this course should expect to spend at least two hours per week gaining actual hands-on laboratory experience.
Prerequisites: None. Lab fee charged.

2222 Technical Physics II **3-2-3**
Fundamental principles of mechanics, treated with emphasis on the kinematics and dynamics of machines and fluids with special application to everyday devices such as the motor vehicle. Students enrolled in this course should expect to spend at least two hours per week gaining hands-on laboratory experience.
Prerequisites: None. Lab fee charged.

2231 Fundamentals of Inorganic Chemistry **3-2-4**
The first course of a three-course sequence aimed at increasing the background knowledge of chemistry for those interested in licensure in the allied health field. The structure and properties of matter, changes in matter, chemical bonding, chemical reactions, equilibrium.
Prerequisites: 1151 or equivalent. Lab fee charged.

2232 Fundamentals of Organic Chemistry **3-2-4**
The second course of a three-course sequence aimed at increasing the background knowledge of chemistry for those interested in licensure in the allied health field. Organic chemistry as related to the study of biochemistry - carbon bonding; saturated, unsaturated and aromatic hydrocarbons; alcohols, phenols, aldehydes, ketones, acids, amines.
Prerequisites or Corequisites: 2231 or equivalent. Lab fee charged.

2233 Fundamentals of Biochemistry **3-2-4**
The third course of a three-course sequence aimed at increasing the background knowledge of chemistry for those interested in licensure in the allied health field. Biochemistry - carbohydrates, amino acids, proteins, lipids, vitamins, enzymes, metabolism, body fluids.
Prerequisites: 2232 or equivalent. Lab fee charged.

2244 Health Physics **3-2-3**
Pressure and other related topics as applied to the Allied Health profession; Forces and addition of vector quantities pertaining to biological systems; Properties of waves, including frequency, wavelength, speed, amplitude, reflection, and refraction; Optical instruments, including basic principles of geometric optics; Atomic spectra and spectroscopic techniques; Electromagnetic radiation, including basic sources and detection schemes of IR, UV, visible, X-Ray, and gamma radiation; Fundamental nuclear particles and applications of nuclear techniques both as diagnostic and therapeutic tools; Fundamentals of basic electricity, including current, resistance, simple DC circuits, potentiometer, transformer, and simple amplifier circuits; simple schematics, and basic components of various medical instruments.
Prerequisites: 1151. Lab fee charged.

2245 Health Physics II **3-2-3**
Electromagnetic radiation, including basic sources detection schemes and medical application of infra-red, visible, ultra-violet, X-ray, and gamma radiation; fundamental nuclear particles and applications of nuclear techniques both as diagnostic and therapeutic tools; the electron, fundamental forces with emphasis on the electric field, potential energy and voltage, current, resistance and simple DC circuits; the potentiometer, the transformer; schematics and simple circuit layout; basic components of various medical instruments.
Prerequisites: None. Lab fee charged.

2261 Printing Science I (Chemistry) **3-2-3**
Concepts of chemistry related to production procedures, converting raw materials to finished product in the graphic communication field. Students enrolled in this course should expect to spend at least two hours per week gaining actual hands-on laboratory experience.
Prerequisites: None. Lab fee charged.

2262 Printing Science II (Physics) **3-2-3**
Fundamental principles of mechanics, heat, color and electricity with special applications to the field of graphic communications. Students enrolled in this course should expect to spend at least 2 hours per week gaining actual hands-on laboratory experience.
Prerequisites: None. Lab fee charged.

2270 Introductory Laboratory Science **3-2-3**
Fundamentals of Physics; laboratory procedures; the controlled experiment; methods of measurement; techniques of data collection and analysis; interpretation of experimental results.
Prerequisites: 1170 or 1150. Lab fee charged.

2291 Physics I - Kinematics and Dynamics **3-2-3**
Measurement techniques; functions and scaling; kinematics; velocity vectors; motion near the earth; laws of force and motion; work; energy; power; impulse; momentum; machines; conservation of energy and momentum.
Corequisites: 1172 or 1191. Lab fee charged.

2292 Physics II - Mechanics and Heat **3-2-3**
Translational equilibrium; center of gravity; moments of forces; force analysis of structures; beams; trusses; booms; shear; elasticity; friction as a force; structure of matter; density; pressure; temperature scales; expansion; molecular energy; specific heat; change of state; heat of combustion; heat energy.
Prerequisites: 2291, 1191 or 1172. Lab fee charged.

2293 Physics III - Electromagnetic Waves **3-2-3**
Electromagnetic Radiation with emphasis on the Wave Nature; Basic Wave properties; The Electromagnetic Spectrum with emphasis on the Visible Region, Refraction, Fundamentals of Geometric Optics, Simple Optical Instruments; Diffraction; Spectral Analysis and Color; Vision, and the Eye; The Inverse Square Law and the Nature of the Fundamental Forces.
Prerequisites: 2291, 1191 or 1172. Lab fee charged.

2294 Physics IV - Atomic and Nuclear **3-2-3**
Relativity, and the relativistic changes in space, time, and mass; Mechanics of the Electron and its relationship to the field of Electronics; Electron Energies, and their relationship to Electromagnetic Radiation; Planck's Radiation, the Hydrogen Atom; the Compton Effect, Photoelectric Effect, and other related Atomic Phenomena. The Nucleus and its Structure, Mass Defect, and Binding Energy; Radioactivity and Modes of Decay; Half-Life, and Carbon 14 Dating, Fission, Fusion, Reactors and Power Generation; The Biological Effects of Nuclear Radiation.
Prerequisites: 2291, 1192. Lab fee charged.

2501 Automotive Technology I **5-10-8**
Principles of the internal combustion engine. Repair and rebuilding modern automotive engines, including valves, rings, bearings, cooling and lubrication systems. Emphasis on the proper use of hand tools and special equipment.
Prerequisites: None. No lab fee charged.

2502 Automotive Technology II **5-10-8**
Principles of carburetion; cleaning, rebuilding and adjusting representative types of carburetors and other fuel components. Fundamentals of auto electrics; construction, operation and repair of the electrical system, including batteries, ignition, starting, generating and accessory circuits.
Prerequisites: None. No lab fee charged.

2503 Automotive Technology III **2-8-4**
Fundamentals and repair of the automobile chassis; includes suspension, braking system, steering and ventilation systems. Emphasis on the use of special equipment used to measure, repair and adjust these units.
Prerequisites: None. No lab fee charged.

2504 Automotive Technology IV **2-8-4**
A study of the design, construction, operation and servicing of automotive drive line components. These components include clutches, transmissions, rear axles and differentials.
Prerequisites: None. No lab fee charged.

2505 Automotive Technology V **5-10-8**
Automotive service and trouble-shooting. Procedures and techniques for diagnosing and repairing electrical, engine and carburetion problems. The latest types of automotive testing equipment are studied together with standard repair procedures as practiced in the modern automotive shop. Work will be performed on live equipment.
Prerequisites: None. No lab fee charged.

2506 Machine & Hand Tool Laboratory **1-4-3**
Principles and processes which underlie the use of hand tools, cutting tools, portable equipment and accessories, measuring devices and guages. Emphasis is placed on developing sound trade judgement, safe work habits and correct work procedures.
Prerequisites: None. Lab fee charged.

2507 Basic Blueprint Reading & Sketching **2-2-3**
Provides a working knowledge of blueprint reading and shop sketching with special application and emphasis for different technologies. Technical terminology is defined and applied in a logical sequence for each new principle.
Prerequisites: None. Lab fee charged.

2508 Techniques of Welding **1-4-2**
Fundamental understanding and skill in the use of oxyacetylene, arc welding and cutting equipment is developed. Such typical operations as butt, lap and fillet welds and the making of a bead are performed.
Prerequisites: None. Lab fee charged.

2510 Automotive Management I **2-3-3**
Organization, design, lay-out, administration and operation of an automobile dealership, trucking company or automotive leasing operation. Recruiting, hiring and retaining personnel.
Prerequisites: None. No lab fee charged.

2511 Automotive Management II **2-3-3**
A continuation of Automotive Management I. Engineering traffic flow, building parts and accessory sales, customer relations, measuring local parts and accessory market. Service selling and automotive warranties.
Prerequisites: None. No lab fee charged.

2801 Introduction to Restaurant Management **2-4-3**
History, objectives, economics, scope and social importance of the industry. Emphasis on sanitation and safety techniques in the kitchen with lab experience. Students in the Chef Apprenticeship Program may elect to take OJT in lieu of lab.
Prerequisites: None. Lab fee charged.

2802 Restaurant Management II **2-4-3**
Factors determining food choices, food nutrition needed in each stage of life. Nutritive value of food selection to meet economic, nutritive and social needs. In addition, complete kitchen layout and design including lab experience. Students in the Chef Apprenticeship Program may elect to take OJT in lieu of lab.
Prerequisites: 2801. Lab fee charged.

2803 Restaurant Management III **2-4-3**
Detailed menu planning, design and development with emphasis on costing and pricing including lab experience. Students in the Chef Apprenticeship program may elect to take OJT in lieu of lab.
Prerequisites: 2801. Lab fee charged.

2804 Restaurant Management IV **3-0-3**
First-line supervisor: selection and training qualified personnel for management positions in a restaurant including lab experience. Students in the Chef Apprenticeship program may elect to take OJT in lieu of lab.
Prerequisites: 2801. No lab fee charged.

2805 Restaurant Management V **3-0-3**
Guidance and development of employees including discipline, handling complaints and grievances, job satisfaction and morale, and lab experience. Students in the Chef Apprenticeship program may elect to take OJT in lieu of lab.
Prerequisites: 2801. No lab fee charged.

2806 Beverage Management **2-1-2**
Studies of actual situations, pricing and profit, beverage personnel job descriptions, terms, merchandising, liquor laws in relation to hospitality refreshments.
Prerequisites: None. No lab fee charged.

2811 Introduction to Hotel-Motel Management **3-0-3**
A study of the various departments within the framework of private clubs, hotels, and motels, available vocational opportunities, and a look at the future.
Prerequisites: None. No lab fee charged.

2812 Hotel-Motel Management II **3-0-3**
Study of front office management and operation with emphasis on the use of various front office equipment, supplies, and procedures, including registration, rates, hotel racks, charge and credit.
Prerequisites: None. No lab fee charged.

2813 Hotel-Motel Management III **3-0-3**
Studies in housekeeping and its administration, control of supplies, sanitation, cleaning techniques, decoration, equipment and related subjects.
Prerequisites: None. No lab fee charged.

2814 Hotel-Motel Management IV **3-0-3**
A study of sanitation, safety, and maintenance of hotel operations, including landscaping, swimming pool maintenance, sewage disposal, laundry, water treatment, and management functions of chief engineer.
Prerequisites: None. No lab fee charged.

2815 Hotel-Motel Management V **3-0-3**
A study of the nature of management: planning, organizing, controlling, standards and appraising, communications, motivations, and decision making in the hotel industry.
Prerequisites: None. No lab fee charged.

2821 Sales Techniques **2-0-2**
Establishing a sales department and sales personnel for the hotel-motel-restaurant industry, their purposes and goals. An analysis of your prospects, competition, your company or organization and yourself.
Prerequisites: None. No lab fee charged.

2822 Fundamentals of Food Preparation I **2-4-3**
Through lecture and laboratory work this course provides breakfast food preparation (eggs, fritters, omelettes, pancakes, etc.), good practices in personal cleanliness and safety and sanitary food handling, and food cost calculation. Chef Apprenticeship students may elect to take OJT in lieu of lab.
Prerequisites: None. Lab fee charged.

2823 Food Preparation II **2-4-3**
Through lecture and laboratory work this course provides for fundamental food preparation and the development of cooking techniques, emphasizing breakfast foods and baking techniques; an awareness of control and cost of supplies and menu planning. Chef Apprenticeship students may elect to take OJT in lieu of lab.
Prerequisites: None. Lab fee charged.

2824 Food Preparation III **2-4-3**
This course provides through lecture and laboratory work for the development of cooking techniques - meat preparation (roasting, broiling, butchering), cake decorating and pastry; students acquire knowledge about food production systems - planning and writing menus; and the prevention of food spoilage and contamination. Students in the Chef Apprenticeship program may elect to take OJT in lieu of lab.
Prerequisites: None. Lab fee charged.

2825 Food Preparation IV **2-6-3**
This course emphasizes through lecture and laboratory work quality food preparation of salads, soups, vegetables, cold meats and fried foods; ice carving; and development of relationships between time, labor, equipment and food costs. Students in the Chef Apprenticeship program may elect to take OJT in lieu of lab.
Prerequisites: None. Lab fee charged.

2826 Food Preparation V **2-6-3**
Through lecture and laboratory work students learn food preparation - with emphasis on broiling, stewing, braising and sauteeing; managerial duties and responsibilities in controlling food quality and costs are stressed. Chef Apprenticeship students may elect to take OJT in lieu of lab.
Prerequisites: None. Lab fee charged.

2901 Principles of Marketing I **3-0-3**
Details the principles and functions of marketing. The essential concepts of competition, demand, and the structure of distribution. The roles of marketing management and the marketing executive are emphasized.
Prerequisites: None. No lab fee charged.

2902 Principles of Marketing II **3-0-3**
The analysis, interpretation, application, and forecasting of research findings in marketing management. The case study method is used in relating these techniques to actual marketing problems.
Prerequisites: 2901 or permission of coordinator. No lab fee charged.

2904 Office Management **3-0-3**
Administrative management and organization of office departments; methods used in selection and training of office personnel, office planning and layout, cost controls, types and uses of office appliances, office forms, and an analysis of office procedures.
Prerequisites: 1832. No lab fee charged.

2905 Money & Banking **3-0-3**
The processes of modern banking, including capital, deposits, loans, investments, and reserves. Credit expansion and contraction. The operation of the Federal Reserve Systems.
Prerequisites: None. No lab fee charged.

2906 Credits & Collections **3-0-3**
Sources of credit information, understanding credit and alternatives to successful collections including procedures of small claims courts, bankruptcy and court settlements. Study of types of credit, analyzing credit and computation of the dollar cost of credit, aging accounts receivable, telephone collections, collection letters and personal contact collections, including repossession procedures.
Prerequisites: 2960. No lab fee charged.

2907 Introduction to Marketing **4-0-4**
For students who take only a first course and for those who elect to major in the discipline. Teaches the fundamentals of marketing in an interesting, challenging, and rewarding way. Focuses on key concepts of marketing.
Prerequisites: None. No lab fee charged.

2908 Case Studies in Marketing **4-1-4**
Case studies of companies - some strategies that failed along with those that succeeded. Teaches students to make decisions based on facts given to achieve company goals.
Prerequisites: Completion of 2907 or by permission of coordinator. No lab fee charged.

2909 Office Accounting I **2-3-3**
Principles and practices of basic accounting for the student who is required to complete only one term of accounting or needs 2910. Includes recording, and accumulating financial events, preparation of statements, adjustments and cash and banking procedures. Limited to a study of service enterprises.
Prerequisites: None. No lab fee charged.

2910 Office Accounting II **2-3-3**
A continuation of the concepts developed in 2909. Topics include account receivables, account payables, comprehensive practice set.
Prerequisites: 2909. No lab fee charged.

2911 Principles of Accounting I **3-2-3**
Principles and practices of basic accounting, including journalizing, posting, adjusting accounts, preparing financial statements, cash and banking procedures, and a study of the uses of special journals with practical applications as they relate to each program.
Prerequisites: None. No lab fee charged.

2912 Principles of Accounting II **3-2-3**
A continuation of Principles of Accounting I. The uses of subsidiary ledgers, classified financial statements, and payroll accounting and associated payroll tax returns are studied. Practical accounting problems as they relate to everyday business are discussed as part of daily class routines.
Prerequisites: 2911. No lab fee charged.

2913 Principles of Accounting III **3-2-3**
The more advanced aspects of accounting principles are reviewed. Topics include: partnership, corporations, earnings per share, retained earnings, dividends, bonds and investments, working capital, financial position, and analysis of financial statements.
Prerequisites: 2912. No lab fee charged.

2914 Cost Accounting I
Nature and purpose of cost accounting. Accounting and control procedures for materials, labor and manufacturing overhead. Cost effects of fixed and variable costs. Predetermining departmental overhead rates.
Prerequisites: 2913. No lab fee charged.

2915 Cost Accounting II **3-2-3**
Job order cost system and process cost system, standard cost accounting. Setting cost standards, variance analysis. Direct costing, accounting for scrap and spoilage. Managerial use of cost data.
Prerequisites: 2914. No lab fee charged.

2917 Federal Taxation I **2-3-3**
A study of Federal Income Tax as it relates to the individual taxpayer. The course deals in general terms with the most common aspects of taxes as they relate to the individual and business.
Prerequisites: None. No lab fee charged.

2918 Federal Taxation II **2-3-3**
A study of Federal Taxation dealing with advanced topics, partnerships and corporations.
Prerequisites: 2917. No lab fee charged.

2919 Intermediate Accounting I **2-3-3**
Preparation and analysis of accounting statements; special problems in accounting for current, plant, investment, and intangible assets, for liabilities and for corporate net worth; and funds and reserves.
Prerequisites: None. No lab fee charged.

2920 Intermediate Accounting II **2-3-3**
Advanced topics in accounting theory and practice dealing with corporations. Topics include retained earnings, earnings per share, accounting changes, changes in financial position and financial statement analysis.
Prerequisites: 2919. No lab fee charged.

2921 Managerial Accounting **2-3-3**
Determining cost and revenue relationships for management, managerial uses of quantitative techniques and financial statement analysis in managerial decision making.
Prerequisites: 2913. No lab fee charged.

2925 Business Principles **3-0-3**
A study of the nature of business, forms of business ownership, production problems and financing, forecasting, budgeting, governmental regulations of business, business personnel practices, the security markets and financial news.
Prerequisites: None. No lab fee charged.

2926 Principles of Management **3-0-3**
Meaning, scope, and place of management functions; study of formal and informal organizational structures including line and staff relationships indicating authority and responsibility. Introduction to organization for management in government, business, institutions.
Prerequisites: None. No lab fee charged.

2927 Security Management **3-0-3**
The emerging role of security management in the modern organization. Organization of the internal structure of the security department and the roles and responsibilities of director, supervisors, and individual employees. Planning, budgeting, inspections, evaluation of countermeasures, investigations, office administration, and public relations.
Prerequisites: None. No lab fee charged.

2928 Hotel-Motel Accounting **3-0-3**
Capital expenditures for fixed assets of a hotel or motel, prepayments and deferrals of income and expense, analysis of accounts receivables and uncollectibles, break-even analysis related to room occupancy, purpose of the night audit, and the uniform account classification prevailing in the hotel-motel industry.
Prerequisites: None. No lab fee charged.

2929 Audit Procedures and Operations **3-0-3**
Practical operating procedures of the NCR 4200 in performing night audit. Operation of posting machines and peripheral office equipment.
Prerequisites: None. No lab fee charged.

2930 Hotel-Motel Case Studies **3-0-3**
Case studies involving the hotel industry which include daily operations, reports, analysis of income statements, and audit of cashier reports.
Prerequisites: 2928. No lab fee charged.

2931 On-Site Property Management I **3-1-3**
Practical methods for successful management of property at the on-site level. This course encompasses management systems and philosophies, property administration, merchandising and renting, formal

and informal communications, legal ramifications of managing apartments.
Prerequisites: None. No lab fee charged.

2932 On-Site Property Management II **3-1-3**
Continuation of course 2931, practical methods for successful management of property at the on-site level. Encompasses interior, exterior, mechanical and grounds maintenance, budgeting, accounting, financial reports, insurance, purchasing and resident coordination.
Prerequisites: 2931. No lab fee charged.

2933 Executive Level Property Management I **3-1-3**
Techniques for successful management of property at the executive level. This course encompasses investment objectives, use of data and statistics, analysis of regions, neighborhoods and markets, financial analysis and methods, budgeting, cash flow projection, economics of alternatives, developing and managing apartments, offices, shopping centers, condominiums and cooperatives, and developing the management plan.
Prerequisites: None. No lab fee charged.

2934 Executive Level Property Management II **3-1-3**
This course is a continuation of course 2933, techniques for successful management of property at the executive level. It encompasses the objectives of ownership, forms of ownership, real estate finance methods, valuation of property, present value theory, depreciation and tax considerations, cash flow projections and the management plan.
Prerequisites: 2933. No lab fee charged.

2935 Property Management Case Study **3-0-3**
A case study utilizing a property in the Cincinnati area on which the student will develop a complete management plan. The student is allowed to utilize in a real management situation all the techniques and skills of property mangement developed in courses 2931, 2932, 2933, and 2934, and to apply them in the form of a management plan created by the student for a specific property.
Prerequisites: 2933 and 2934. No lab fee charged.

2940 Real Estate Sales **3-0-3**
Listing real estate. The exclusive listing. Listing goals and aids. Classified advertising, Qualifying buyers. Financing showing the property The purchase contract. Obtaining and presenting the offer. Creative salesmanship.
Prerequisites: 2951. No lab fee charged.

2945 Residential Construction **3-0-3**
This course is a "bricks and mortar" course for the non-constructionist. Topics covered will include site work and concrete; building structure to the roof; finishing trades and scheduling; cost estimating; and the lender and the appraiser.
Prerequisites: None. No lab fee charged.

2951 Real Estate Principles & Practices **3-0-3**
An introduction to real estate economics; principles of contracts, financing, brokerage, appraisal. This course is required by the state of Ohio prior to taking the sales license exam.
Prerequisites: None. No lab fee charged.

2952 Real Estate Brokerage **3-0-3**
Introduction to the operation of a real estate brokerage: office management; selecting, training, and retaining sales personnel; marketing and advertising; and expansion.
Prerequisites: 2951, 2953. No lab fee charged.

2953 Real Estate Law **3-0-3**
Law of agency as applied to real estate, law of fixtures, estates including leases. Conveyancing of real estate, the sales contract, the mortgage, deeds and recording. Real estate brokers and managers, license laws of Ohio. Zoning, cooperatives, and condominiums. This course is required by the state of Ohio prior to taking the sales license exam.
Prerequisites: None. No lab fee charged.

2954 Real Estate Finance **3-0-3**
A study of financing real estate including major instruments, mortgage market, financial institutions, government influence, evaluation and risk in lending, and amortization and present value of future income streams. Required by state of Ohio prior to taking brokers license exam.
Prerequisites: 2951, 2953. No lab fee charged.

2955 Real Estate Appraisal I — Residential **3-0-3**
Methodology of appraising: residential property. Theory of appraisal techniques. The three basic approaches of appraising: market comparison, cost of replacement, and income capitalization. Required by state of Ohio prior to taking the broker's license exam.
Prerequisites: None. No lab fee charged.

2956 Real Estate Appraisal II — Income-Producing Properties **3-0-3**
Comprehensive analysis of theory and practical application of preparing an appraisal on investment property. Appraisal techniques unique in the area of income-producing properties. A term case study project is assigned providing practical experience in utilizing the income approach.
Prerequisites: 2955. No lab fee charged.

2957 Real Estate Seminar: Special Topics **3-0-3**
Issues and problems facing the real estate industry. Case studies discussed.
Prerequisites: 2951, 2953. No lab fee charged.

2960 Principles of Finance **3-0-3**
Study of consumer finance, small business and large business finance, including scheduling, transporting and flow of goods.
Prerequisites: 2905. No lab fee charged.

3001 Typewriting I **2-3-3**
A beginning course in typewriting including keyboard mastery, machine parts, introduction to the business letter, and simple tabulation exercises.
Prerequisites: None. Lab fee charged.

3002 Typewriting II **2-3-3**
Brief review of keyboard and techniques; intensified drills on improvement of speed and accuracy; progress through business letters, forms, and tabulation.
Prerequisites: Minimum grade of "C" in Typewriting I or permission from coordinator. Lab fee charged.

3003 Typewriting III **2-3-3**
The development of skills, knowledge, and techniques applicable to typewriting. Opportunity is provided for the student to experience situations in which problem solving is necessary, advanced typing problems and techniques. Knowledge and skills involved in production typewriting.
Prerequisites: Minimum grade of "C" in Typewriting II or permission from coordinator. Lab fee charged.

3004 Typewriting IV **2-3-3**
Application of the basic processes of typewriting. The adaptation of job-analysis data to letter writing, manuscripts, forms, duplication, statistical tabulation, reports, legal documents, and rought draft material.
Prerequisites: Minimum grade of "C" in Typewriting III or permission from coordinator. Lab fee charged.

3005 Administrative Typewriting **2-3-3**
An introduction to touch typewriting with problem-solving emphasis on business correspondence, tabulation, telegrams, duplicating masters, and the special typing assignments encountered in administrative positions.
Prerequisites: None. Lab fee charged.

3010 Shorthand I — Gregg **4-1-4**
Designed for those students who have had no previous shorthand training. Gregg Shorthand with emphasis on rapid reading of plate material and mastery of principles of theory including brief forms. An introduction to writing shorthand and transcribing on the typewriter from shorthand notes.
Prerequisites: None. No lab fee charged.

3011 Shorthand I — Century 21 **4-1-4**
Designed for those students who have had no previous shorthand training. Century 21 Shorthand, with emphasis on rapid reading of plate material and mastery of principles of theory including speed forms. An introduction to writing shorthand and transcribing on the typewriter from shorthand notes.
Prerequisites: None. No lab fee charged.

3012 Shorthand II — Century 21 **4-1-4**
A continuation of Shorthand I, Century 21 and/or designed for those students who have had previous shorthand training who can pass a two-minute, 60 words per minute take. A continuation of principles from 3011 and an introduction to dictation from unfamiliar material. Emphasis is on speed development.
Prerequisites: Minimum grade of "C" in 3011 or by permission of the coordinator. Lab fee charged.

3013 Shorthand III — Gregg & C 21 **4-1-4**
An advanced course designed for those students who have had previous Gregg or Century 21 shorthand training. Emphasis is on speed development from both familiar and unfamiliar material.
Prerequisites: Minimum grade of "C" in 3012 or 3020 or permission of the coordinator. Lab fee charged.

3014 Transcription I — Gregg & C 21 **2-8-4**
A continuation of the study of Gregg and Century 21 shorthand fundamentals and a development of transcription skill. Emphasis is on the development of mailable transcription, with a review of punctuation and spelling.
Prerequisites: Minimum grade of "C" in 3013 or 3029 or by permission of coordinator. Lab fee charged.

3015 Transcription II — Gregg & C 21 **2-8-4**
Continuation of 3014. Emphasis is on mailable transcription. Integration of office-style dictation and the mailable letter to meet office standards.
Prerequisites: Minimum grade of "C" in 3014 or permission of the coordinator. Lab fee charged.

3016 Legal Terms & Transcription I — Gregg & C 21 **2-8-4**
Stress is on development of legal vocabulary and transcription of legal shorthand dictation. Latin and French root words are studied as legal shorthand vocabulary is increased. Polishing of techniques regarding preparation of legal instruments and documents.
Prerequisites: Minimum grade of "C" in 3013 or 3029 or permission of coordinator. Lab fee charged.

3017 Legal Terms & Transcription II — Gregg & C 21 **2-8-4**
Continuation of 3016.
Prerequisites: 3016 with grade of "C" or better or permission of coordinator. Lab fee charged.

3020 Shorthand II — Gregg **4-1-4**
A continuation of Shorthand I - Gregg - and/or designed for those students who have had previous shorthand training who can pass a two-minute, 60 words per minute take. A continuation of principles from 3010 and an introduction to dictation from unfamiliar material. Emphasis is on speed development.
Prerequisites: Minimum grade of "C" in 3010 or by permission of coordinator. Lab fee charged.

3021 Office Procedures **3-0-3**
An introduction to the training and development of personality qualities essential to the office worker and the development of principles and procedures fundamental to basic office duties and activities.
Prerequisites: None. No lab fee charged.

3022 Office Machines **2-3-3**
A general survey of the techniques, processes, operations and applications of business and office machines. Machines included are memory, MTST, composer, printing and electronic calculators, mimeographine and spirit duplicator.
Prerequisites: 3001. Lab fee charged.

3023 Machine Transcription **3-0-3**
A survey course to introduce the student to transcribing machines and to the techniques of machine transcription.
Prerequisites: 3001. No lab fee charged.

3024 Secretarial Procedures **3-0-3**
Business information applicable to office employment. Emphasis on important responsibilities of the office worker pertaining to business communications, travel, meetings, reference and preparation of reports.
Prerequisites: None. No lab fee charged.

3025 Legal Secretarial Procedures I **2-3-3**
Among topics to be studied are legal correspondence and filing, judicial procedures, law books and other reference materials, introductory research techniques, probate procedures, civil suits, public relations, and seeking, keeping or changing jobs.
Prerequisites: Shorthand III or IV with a grade of "C" or better, 1823. Lab fee charged.

3027 Office Practicum **2-3-3**
Designed for the student who has elected to follow the General Secretarial Curriculum. Each student's program is to be individually designed to further develop the necessary skills required to secure a position in his or her chosen field, including basic office routines, human relations, and individual responsibilities.
Prerequisites: None. No lab fee charged.

3028 Secretarial Practicum **3-7-5**
An intensive course in secretarial practicum emphasizing the area of business that is of particular interest to the student. Each student's program is to be individually designed to provide an opportunity to strengthen those areas where he or she may need additional training as well as to provide realistic practice in his or her chosen field, including decision-making responsibility, creative work, and human relations.
Prerequisites: 3027. No lab fee charged.

3029 Shorthand IV — Gregg & C 21 **4-1-4**
Designed for those students who enter the program with advanced standing and who are placed in advanced shorthand. Emphasis is on speed development from both familiar and unfamiliar material and development of mailable transcription.
Prerequisites: Minimum grade of "C" in 3013 or by permission of coordinator. No lab fee charged.

3032 Records Management **3-0-3**
A foundation in the methods and systems of storing and retrieving information. The course includes the principles governing what records to keep, how to store them, and how to apply the criteria for determining the disposition and retention of records.
Prerequisites: None. No lab fee charged.

3045 Legal Research Projects I **2-8-4**
Individualized projects to equip the student with the techniques for law search and research.
Prerequisites: Business Law I and permission of the legal secretarial coordinator. No lab fee charged.

3050 Introduction to Word Processing **4-4-6**
A comprehensive "hands on" application of the basic operation and management of Word Processing and the Text Management System. The course will introduce students to a set of computer assisted instruction lessons especially designed to acquaint students with the Advance d Text Management System display terminal. Course will also include exercises to enhance the training.
Prerequisites: 3001. No lab fee charged.

3051 Introduction to Word Processing II **4-4-6**
A continuation of the overview of Word Processing and the completion of the "Learn" Lessons to prepare students for entry into Text Management and Editing. Students will perform such functions as entering unformatted text, replacing, restructuring and storage of documents and subdocuments. Completion of the "Learn" Lessons will reinforce the successful operation of the Advanced Text Management System display terminal.
Prerequisites: 3050. No lab fee charged.

3052 Text Management **4-4-6**
An introduction to the Advanced Text Management System-III (AMTS). Students will become acquainted with formatted text, text formatting controls, text line controls, modification, deletion and insertion techniques of documents and subdocuments. Students will also review basic grammar, punctuation and spelling check for successful entry of documents.
Prerequisites: 3051. No lab fee charged.

3053 Transcription & Text Editing I **4-4-6**
Entry and editing of formatted and unformatted text, footing, centering, and headings. Columnar entry and editing and tabulated materials will be programmed. Insertions, deletions and modifications of text are drilled to acquaint students with features in a business-like setting. Reports and tables will be constructed via the use of line commands and controls.
Prerequisites: 3052. No lab fee charged.

3054 Transcription & Text Editing II **4-4-6**
An introduction to the role of text administrator. Students will become acquainted with Generalized Markup Language, asynchronous and synchronous queues, archiving in and out via a computer, document handling controls, line commands, and status-oriented command and controls, and the formatting of projects. A case study will be given each student to familiarize them with the business world and any special application of the ATMS-III Word Processing System.
Prerequisites: 3053. No lab fee charged.

3055 Medical Office Transcription **1-3-2**
A survey course to introduce the student to transcribing machines and the techniques of transcription. Medical terminology related to the transcription of history and physical reports, pathology reports, surgical reports, radiologic reports, laboratory reports, operative reports, reports of diagnostic tests, letters and other correspondence. Students should attain proficiency in producing mailable transcripts using correct punctuation, spelling, and format.
Prerequisites: Typing II. Lab fee charged.

3094 Workshops in Business **Var-0-Var**
Consideration and study of selected issues and topics in the business technologies area designed to meet current needs. Content and emphasis varies from year to year.
Prerequisites: None. Lab fee charged.

3500 Orientation to Horticulture Occupations **1-1-1**
Introduction to the needs of the industry. Types of jobs available, salary ranges, and working conditions. Field trips.
Prerequisites: None. No lab fee charged.

3501 Soils and Plant Nutrition **3-0-3**
A basic course dealing with the formation and physical, chemical and biological properties which affect plant growth.
Prerequisites: 2209. No lab fee charged.

3502 Horticulture Science I **3-1-3**
To provide an elementary understanding of the fundamentals of plant growth, anatomy, taxonomy, reproduction and genetics.
Prerequisites: None. No lab fee charged.

3504 Woody Plant Materials I **2-3-3**
An introductory study of woody plants grown in nurseries for landscape purposes and, secondarily, of those found in arboretums, woodlands, and fields within the state and adjacent states. Emphasis is on deciduous shrubs and small trees, their identification, culture, uses, flowers and fruits, and ecological relationships. One all-day field trip required.
Prerequisites: None. No lab fee charged.

3505 Herbaceous Plant Materials **3-0-3**
Classification, identification, and general cultural requirements of perennials, bulbs, and roses commonly used in garden planting.
Prerequisites: None. No lab fee charged.

3506 Nursery Management **2-3-3**
An introduction to techniques and practices used in the commercial production of herbaceous perennials, ground covers, deciduous shrubs and trees, conifers, and broadleaf evergreens. Greenhouse and nursery procedures and practices are emphasized.
Prerequisites: 3501, 3525. Lab fee charged.

3507 Aboriculture **3-0-3**
A study of the commercial aboriculture business. The diagnosis and treatment of tree ills, study of principles and techniques used to protect trees from disease and damage, common insects, diseases, and standard control practices; pruning, removal, etc.
Prerequisites: 3510, 3521. No lab fee charged.

3508 Turfgrass Management **2-3-3**
Principles and practices of turf establishment, maintenance adaptation, and pest control under areas of turf use.
Prerequisites: 3510. No lab fee charged.

3509 Principles of Landscape Design **2-4-3**
A course in landscape development and appreciation. Elementary drawing, lettering and the principles of art for creative design are taught.
Prerequisites: None. Lab fee charged.

3510 Horticulture and Turfgrass Management **2-3-3**
A study of the operation and maintenance of equipment used in various horticultural enterprises, especially small gasoline engines; tractors, sprayers, chain saws, and various other equipment and hand tools are demonstrated with emphasis on safety and skill.
Prerequisites: None. Lab fee charged.

3511 Landscape Construction **2-4-3**
The technique and use of materials for construction and installation of various landscape plantings, features, structures, such as gardens, terraces, walks, fences, mounds, ponds and streams, irrigation and outdoor lighting.
Prerequisites: 3509, 3518. No lab fee charged.

3515 Woody Plant Materials II **2-3-3**
A continuation of Woody Plant Materials I, covering additional deciduous shrubs and trees. Emphasis is placed on broadleaved and narrow-leaved evergreens.
Prerequisites: 3504. No lab fee charged.

3516 Herbaceous Plants II **3-2-3**
A continuation of Herbaceous Plants I, with emphasis on annual and biennial flowers, and fall flowering perennials. Landscape use of herbaceous plants is studied and design and growth of flower borders is practiced.
Prerequisites: None. No lab fee charged.

3518 Advanced Landscape Design **2-4-3**
A continuation of the principles of Landscape Design, with progressively difficult problems. Emphasis is placed on basic details of landscape architectural construction. Grading, construction, drainage, irrigation factors are examined and utilized in plan development.
Prerequisites: 3509. Lab fee charged.

3519 Landscape Contracts and Specifications **3-0-3**
A study of planting design and plan presentations. Typical plantings are examined in the field. Cost estimates, procedures, specifications and types of contracts are studied and developed.
Prerequisites: 3511. No lab fee charged.

3521 Diseases and Insects **3-1-3**
Principles and practices in diagnosing and treating plant diseases and insect problems on various horticultural crops.
Prerequisites: None. Lab fee charged.

3525 Plant Propagation **2-3-3**
Principles, techniques, methods, materials and facilities used by commercial horticulturists to propagate plants.
Prerequisites: 3502. Lab fee charged.

3528 Greenhouse Management **3-0-3**
Principles and practices of greenhouse operations including construction and environmental controls.
Prerequisites: None. No lab fee charged.

3530 Horticulture Seminar I **1-1-1**
Guest speakers and field trips dealing with current industry topics.
Prerequisites: None. No lab fee charged.

3531 Horticulture Seminar II **1-1-1**
Guest speakers and field trips dealing with current industry topics.
Prerequisites: None. No lab fee charged.

3532 Landscape Maintenance **2-3-3**
Principles and practices involved in the maintenance of ornamental plants including planting, fertilizing, pruning, pest control, and other related maintenance practices.
Prerequisites: 3521, 3508. No lab fee charged.

3534 Foliage Plants **3-0-3**
Identification, culture, and use of tropical plants as houseplants, and exotic plants cultivated in botanic gardens, conservatories and interior landscapes.
Prerequisites: None. No lab fee charged.

3540 Introduction to Floral Design **2-3-3**
A basic course dealing with principles of making simple flower arrangements and corsages. Types of designs, style, principle tools, equipment, materials, foliage and flower types are covered.
Prerequisites: None. Lab fee charged.

3541 Floriculture Production I **2-3-3**
The principles and practices of growing greenhouse crops. The emphasis will be on those crops normally grown during the fall.

Prerequisites: 3528, 3525, 3501. Lab fee charged.

3542 Retail Floral Management **2-4-3**
Principles and practices in management and operations of the retail flower shop.
Prerequisites: 3540. No lab fee charged.

3543 Floriculture Production II **2-3-3**
The principles and practices of growing greenhouse crops. The emphasis will be on those crops that are normally grown during November through January.
Prerequisites: 3525, 3528, 3501. Lab fee charged.

3544 Advanced Floral Design **2-3-3**
An advanced course in floral design dealing with more complex designs such as wedding, hospital, church and funeral work.
Prerequisites: 3540. Lab fee charged.

3545 Floricuture Production III **2-3-3**
The principles and practices of growing greenhouse crops. The emphasis will be on those crops that are normally grown during the late winter and early spring.
Prerequisites: 3525, 3528, 3501. Lab fee charged.

4000 Basic Medical Terminology **3-0-3**
An introduction to a basic medical vocabulary through word analysis, definition, spelling and pronunciation of medical and surgical terms. Emphasis on prefixes, suffixes, word roots and their combining forms. Assist in the development of a basic working medical vocabulary.
Prerequisites: None. No lab fee charged.

4001 Introduction to the Health Care System **2-0-2**
This course will acquaint students with an overall view of the health care system. Topics stressed will include history, organization, areas of specialization, roles and relationships, education, medical ethics and patient rights.
Prerequisites: None. No lab fee charged.

4002 Community Health Services **2-0-2**
A survey of community structure, agencies and health care delivery within the community setting.
Prerequisites: None. No lab fee charged.

4005 Chemistry for Health Technology **3-2-4**
This is a course designed to review the fundamental concepts of basic chemistry and provide an introduction to organic and biochemistry. Laboratory experiences will provide an opportunity for the student to perform related procedures.
Prerequisites: High school chemistry or equivalent. Lab fee charged.

4007 Emergency Medical Procedures **1-2-2**
An introduction to basic first aid including: emergency care to the sick and injured, safety awareness and habits and prevention and treatment of sudden illness or accidental injury.
Prerequisites: None. Lab fee charged.

4009 General Microbiology **3-3-4**
Fundamental microbiology including microbial cell structure, metabolism, growth requirements and ecology. An introduction to principles of immunology and control of microorganisms. Prior courses in high school biology and chemistry are recommended.
Prerequisites: None. Lab fee charged.

4010 Human Biology **3-0-3**
An introduction to cell biology, genetics, anatomy and physiology. Fulfills high school biology requirement.
Prerequisites: None. No lab fee charged.

4011 General Anatomy **2-3-3**
Complements 4012 and 4013. General anatomical principles and gross and microscopic anatomy of the major organ systems. Laboratory is primarily dissection with comparison to human anatomy.
Prerequisites: High school biology or equivalent. Lab fee charged.

4012 Human Physiology I **3-2-4**
Normal physiology of the human body including the cell membrane, biological transport, exitable tissue, the nervous system, special senses, cardiovascular system, and the endrocrine system. Lab experiences to complement and reinforce the concepts presented.
Prerequisites: High school chemistry or equivalent. Lab fee charged.

4013 Human Physiology II **3-2-4**
Normal physiology of the human body including respiration, the renal system, acid-base balance, reproduction and the gastrointestinal system.
Prerequisites: 4012. Lab fee charged.

4017 Pharmacology **5-0-5**
This course is designed to give the student a general overview of the science of pharmacology as it is employed in medical practice. General tipics covering the course include: basic principles and terminology, modes of administration, mechanisms of action and the pharmacological actions of most classes of clinically useful pharmaceutical agents. Prior courses in high school biology and college chemistry recommended.
Prerequisites: None. No lab fee charged.

4020 Fundamentals of Pathophysiology **5-0-5**
An introduction to basic disease processes including necrosis, inflamation, repair, developmental abnormalities, neoplasia, immune disorders and infectious disease. The pathogenesis of representative diseases in each category will be discussed.
Prerequisites: 4013. No lab fee charged.

4030 Technology of Education for Health **1-3-2**
Principles and techniques for planning, designing, producing, implementing and evaluating an instructional program. For health occupations students.
Prerequisites: None. No lab fee charged.

4031 Health Care Management **3-0-3**
Topics included in this course are management functions, organizational structure, line and staff relationships, position descriptions, job procedures, personnel evaluations, budgeting and general management techniques of health care institutions.
Prerequisites: None. No lab fee charged.

4050 Patient Care Skills **0-2-1**
Basic nursing including verbal and non-verbal communication, body mechanics, procedures for assisting patients to walk, patient positioning, general isolation procedures, use of restraints and vital signs. An introduction to services provided by the clinical lab is also presented.
Prerequisites: None. Lab fee charged.

4061 Contemporary Health Care Issues **3-0-3**
This course will acquaint students with health care economics and new trends and issues in health care.
Prerequisites: None. No lab fee charged.

4094 Workshops in Health Technologies **3-0-3**
Consideration and study of selected issues and topics in the health technologies area designed to meet current needs. Content and emphasis varies from year to year.
Prerequisites: None. No lab fee charged.

4099 Special Studies - Health Technologies **Var-Var-1-4**
A student initiated academic pursuit, mutually agreed upon by the student and faculty member and carried on outside the classroom. Before registration, the student must have the plan of study approved by a supervising faculty member and the Dean of Health Technologies.
Prerequisites: Varies. No lab fee charged.

4102 Nutrition for the Lifecycle **4-0-4**
The study of the nutritional needs of the lifecycle from conception through maturity. Nutritional needs are directly correlated with normal growth patterns taking into consideration the physiological, psychological and sociological changes significant to each age group.
Prerequisites: 4030. Corequisites: 4112. No lab fee charged.

4105 Introduction to Clinical Nutrition **4-0-4**
An introductory study of nutritional therapy as it relates to pathological states of the body systems. Basic nutritional assessment and counseling skills are also covered in this course.
Prerequisites: 4012. Corequisites: 4113. No lab fee charged.

4106 Nutrition in Disease **4-0-4**
An introduction to therapeutic nutrition, including the study of the pathological states of trauma and disease and their nutritional interrelationships, i.e. surgery, burns, diabetes. Also includes patient chart analysis, techniques for doing nutritional assessment, diet histories and diet instruction.
Prerequisites: 4105. No lab fee charged.

4351 Clinical Experience I **1-24-4**
Students are assigned to a clinical laboratory where previously learned theories and procedures are applied in a patient-oriented atmosphere. Students also attend a one hour weekly seminar session on campus, relating to the clinical experience.
Prerequisites: 4311. No lab fee charged.

4352 Clinical Experience II **1-24-4**
Continuation of 4351 and including the application of theories and procedures learned in 4304 and 4312. Students also attend a one-hour weekly seminar session on campus relating to the clinical experience.
Prerequisites: 4312. No lab fee charged.

4394 Workshops in Medical Laboratory **3-0-3**
Consideration and study of selected issues and topics in the medical laboratory area designed to meet current needs. Content and emphasis varies from year to year.
Prerequisites: None. No lab fee charged.

4399 Special Studies — Medical Laboratory **Var-Var-Var**
A student initiated academic pursuit, mutually agreed upon by the student and faculty member and carried on outside the classroom. Before registration, the student must have the plan of study approved by a supervising faculty member and the Dean of Health Technologies.
Prerequisites: None. No lab fee charged.

4400 Medical Terminology and Transcription **3-6-6**
Advanced Medical Terminology and Medical Transcription Medical terminology related to diseases and operations encountered in transcription of history and physical examinations, discharge summaries, operative reports, laboratory, x-ray, pathology and autopsy reports. Transcription from modern dictation machines of histories and physicals, x-ray, pathology, operative and autopsy reports and discharge summaries.
Prerequisites: Typing ability of 40 words per minute and 4000. Lab fee charged.

4401 Medical Record Science I **3-4-4**
(Introduction to Medical Record Technology and Case Record Analysis) The history of advances in medicine and medical education, hospitals and the profession of Medical Records, organization and functions of Medical Record Department, roles of RRA and ART, admitting office procedures and numbering and filing systems.
Prerequisites: None. Lab fee charged.

4402 Medical Record Science II **3-2-4**
Coding according to ICD-9-CM. Introduction to other classification systems including SNDO, SNOP, CPT, DSM-11 and Cancer Registry and Manual of Tumor Nomenclature and Coding.
Prerequisites: 4000 and 4401. Lab fee charged.

4403 Medical Record Science III **3-2-4**
(Health Statistics) Statistical procedures including calculations of daily census, monthly census and percentages. Analysis of reports including simple narration of comparative data. Vital statistics including preparation of birth and death certificates and reporting of communicable diseases. Health data retrieval.
Prerequisites: 4401. Lab fee charged.

4404 Medical Record Science IV **3-0-3**
The medical record as a legal document; confidential communication, consents and authorizations for release of medical information, preparation and presentation of the record in court; microfilming and record retention; record keeping in nursing homes and intermediate care facilities including Medicare and Medicaid Laws and J.C.A.H. standards.
Prerequisites: 4401. No lab fee charged.

4408 Advanced Medical Terminology **3-0-3**
This course will provide a continuation of the study of basic medical terminology. Terms emphasized in the areas of pathology, pharmacology, psychiatry, radiology, obstetrics, cancer medicine and other associate specialty terms.
Prerequisites: 4000. No lab fee charged.

4409 Medical Record Seminar **3-0-3**
Review of medical record science courses, anatomy and physiology, and terminology in preparation for the Accreditation Examination.
Prerequisites: 4401, 4402, 4403, 4404. No lab fee charged.

4411 Medical Record Directed Practice I **0-12-2**
Practice in the hospital medical records department performing the following admission procedures, preparation of master index cards, maintenance of patient index, correlation of records, filing procedures, preparation of medical-legal correspondence.
Prerequisites: None. No lab fee charged.

4412 Medical Record Directed Practice II **0-16-3**
Practice in the hospital medical records department performing the following proper assembling of the discharge records, daily analysis, coding of the diseases, operations and procedures by ICD-9-CM, abstracting medical data for computer input.
Prerequisites: None. No lab fee charged.

4413 Medical Record Directed Practice III **0-12-2**
Practice in hospital medical record departments performing the following: preparation of statistical reports, compiling data for PSRO, including utilization review and medical audit, experience with health records in clinics and nursing homes, and directed experience in supervision.
Prerequisites: None. No lab fee charged.

4441 Medical Terminology and Transcription I **2-5-4**
(Advanced Medical Terminology and Medical Transcription). Medical terminology related to diseases and operations encountered in transcription of history and physical examinations, x-rays, operative and pathology reports. Transcription from modern dictation machines of histories and physicals, x-ray, operative and pathology reports.
Prerequisites: Typing ability of 40 words per minute and 4000. No lab fee charged.

4442 Medical Terminology and Transcription II **2-5-4**
Medical terminology related to diseases and operations encountered in transcription of discharge summaries, and autopsies. Specialized terminology encountered in Ear, Nose, and Throat, Psychiatry, Respiratory, Genitourinary, Gastrointestinal, Cardiovascular, Neurology, Obstetrics-Gynecology, and Plastic and Reconstructive Surgery transcription. Transcription from modern dictation machines of discharge summaries, autopsies, and medical specialty transcription.
Prerequisites: 4441. No lab fee charged.

4494 Workshops in Medical Records **3-0-3**
Consideration and study of selected issues and topics in the medical records area designed to meet current needs. Content and emphasis varies from year to year.
Prerequisites: None. No lab fee charged.

4499 Special Studies - Medical Records **Var-Var-Var**
A student initiated academic pursuit, mutually agreed upon by the student and faculty member and carried on outside the classroom. Before registration, the student must have the plan of study approved by a supervising faculty member and the Dean of Health Technologies.
Prerequisites: None. No lab fee charged.

4501 Introduction to Surgery **6-0-6**
This course addresses all aspects of operating room function including environment, transport, sterilization, skin preparation, care and preparation of supplies, O.R. team members, aseptic technique, instrumentation, scrubbing and circulating responsibilities, weights and measures, and anesthesia. Includes the use of simulated O.R. lab.
Prerequisites: None. No lab fee charged.

4502 Medical-Surgical Operative Procedures I **8-0-8**
This course utilizes the content presented in course 4501 Introduction to Surgery, incorporating the content into a comprehensive study of operative procedures. This course will provide instruction in operative procedures in the field of general surgery, gynecological surgery, thoracic and vascular surgery.
Prerequisites: 4501. Corequisites: 4512. No lab fee charged.

4503 Medical-Surgical Operative Procedures II **10-0-10**
This course incorporates the study of specialized areas of surgical procedures, namely reconstructive plastic surgery, thyroid and parathyroid surgery, ear, nose and throat surgery, ophthalmic surgery, neurosurgery, orthopedic surgery, genitourinary and cardiac surgery.
Prerequisites: 4501 and 4502. No lab fee charged.

4511 Surgical Technology Clinical Experience I **0-5-2**
Practice in hospital O.R. environment and practice lab which includes orientation to O.R., proper attire, scrubbing, gowning, gloving, opening sterile packs, observing surgical procedures and assisting doctors with procedures in animal lab.
Prerequisites: None. Corequisites: 4501. Lab fee charged.

4512 Surgical Technology Clinical Experience II **0-5-2**
Continuation of course 4511 - Clinical Experience I.
Prerequisites: 4511. Corequisites: 4502. Lab fee charged.

4513 Surgical Technology Clinical Experience III **0-8-2**
Exposes the clinically experienced S.T. student to all aspects of surgery including pre-operative, operative and post-operative care of the surgical patient.
Prerequisites: 4512. No lab fee charged.

4521 Surgical Technology Clinical Practice I **1-40-7**
Students assigned to a hospital operating room, supervised by an adjunct faculty O.R. coordinator and coordinator of the College. Students also attend a one hour weekly seminar session on campus relating to the field experience.
Prerequisites: None. No lab fee charged.

4522 Surgical Technology Clinical Practice II **1-40-7**
Continuation of 4521 accompnaied with a one hour weekly seminar on campus relating to the field experience.
Prerequisites: 4521. No lab fee charged.

4523 Surgical Technology Clinical Practice III **0-10-2**
Exposes the clinically experienced S.T. student to all aspects of surgery including pre-operative, operative and post-operative care of the surgical patient.
Prerequisites: 4512. No lab fee charged.

4594 Fundamentals of OR Nursing **3-0-3**
Consideration and study of selected issues and topics in the surgical technology area designed to meet current needs. Content and emphasis varies from year to year.
Prerequisites: None. No lab fee charged.

4599 Special Studies - Surgical Technology **Var-Var-Var**
A student initiated academic pursuit, mutually agreed upon by the student and faculty member and carried on outside the classroom. Before registration, the student must have the plan of study approved by a supervising faculty member and the Dean of Health Technologies.
Prerequisites: None. No lab fee charged.

4701 Respiratory Therapy Science I **3-0-3**
History of and introduction to the field of Respiratory Therapy. Introduction to respiratory therapy equipment.
Prerequisites: Acceptance into RT program. No lab fee charged.

4702 Respiratory Therapy Science II **2-3-3**
Respiratory therapy equipment and procedures with emphasis on recognition, assembly and function of equipment used in IPPB, O2 and aerosol therapy and chest physiotherapy. Pharmacology applicable to respiratory therapy procedures is treated. Pediatric applications will also be discussed.
Prerequisites: 4701. Lab fee charged.

4703 Respiratory Therapy Science III **3-2-4**
The first part of the course is an introduction to general clinical medicine with emphasis on pulmonary disease. This course is intended to acquaint the student with disease processes which will be encountered in the patient setting. The second part of the course introduces continuous mechanical ventilation with emphasis on recognition, assembly and function of equipment and routine monitoring under supervision. Pediatric applications will be discussed.
Prerequisites: 4702. Lab fee charged.

4704 Respiratory Therapy Science IV **3-2-4**
A continuation of 4703. Additional emphasis is placed on clinical assessment of patients on mechanical ventilators.
Prerequisites: 4703. Lab fee charged.

4705 Respiratory Therapy Science V **3-2-4**
Pulmonary function testing at the bedside and in the laboratory. Emphasis is placed on the theory of pulmonary measurement, equipment and application of test results to patient care. Theory, design and application of pulmonary rehabilitation techniques are introduced.
Prerequisites: 4704. Lab fee charged.

4706 Respiratory Therapy Science VI **3-2-4**
Respiratory care for the critically ill patient. Invasive and non-invasive monitoring techniques, patient assessment and evaluation are also discussed.
Prerequisites: Acceptance into Respiratory Therapist Program or special permission. Lab fee charged.

4707 Respiratory Therapy Science VII **3-0-3**
An in-depth study of neonatal and pediatric cardiopulmonary diseases and their treatment. Identification and care of the high risk newborn discussed.
Prerequisites: 4706. No lab fee charged.

4711 Respiratory Therapy Clinical Practice I **0-10-2**
An introduction to the hospital environment with practical application of O^2 delivery apparatus, cleaning, disinfection, sterilization, and airway management.
Prerequisites: 4701. No lab fee charged.

4712 Respiratory Therapy Clinical Practice II **0-10-2**
Practical application of IPPB, humidity, aerosol therapy, chest physiotherapy and incentive spirometry. Pulmonary function testing is demonstrated.
Prerequisites: 4711. No lab fee charged.

4713 Respiratory Therapy Clinical Practice III **0-30-5**
A continuation of 4712. Neonatal applications are also treated.
Prerequisites: 4712. No lab fee charged.

4714 Respiratory Therapy Clinical Practicum I **0-30-4**
A clinical practicum in all phases of respiratory care with emphasis on patients requiring mechanical ventilation.
Prerequisites: 4713. No lab fee charged.

4715 Respiratory Clinical Practice IV **0-12-2**
Application of advanced respiratory care techniques. Emphasis on patients in the critical care setting.
Prerequisites: 4706. No lab fee charged.

4716 Respiratory Therapy Clinical Practicum II **0-24-3**
A clinical practicum which provides experience with advanced respiratory care techniques. Home care techniques, supervisory and training experiences are also included.
Prerequisites: 4707, 4715. No lab fee charged.

4720 Cardiopulmonary Anatomy & Physiology **3-2-4**
Detailed anatomy and physiology of the respiratory and circulatory systems. Emphasis is placed on those topics relevant to respiratory therapy; i.e., ventilation, diffusion, O^2 and CO^2 transport, red cell physiology, EKG and neonatal cardiopulmonary anatomy and physiology, renal physiology and acid-base balance.
Prerequisites: Acceptance into R.T. Program. Lab fee charged.

4721 Respiratory Therapy Supervision & Education **2-0-2**
Basic theories and techniques of supervision and education in relation to respiratory therapy. An introduction to lower and middle management techniques, and planning and implementation of hospital educational and training programs.
Prerequisites: None. No lab fee charged.

4723 Respiratory Therapy Seminar **1-2-2**
Student presentation of case reports and library research to their peers. Practice in NBRT testing techniques also provided.
Prerequisites: None. No lab fee charged.

4794 Workshops in Respiratory Therapy **3-0-3**
Consideration and study of selected issues and topics in the respiratory therapy area designed to meet current needs. Content and emphasis varies from year to year.
Prerequisites: None. No lab fee charged.

4799 Special Studies - Respiratory Therapy **Var-Var-Var**
A student initiated academic pursuit, mutually agreed upon by the student and faculty member and carried on outside the classroom. Before registration, the student must have the plan of study approved by a supervising faculty member and the Dean of Health Technologies.
Prerequisites: None. No lab fee charged.

6611 Technical Laboratory Chemistry I **3-3-4**
Theory of technical chemistry with application and laboratory practice - the first of a series of chemistry courses for the laboratory technician. Goggles are required. A laboratory coat or a laboratory apron is suggested.
Prerequisites: High school chemistry or equivalent and high school algebra or equivalent. Lab fee charged.

6621 Technical Laboratory Chemistry II **3-3-4**
Theory of technical chemistry with application and laboratory practice - the second of a series of chemistry courses for the laboratory techni-

cian. Goggles are required. A laboratory coat or a laboratory apron is suggested.
Prerequisites: 6611 or equivalent. Lab fee charged.

6629 Science of Materials **3-2-4**
A study of the principles basic to the physical properties of materials; examination of materials; techniques of testing materials. The materials studies are primarily metals, woods and polymers; some ceramics and composites are included. This course and course 7111 while covering the same major physical properties and tests thereof are different in emphasis. Course 6629 additionally stresses the preparation of metallographic specimens, etc., as well as implications that may or may not be possible drawn from the laboratory data.
Corequisites: Chemistry and 1191. Lab fee charged.

6631 Technical Laboratory Chemistry III **3-3-4**
Theory of technical chemistry with application and laboratory practice - the third of a series of chemistry courses for the laboratory technician. Goggles are required. A laboratory coat or a laboratory apron is suggested.
Prerequisites: 6621 or equivalent. Lab fee charged.

6639 Instrumentation and Measurement **3-2-4**
Applied black-box instrumentation including transducer elements, signal amplification, and analog and digital data recorder. Measurement topics include a study of measurement standards, error and uncertainty, accuracy versus precision, and the development of empirical equations of all types including complex wave forms generated from SHM.
Prerequisites: 6629 or 7111. Prerequisite or co-requisite: 7708. Lab fee charged.

6649 Materials Testing **3-4-5**
An application of instrumentation devices and techniques to the determination of the chemical and physical properties of matter. The course emphasizes materials and testing methods not covered in the Science of Materials course, such as concrete, fabrics, leather, and paper products.
Prerequisites: 6639, 6621. Lab fee charged.

6659 Analysis of Materials Project **3-4-5**
An application of measurement and testing technology from conception to development, design and completion of an approved project, to include the recording, compilation and reporting of project data.
Prerequisites: 6649, 6631. Lab fee charged.

6661 Chemical Contamination in the Environment **3-2-4**
Characterization of contaminations, sources, dispersions, fate of contaminants, effects on human health, environmental quality and examination of exposure limits.
Prerequisites: Basic Chemistry or equivalent. Lab fee charged.

6710 Laser Optics I **3-3-5**
Emission and absorption of photons, elements of laser, properties of laser light, optical cavities, Helium-neon gas lasers, Laser classifications and characteristics. Introduction to laser safety.
Corequisites: 1191. Lab fee charged.

6720 Laser Optics II **3-3-5**
Geom. Optics: Reflection and refraction of light, mirrors, lenses and prisms. Wave Optics: Reflection, interference, diffraction and polarization.
Prerequisites: 1191, 6710. Lab fee charged.

6730 Laser Optics III **3-3-5**
Optical Components: Optical windows, flats, filters and beamsplitters. Laser-Optic Devices: Photodetectors, laser power and energy detectors, collimators, autocollimators, beam expanders, spatial filters, electro-optic Q-switch and Laser modulators.
Prerequisites: 6720. Lab fee charged.

6740 Laser Optics IV **3-3-5**
Laser power and energy measurements; wavelength; dispersion and refractive index measurements; use of monochromators and spectrophotometers; use of Fabry-Perot, Michelson, Twyman-Green and Mach-Zehnder interferometers.
Prerequisites: 6730. Lab fee charged.

6750 Laser Optics V **3-3-5**
Laser material processing, cutting, drilling and welding; air pollution monitoring with lasers; data processing and data display; optical memories; holographic non-destructive testing; medical applications of lasers; optical communication systems.
Prerequisites: 6740. Lab fee charged.

6999 Special Problems Seminar/Project **Var-Var-Var**
Individual study and/or special project assigned in students' technical field of study. Available to fourth and fifth term students by special arrangement with coordinator and dean.
Prerequisites: None. Lab fee charged.

7000 Engineering Technologies Orientation **1-0-1**
Designed to familiarize the engineering student with the operations and policies of the Engineering Division, his/her career field, employment trends and cooperative employment responsibilities. Topics to include: academic requirements, program option, recommended and non-technical electives, etc. Required for all incoming freshmen during their first term in school. Waiver of this requirement because of special circumstances such as re-entry students, transfer students, etc. can be obtained from the Divisional Coordinator of Academic Affairs.
Prerequisites: None. No lab fee charged.

7005 Basic Blueprint Reading and Sketching **2-2-3**
Provides a working knowledge of blueprint reading and shop sketching with special application and emphasis for different technologies. Technical terminology is defined and applied in a logical sequence for each new principle.
Prerequisites: None. Lab fee charged.

7008 Basic Engineering Drawing **2-4-3**
Techniques and functions of drafting. Use of technical terms, drafting equipment, lettering, single and multi-view projection, dimensioning, sections and primary auxiliary views.
Prerequisites: 1170. Lab fee charged.

7009 Engineering Graphics (Aviation) **1-4-2**
Read drawings, symbols and schematic diagrams. Draw sketches of repairs and alterations. Apply blueprint information. Use graphs and charts. Identify and select AN hardware.
Prerequisites: None. No lab fee charged.

7010 Engineering Drawing **2-4-3**
Auxiliaries, sections and conventions, dimensioning and tolerancing systems, gears, cams, piping, etc. Emphasis on detail, assembly, and working drawings.
Prerequisites: 7008. Corequisite: 1171 or 1191. Lab fee charged.

7011 Engineering Graphics II **2-4-3**
Provides an in-depth knowledge of mechanical design practices and standards used in industry, while developing additional mental physical skills required in mechanical design work. Use of mathematics is required in resolving drawing assignments with gears, cams and sheet metal drawings.
Prerequisites: 7010. Corequisites: 1172 or 1191. No lab fee charged.

7012 Engineering Graphics III **2-4-3**
Principles of design sketching, design drawings, layout drafting, detailing from layout drawings, etc. Emphasis on continued development of skills. Designed primarily for the non-coop student.
Prerequisites: 1191, 7011. Lab fee charged.

7013 Descriptive Geometry **2-2-3**
Graphic analysis of space positions involving points, lines, planes, connectors and a combination of these. Practical design problems stressed with analytical verification where applicable. To include: intersections and developments of planes and solids.
Prerequisites: 7010, 1191. Lab fee charged.

7016 Engineering Graphics (Intersections & Developments) **2-2-3**
Principles involved in intersections and developments of planes and solids. Emphasis on parallel-line, radial-line, and triangulation method of development.
Prerequisites: 1191, 7008. No lab fee charged.

7017 Steel Fabrication (Graphics) **2-2-3**
The theory and practice of developing working drawings of steel fabrication and construction design considerations. Emphasis on weld symbol interpretation. Principles of layout of plate metals.
Prerequisites: 7010, 7113. Lab fee charged.

7018 Electrical Drafting & Design **1-3-2**
Provides a drawing knowledge of electrical power symbols, ANSI designations, and blueprint reading. Includes: schematics, one-line diagrams, raceway layouts, motor control ladder diagrams, riser diagrams, cable and fixture schedules, grounding systems, lighting layouts, power distribution and protective devices, and basic architectural concepts and terminology.
Prerequisites: 7008. Lab fee charged.

7024 Civil Engineering Graphics I **2-4-3**
Techniques and functions of drafting. Development of individual skills with emphasis on construction draftings. Floor plan layout, structural section views, building elevations, architectural details, electrical plans, standard symbols, dimensioning methods, perspective and presentation drawings.
Prerequisites: 1171, 7911. Lab fee charged.

7025 Civil Engineering Graphics II **1-4-2**
Preparation of contour maps from field data, grading plans, cross-sections, earthwork volume calculations, graphical deed abstracts, mortgage inspection drawings, boundar plats and topographic maps.
Prerequisites: 7910, 7024. No lab fee charged.

7030 Computer Programming (Basic) **2-2-3**
Principles of programming, flow charting and coding in Basic language. Lecture and lab problems to show applications in design calculations, automatic control, design optimization, quality control and planning.
Corequisites: 1171 or 1191. Lab fee charged.

7031 Computer Programming (Fortran) **2-2-3**
Principles of programming, flow charting and coding in Fortran language. Lecture and lab problems to show applications in design calculations, automatic control, design optimization, quality control and planning.
Prerequisites: 1171 or 1191. Lab fee charged.

7032 Introduction to Computer Programming (Civil) **3-2-3**
Terminology and basic concepts of automation, introduction to Fortran programming with applications in surveying and construction.
Prerequisites: None. Corequisites: 7920, 2292. No lab fee charged.

7033 Computer Simulations **3-2-3**
Introduction to computer modeling, simulations and graphics.
Prerequisites: 1134 or 1722 or 1772 or 7030 or 7031 or 7032 and 1192. No lab fee charged.

7040 Industrial Supervision & Management **3-0-3**
Analysis of the structure of industrial organizations with emphasis on the responsibilities of a supervisor and the production team. Covers employee's responsibilities within the corporate structure. Students will acquire an understanding of and an appreciation for the roles of worker, supervisor and manager within the American corporate and social working spheres. The importance of each individuals contribution toward insuring a stable economy via effective productivity and technological growth within the industrial community is covered in detail.
Prerequisites: None. No lab fee charged.

7102 Machine and Hand Tool Laboratory **1-4-3**
Principles and processes which underlie the use of hand tools, cutting tools, portable equipment and accessories, measuring devices and gauges. Emphasis placed on developing sound trade judgement, safe work habits, and correct work procedures.
Prerequisites: None. Lab fee charged.

7103 Machine Processes I **1-4-2**
An introductory course designed to acquaint the student with basic hand tools, safety procedures and machine processes in our modern industry. It will include a study of measuring instruments, characteristics of metals and cutting tools. The student will become familiar with the lathe family of machine tools by performing selected operations such as turning, facing, threading, drilling, boring, and reaming.
Corequisites: 1191 or 1171. Lab fee charged.

7104 Machine Tools & Manufacturing Processes **3-3-3**
Designed to acquaint the student with the various machines used in manufacturing. To include: measuring instruments, characteristics of metals and cutting tools, manufacturing processes, etc.
Prerequisites: None. Corequisite: 1171 or 1191. Lab fee charged.

7111 Engineering Materials **3-2-3**
Study of the principles basic to the physical properties of materials; examination of materials; techniques of testing materials. Students enrolled in this course should expect to spend at least two hours per week gaining actual hands-on laboratory experience.
Prerequisites: None. Corequisite: 1191. No lab fee charged.

7113 Materials Processes & Fabrication **4-2-4**
Designed to acquaint the student with the various methods available to join different materials. Special emphasis on metals, plastics, and rubber compounds joining to insure permanent bonding to required engineering specifications. Also review of metal and plastic fabrication in machining and forming.
Prerequisites: 7111. Lab fee charged.

7114 Machine Processes II **2-4-3**
Emphasis on grinding & milling. To include turning, boring, electrical discharge, etc.
Prerequisites: 7103 or equivalent, 1171. Lab fee charged.

7121 Metallurgy of Materials **3-2-3**
To include structure and property of metals. Covers the fields of extra-active and physical properties. Course work includes studies of crystal formation, grain structure, hot and cold working, heat treatment, and control of mechanical properties.
Prerequisites: None. No lab fee charged.

7130 Statics (Mechanical) **3-2-3**
A review of the basic principles of the simple coplanar force systems. To include moments and couples, equilibrium, etc. Specific emphasis on trusses, frames, space force systems, friction, centroids and centers of gravity, moments of inertia, transfer formula, radius of gyration, etc. To also include the concepts of stress/strain relationships.
Prerequisites: 1191, 2292. No lab fee charged.

7132 Hydraulics and Pneumatics I **3-2-3**
Basic principles of hydraulics and pneumatics. Includes the physical laws. Application in design circuits and systems governing liquids and gases with application into fluid power systems. In-depth study of fluid power components including pumps, pressure, and directional and flow control valves, actuators and miscellaneous components. Introduction into graphical symbols and circuits.
Prerequisites: 1171, 2291. No lab fee charged.

7135 Fluid Power Systems **4-4-4**
Basic principles of hydraulics and pneumatics. Covers the generation, distribution and control of fluid power. Applications in fluid mechanics includes pumps, flow, pressure and directional valves. An in-depth study of hydraulic and penumatic symbols and circuitry. A comprehensive study in the fundamental concepts of servo-hydraulics, air logic and control systems.
Prerequisites: 1191 & 2291. No lab fee charged.

7140 Strength of Materials **4-2-4**
Effects of forces and stresses on materials in various forms and configurations found in engineering and mechanical construction. Topics of study include simple, torsional and bending stresses, combined stresses, deflection, columns, (Eulers equation), continuous beam (three moments theorem), etc.
Prerequisites: 1192, 2292. No lab fee charged.

7141 Design Economics **2-2-3**
Cost analysis of design considerations in view of manufacturing processes, product functional requirements and dimensional guaranteed interchangeability factors. Students complete cost studies for a variety of products produced by a variety of manufacturing processes.
Prerequisites: 7010. No lab fee charged.

7142 Mechanisms Analysis **3-2-3**
This course provides an introduction to the analysis and design of mechanisms. The course involves mathematical and graphical solutions of problems involving the kinematics of mechanisms and the interaction of their components, including the study of the displacement, velocity, and acceleration of points within the mechanism. Cam analysis and design is introduced, with particular emphasis on pressure angles and follower motions. An introductory study of gears and gear trains is included.
Prerequisites: 1192, 2291. No lab fee charged.

7144 Systems Development - Numerical Control **1-2-2**
Introduction to automated or numerical control equipment. Emphasis on tape control systems - writing of programs and lab experience in implementing these programs - machine tool and graphic applications.
Prerequisites: 7103, 1191. Lab fee charged.

7145 Statics and Strength of Materials **3-2-3**
A survey course intended for the non-design oriented student. Effects of forces and stresses on materials in various forms and configurations found in engineering and mechanical construction. Use of mathematics in analyzing forces, stresses, moments and equilibrium by use of centroids and moments of inertia. Determination of dimensions and material specifications.
Prerequisites: 1192, 2292. No lab fee charged.

7146 Electro-Mechanical Control I (Servo Mechanisms) **4-3-4**
Introduction to transducer feedback systems. Analog control of levels, velocities, positions, etc. of output devices such as hydraulic actuators and D.C. drives. Servo-control techniques through the use of digital circuits including microprocessors. Topics to include open and close loop systems, feedback, resolution, accuracy, repeatability, transient response analysis, stabilization circuits, dampening, types of comparators, gray code encoders, leadscrew control, and stepping motors.
Prerequisites: 7731, 7732. Lab fee charged.

7147 Tool, Jig & Fixture Design **3-2-3**
A course designed to acquaint the student with the production devices required in the manufacturing of finished products. Special emphasis toward designing the tools with the movements as short in distance as possible and of the lowest order of complexity, whereby operator fatigue, both physical and psychological, is kept to a minimum.
Prerequisites: 7010, 1191. Lab fee charged.

7149 Computer Applications (CNC-NC) **2-2-3**
Introduction to automated equipment. Emphasis on direct computer control and includes tape control systems. Experiments include writing of programs and implementations, machine tool and graphic applications.
Prerequisites: 1191, 7104. Lab fee charged.

7150 Machine Design **4-2-4**
Principles of mechanics and strength of materials as applied to components of mechanisms and power trains as well as beams, pressure vessels, weldments, springs and other bodies under static load and dynamic loads. Shafts, gears, couplings, threaded units, and riveted constructions are treated in detail.
Prerequisites: 7140. No lab fee charged.

7151 Tool Engineering Design **3-2-3**
A study and analysis of cutting, forming, and drawing sheet metal, using modern tools and dies. Application of mathematics and mechanics to determine forces and stresses occurring in these metal working operations. Provides experience of designing a die to produce a simple sheet metal product. Also includes jig and fixtre design.
Prerequisites: 7140. No lab fee charged.

7152 Hydraulics & Pneumatics II **1-2-2**
An in-depth study of hydraulic and pneumatic schematics and circuitry. A comprehensive study in the fundamental concepts of servo hydraulics, air logic and control systems, application in design circuits and systems.
Prerequisites: 7132. No lab fee charged.

7154 Numerical Control Compact 2 **2-3-3**
An in-depth course in Compact 2 computer language for numerical control of machine tools using computer assisted calculations and debugging. Emphasis placed on defining geometry of a part and tool motions required to machine a part. Course directly applicable to Mill & Drill.
Prerequisites: 1191, 7103, 7144 or a familiarity with machine tools and a basic knowledge of geometry and trigonometry. No lab fee charged.

7155 Machine & Product Design **4-2-4**
Application of principles of mechanics and strength of materials to design of machine elements. Dynamic loading condition. Research to solve a problem in design by consulting various manuals, periodicals, etc.
Prerequisites: 7150. No lab fee charged.

7156 Electromechanical Design **2-8-4**
A course intended to exercise the student's knowledge of electromechanical systems. It provides the time and opportunity for students to work on the design, fabrication, assembly and troubleshooting of electro-mechanical devices and systems. The design is to include ideas covered in most of the student's previous core courses of study. The purpose is to promote independent study, initiative, and creativity by requiring the student to develop the design problem with minimal staff supervision.
Prerequisites: 7146. No lab fee charged.

7157 Electro-Mechanical Controls II (Microprocessor Applications) **3-3-4**
To include memories, RAM's, ROM's, PROM's, E-PROM's, etc. Microprocessors and microcomputers, architecture, CPU, bus structure, interrupt and stack processing. Special emphasis on applications with I/O ports.
Prerequisites: 7146. Lab fee charged.

7158 Microprocessor Applications **3-2-3**
Survey course of microprocessors and their uses in current industrial environments. Included will be a brief discussion of the function of a microprocessor system. The duration of the course will then consider the uses of the microprocessor in the following areas: machine control, measurement of processes, diagnostic aids, inventory control, time and motion studies, planning and layout of equipment, and such areas as determined by current industrial trends. Students will be involved in projects and lab work which demonstrates classroom concepts.
Prerequisites: 7402. No lab fee charged.

7159 Manufacturing Methods and Cost Control **3-2-3**
Starting with a part print, the student learns to select and plan the manufacturing processes and sequence to produce the part, taking into consideration quality, quantity, and cost. To incorporate process engineering techniques.
Prerequisites: 7104, 7113. No lab fee charged.

7160 Microprocessor Interfacing **2-2-3**
Advanced programming applications to solve problems in machine design manufacturing processes, mechanism analysis, etc. Use of the microprocessor for modeling simulation programs. Data acquisition and analysis of measurement and testing. Students will select projects in their technology and develop the programs.
Prerequisites: 7030 or 7031. No lab fee charged.

7199 Special Problems Seminar — Mechanical **2-4 Credit Hours**
Individual and independent study and special projects pertaining to the particular technology in which the student is enrolled. The study may deal with an idea or concept normally not covered by existing courses at the college, or with a specific problem found in the industry in which the student is employed. Open to fourth and fifth term students, by special arrangement with the Coordinator and Divisional Coordinator of Academic Affairs.
Prerequisites: Varies. No lab fee charged.

7301 Introduction to Plastic Processes **3-2-3**
An introductory survey course for the student who desires a brief but overall coverage of the major types of plastics and plastic processes. Includes the manufacturing techniques and principles of operation of injection, extrusion and vacuum forming equipment.
Prerequisites: None. No lab fee charged.

7310 Plastic Processes — Compression & Transfer **4-2-4**
Molding methods used for conversion of thermoset materials into useful products. Properties of thermosets, such as mechanical, physical, thermal, and test methods. Chemistry of thermoset polymers.
Prerequisites: None. Lab fee charged.

7311 Plastics Processes — Thermoforming Methods **3-2-3**
Special molding methods used to produce plastic articles from film and sheets by a variety of procedures; review of thermoplastic sheets and film materials and their properties.
Prerequisites: None. Lab fee charged.

7315 Fiber Reinforced Plastics, Laminates and Castings **3-3-3**
Resin systems and fiber reinforcement used in production of FRP products. Materials and processes of laminates. Fabrication procedures, comparative properties.
Prerequisites: 7111. No lab fee charged.

7320 Plastics Processes — Injection, Extrusion **3-3-4**
Molding methods used to convert thermoplastic-materials into designed products. Properties, materials evaluation, test methods chemistry of thermoplastic materials.
Prerequisites: 7310. Lab fee charged.

7342 Product, Mold & Tool Design 3-3-3
Design of molds and tools for plastics processing. Emphasis on part design, and design of production aids such as tools, jigs and fixtures; for after finishing and quality control of molded and fabricated plastic products.
Prerequisites: 7310. No lab fee charged.

7402 Manufacturing Processes 3-0-3
Survey of the fundamentals of manufacturing processes. Methods of manufacturing and fabricating metal and plastic parts. To include: power metallurgy, electro-chemical, automatic metal working machines, welding, etc.
Prerequisites: None. No lab fee charged.

7409 Industrial Safety & OSHA 3-2-3
Study of industrial safety programs, safety codes and standards, compensation, and safety inspection. Survey of selected occupational health hazards; solvents, lead, asbestos, welding, heat, noise, etc. Typical industrial policies and facilities for accidents and injuries. Safety devices for equipment and safety education programs. Special emphasis given to "The Occupational Safety and Health Act" and its special reporting requirements.
Prerequisites: None. No lab fee charged.

7410 Materials Handling 3-2-3
Project course with heavy emphasis on materials flow analysis. Examine material handling elements such as material characteristics, material classifications, unit load, packaging, bulk handling, containerization, selection of equipment, economics of a material handling plan or phased improvements; selected industry problems and trends are analyzed.
Prerequisites: None. Lab fee charged.

7430 Time and Motion Study 3-2-3
Principles of motion economy, tools for time and motion study to include process and operation charts, the movie camera, videotape, stop watch. Includes study and application of the basic principles used to develop better methods of performing work, and maintain audit and control functions, survey of standard data systems, implement cost reduction proposals.
Prerequisites: 1171 or 1191. Lab fee charged.

7440 Industrial Processes & Plant Layout 3-4-4
Project course with emphasis on the most efficient arrangement of a production area and process arrangement to achieve effective utilization of space and equipment in manufacturing and service industries. Layout of aisles and use of cube space. To include layouts for small and medium size design, the characteristics of industrial processes and how instrumentation is used for process control. Analysis of sequence of Flow and/or Assembly. Facilities audit.
Prerequisites: 7410, 1171 or 1191, 7104. Lab fee charged.

7441 Quality Control 3-2-3
Application of statistics and probability to basic quality control problems. Survey of functions, responsibilities, structure, costs, reports, records, personnel and vendor-customer relationships in quality control. Sampling inspections, process control, and tests for significance.
Prerequisites: 1191. No lab fee charged.

7450 Production Cost and Control 3-0-3
Development of cost estimation techniques, practical application of production cost theory, control of material and labor cost, overhead application, determination of time requirements, estimation of production costs and impact of production mix on costs. Product life cycle analysis.
Prerequisites: 7430, 7441. No lab fee charged.

7451 Industrial Engineering Technology Project 2-5-3
Application of concepts, procedures, and methodologies developed in several Industrial Engineering Technology courses to a selected student project. To provide an interractive, discussion oriented, functional experience in an industrial scenario. Includes update on trends in management techniques.
Prerequisites: 7430, 7440. No lab fee charged.

7452 Industrial Hygiene Measurements 3-2-3
Sampling, measurement and calculations of air flow, heat, noise, gas, oxygen, particulate, and toxic levels in the industrial environment. Survey of effects of toxics, noise, heat, particulate concentrations on the human body. Includes area ventilation, heat stress, noise characteristics, measurements. Use of selected instrumentation to establish compliance with standards set by governmental and industry groups.
Prerequisites: 7409. No lab fee charged.

7501 H.V.A.C. — Plant Maintenance 3-2-3
An introduction to the thermodynamic laws pertaining to refrigeration. The refrigeration cycle, operation, maintenance and troubleshooting of components including water towers, condensers, water treatment and refrigerants, copper pipe and tubing sizing, flaring, swaging, and soldering. Pump maintenance procedures, inspection and overhaul. Operation of boilers, oil burners, gas furnaces and heaters. General plant maintenance procedures.
Prerequisites: None. Lab fee charged.

7510 Elements of Refrigeration 4-2-5
Introduction to the field and terminology of Refrigeration. Topics to include the basic laws of refrigeration, heat, and the methods of heat transfer, use and care of servicing tools, equipment, tubing, and fittings, compressors, refrigerants, temperature controls, special testing and service equipment. Laboratory sessions provide experience in basic service procedures.
Corequisites: 1171 or 1191. No lab fee charged.

7520 Elements of Heating 3-2-3
Introduction to gas and oil furnaces and heat pumps. Topics include the fabrication, troubleshooting and servicing of these heating devices.
Prerequisites: 7510, 7701. No lab fee charged.

7530 Air Conditioning Principles I 3-2-3
Study of cooling towers, evaporating condensers, water treatment, air cooled condensers, refrigeration safety devices, crankcase heaters, water chillers, and pumps. Laboratory experience to emphasize equipment, maintenance and troubleshooting procedures.
Prerequisites: 7510, 7701. Lab fee charged.

7531 Air Conditioning Applications 3-2-3
A survey of commercial and industrial applications of heating, refrigeration and air conditioning; ventilation; food preservation and storage; industrial processing; low temperature applications; comfort air conditioning applied to transportation vehicles, etc. The requirements, limitations and standards involved in the many applications are investigated.
Prerequisites: 7510, 7530. Lab fee charged.

7532 Sheet Metal Installation Techniques 2-2-3
A study of some of the more common problems encountered during installation and modifications, particularly the mechanical and field fabrication problems involved in duct work, piping, and electrical work. Introduction to the use of sheet metal tools, edges, seams, locks, etc.
Prerequisites: 7510. Corequisites: 7016. No lab fee charged.

7540 Air Conditioning Principles II 4-2-4
Psychrometrics, heat transfer and fluid handling equipment. Fans and fan laws, centrifugal water pumps, sizing of piping and duct work, procedures for determining building heat losses, and methods of rating and selecting equipment as presented in manufacturer's catalogs. Laboratory sessions provide detailed investigations of the operating characteristics of the equipment discussed in the theory courses.
Prerequisites: 7530. Lab fee charged.

7541 Air Conditioning Design I 4-2-4
The application of air conditioning principles to design. Emphasis on selection of equipment, consideration of applicable codes, and functional handling of air conditioning design problems. In the laboratory sessions the student designates heating and cooling systems. Incorporated are design calculations, equipment selection and system layout.
Prerequisites: 7520. No lab fee charged.

7550 Air Conditioning Principles III 3-2-3
An advanced study of refrigeration systems, especially of industrial equipment, thermodynamic principles, cycle analysis, operational and construction features, and system applications are covered. Specific subjects include low temperature systems such as cascade and two-state units, absorption systems, heat-pumps, centrifugal compressors and control systems. Precedures for sizing, selection and layout of refrigeration system components and piping.
Prerequisites: 7540. No lab fee charged.

7551 Air Conditioning Design II 3-4-4
This subject involves the calculation of the conditioning load, system

design and layout, equipment selection, and complete specifications for such applications as year-round comfort air conditioning systems, industrial processing plants, and special environment control units. Cold limitations, control requirements, humidity control, solar load calculations, human comfort and industrial conditioning problems are included.
Prerequisites: 7540, 7541, 7532. Corequisites: 7550. No lab fee charged.

7552 Air Conditioning Controls **3-2-3**
The theory and methods of controlling conditioned air systems. Types, functions and applications of controls for heating, cooling, humidity, and ventilation requirements. Laboratory sessions allow the student to make connection of systems components and simulate operational characteristics of electric, pneumatic and electronic control systems.
Prerequisites: 7702, 7540. No lab fee charged.

7700 Electrical Concepts (Pre-Engineering Tech.) **3-2-3**
Designed for the student with limited formal background in electrical fundamentals. Introduces the basic concepts of DC circuits. Topics include electrical terminology, laws of electricity, series circuits, parallel circuits, power, etc. For students oriented in electrical programs.
Prerequisites: 1170. Corequisite: 1171. No lab fee charged.

7701 Electrical Fundamentals I **3-2-3**
Introduces the basic laws of AC and DC electricity and their applications. In addition power distribution, magnetic principles, control system fundamentals, component testing and troubleshooting are covered.
Prerequisites: None. Corequisite: 1171. No lab fee charged.

7702 Electrical Fundamentals II **3-2-3**
A continuation of Electrical Fundamentals I. AC power factor, polyphase relationships, and control systems functions are examined in greater depth. Abilities of the student to plan, assist, and supervise electrical power, and control system installations, and modifications are developed.
Prerequisites: 7701. No lab fee charged.

7704 Basic Industrial Electricity **3-2-3**
A comprehensive introduction to applied electrical circuits; current, voltage, and resistance measurements; Ohms law in series and parallel circuits; magnetism, wiring practices; electrical energy and power; concepts of capacitance, inductance and transformers; AC and DC motor fundamentals; fundamentals of motor control; development, analysis and troubleshooting of motor control circuits; basic concepts of static control for non-electrical technology majors.
Prerequisites: 1170. No lab fee charged.

7708 Electrical Fundamentals and Controls **4-2-4**
A survey of the field of electrical/electronics controls. Topics to include basic circuit analysis, relay logic control (ladder diagrams), programmable controls, analog and digital electronic devices including microprocessors. Topics coverage will include real world examples and applications. For students in non-electrical programs.
Prerequisites: None. Corequisites: 1171 or 1191. Lab fee charged.

7710 D.C. Circuit Analysis **6-3-5**
Introduces the concepts of electrical units, circuits, and measurements, including series, parallel, series-parallel and basic inductance and capacitance concepts. D.C. Circuits are analyzed using Network analysis methods and basic Algebra. Instruments taught include V.O.M., V.T.V.M., and D.C. power supplies.
Prerequisites: None. Corequisites: 1172 or 1191. No lab fee charged.

7720 A.C. Circuit Analysis **6-3-5**
Inductive and capacitive time constants; AC signal generation and values, reactance, impedance, RC, RL and RCL circuits and transformers. Phasor diagram, Polar and Rectangular math. Instruments taught in AC circuits include: Oscilloscope, Function Generator, Frequency Counter, and VTVM for AC application.
Prerequisites: 7710. Corequisite: 1192. No lab fee charged.

7725 Electrical Lighting Design **3-0-3**
Basic principles of light and sight and the characteristics of light. Quantity and quality measurements of lighting. Recommended levels and distribution of illumination. Types of light sources, lamp design, operating and performance characteristics. Light control and luminaire design. Exterior and interior lighting methods and calculations. Industrial, commercial and office lighting. Energy management in lighting design.
Corequisites: 7720. No lab fee charged.

7730 Electronics I **6-3-5**
Semiconductory theory, pn junctions. Diode equivalent circuits. Rectifier circuits. Biopolar transistors. Transistor biasing circuits. AC equivalent circuits. Small signal amplifiers. Class A amplifiers. Class B push-pull amplifiers.
Prerequisites: 7720. No lab fee charged.

7731 Digital Systems I **3-3-4**
Number systems, codes and review of Boolean Algebra. Logic families, logic simplification methods and implementation of logic equations using NAND and NOR gates and Flip-flops.
Prerequisites: 1192, 7708 or 7710. Lab fee charged.

7732 Industrial Control Electronics **6-3-5**
Basic principles of the PN junction. Applications toward rectification, clipping and other wave shaping techniques. Principles, applications and selection of amplifiers, with an emphasis on operational amplifiers. Selection, calibration techniques and system operation of transducers; including position, pressure, flow, temperature, light, acceleration and velocity measurement.
Prerequisites: 7720. No lab fee charged.

7734 Electrical Machinery & Controls **3-3-4**
Study of DC generator and motor principles, including selection, maintenance, and rating DC machinery. Manual and automatic starters and speed control. DC power supplies and drives.
Prerequisites: 7720. No lab fee charged.

7735 Elements of Power Electronics **3-2-3**
Survey of semiconductor devices to include diodes, transistors, I.C.'s, OP amps, SCR's, and triacs; their circuit application such as rectification, amplification, filtering, and signal processing; solid state controls and electronic interface with motor systems, including transducer devices and closed loop principles.
Prerequisites: 7720 or 7702 or 7708. No lab fee charged.

7736 Wiring Systems **3-2-3**
Conductors and raceways, power triangle, three-phase systems, transformers, motor wiring fundamentals, system grounding, equipment grounding, load calculations for branch circuits and feeders, electric space heating, national electrical code.
Prerequisites: 7720. No lab fee charged.

7740 Electronics II **4-2-4**
Field-effect transistors. FET circuit analysis. Decibel and Miller's theorem. Frequency effects, integrated circuits. Negative feedback. Feedback oscillators. Frequency domain. Voltage regulation.
Prerequisites: 7730 or 7732. No lab fee charged.

7741 Digital Systems II **3-3-4**
Includes edge triggered circuitry; j-k flip-flops, Sync and Async counters, shift registers, clock circuits, monostable theory. Also incoders, decoders, multiplexing (time base) displays. Circuit design techniques using MSI IC's will be discussed.
Prerequisites: 7731, 7720. Lab fee charged.

7743 EL Communications Systems I **4-2-4**
AM, FM, TV space, and mobile communications systems. To include RF amplifiers, Oscillators, mixers, AM and FM Detection, wave propagation, circuit noise antennas, and basic broadcasting station requirements.
Prerequisites: 7730. No lab fee charged.

7744 AC Machinery & Controls **3-3-4**
Study of AC generators and motors, including selection, maintenance, and rating AC machinery. Manual and automatic starters and speed control. Also includes digital controllers.
Prerequisites: 7734. No lab fee charged.

7745 Digital Power Electronics **3-2-3**
Survey of digital systems to include logic gates, flip-flops, counters, registers, data movement, memory systems and microprocessor based controllers.
Prerequisites: 7735. Lab fee charged.

7746 Industrial Power Distribution **3-1-3**
Fundamentals, motor circuits, system voltage variation, power factor, protective devices grounding, system planning, medium voltages, protective relaying, and energy management in power distribution.
Prerequisites: 7734 and 7736. No lab fee charged.

7749 Biomedical Instrumentation I **3-2-3**
Course consists of a survey of biomedical instrumentation and the physiological concepts that are transduceable to electronic instruments. Lower orders of complexity are studied in the Biomedical Instrumentation I course, many having consumer electronic analogies. In addition, most of equipment studied is high volume use in the health care facility and is likely to be most frequently encountered by the course graduate. Primary emphasis is given to cardiovascular measurement devices.
Prerequisites: 7720, 4012. Corequisites: 7730, 7731. No lab fee charged.

7750 Electronics III **4-2-4**
Differential and operational amplifiers, feedback amplifiers, PNPN devices, Discrete pulse and digital circuits, regulators, optoelectronics.
Prerequisites: 7740. No lab fee charged.

7751 Digital Systems III **3-3-4**
Includes memories, ram's, roms, proms, eproms, also ALU units with A/D and D/A conversions. Continues with microprocessors, microcomputers, architecture, CPU, Bus Structure, interrupt and stack processing. Interfacing of microprocessors with laboratory sysems will be discussed.
Prerequisites: 7741. Lab fee charged.

7752 Electronics Project **1-5-3**
Application project involving specifications, design, construction, testing, troubleshooting and formal report.
Prerequisites: Open to fourth and fifth term EL, EB, and EM students. Lab fee charged.

7753 Communication Systems II **4-2-4**
This course covers the analysis and design of circuitry required for communications systems including tuned circuits, phase locked loops, AM-FM and pulse detectors, modulators, linear amplifiers, power amplifiers, transmitters, receivers, transmission lines, wave guides, microwave transmissions, antennas, radar and facsimile.
Prerequisites: 7743. Corequisites: 7754. No lab fee charged.

7754 FCC License Preparation **3-0-3**
Preparation for FCC radio-telephone operators licenses. Technical and legal aspects.
Prerequisites: 7743. Corequisites: 7753. No lab fee charged.

7755 Electrical Estimating **2-3-3**
Blueprint reading, take-off techniques, specifications, estimating procedure, unit pricing, pricing sheets, summary sheets, proposals, checking methods, computerized estimating techniques.
Prerequisites: 7746. Lab fee charged.

7756 Power Generation & Transmission **3-1-3**
Survey of coal, oil, nuclear, and hydroelectric generation; circuit constants, assemblies of power system components, load flow studies, transients, power limits for stability, faults on power systems, instrumentation, relays and interrupting devices, insulation, tower design, and effective grounding techniques.
Prerequisites: 7018 and 7746. No lab fee charged.

7757 Electrical Preventive Maintenance **3-2-3**
Insulation testing and maintenance, batteries, troubleshooting and emergency repair of rotating equipment, transformer maintenance, mechanical maintenance of electrical machinery and controls, overcurrent device maintenance, distribution system maintenance, and economics, stocking and tooling.
Prerequisites: 7744 and 7746. No lab fee charged.

7758 Industrial Motors & Controls **3-2-3**
Fundamentals, applications and selection of DC and AC motors including speed torque characteristics, horsepower and efficiency calculations. Magnetic and static control circuits emphasizing equipment and personal protection, across the line starting acceleration methods, speed control, reversing, plugging, breaking, and jogging will be analyzed, constructed, designed, and diagnosed during improper operation.
Prerequisites: 7720. No lab fee charged.

7759 Biomedical Instrumentation II **4-2-4**
Course presents a survey of the more complex and specialized devices used for patient care and diagnosis. Advanced equipment malfunction isolation and test instruments is presented. Maintenance management including records, stock level optimization, shop layout, forms and technician duties is discussed. Consideration is given to the ethics related to biomedical equipment servicing.
Prerequisites: 7749. No lab fee charged.

7761 Advanced Microprocessor Systems **3-3-4**
Design of Microprocessor systems with expansion of small systems to larger systems using bread boarding techniques. Hardware and software troubleshooting of computer systems. Assembly language programming using resident and cross assembler techniques. Investigation of high order languages. Discussion of current mass storage devices. Students will also work on projects in their area of interest.
Prerequisites: 7751. Lab fee charged.

7799 Special Problems Seminar - Electrical **Var-Var-Var**
Individual study and special projects pertaining to the particular technology that the student is enrolled in. Open to fourth and fifth term students, by special arrangement with the Coordinator and Division Dean.
Prerequisites: None. No lab fee charged.

7810 Welding Skills **3-3-3**
Basic gas welding. Safe and correct methods of assembling and operating of welding equipment. Introduces the student to joining of metals based on fusion, diffusion, chemical and mechanical methods. Specific laboratory work will involve the oxyacetylene cutting, heating, soldering, brazing, and welding skills.
Prerequisites: None. Lab fee charged.

7811 Welding Processes & Techniques **3-3-3**
Introduction to the use and technical aspects of basic and oxy-fuel welding processes. Studies are made of various welding process factors such as heat, polarity, electrode application. Laboratory experience to include joining of mild steel. Gas metal arc welding (MIG welding) theory and application are also introduced. The American Welding Society designation of GMAW, OAW, and SMAW apply to this course.
Prerequisites: None. Lab fee charged.

7820 Shielded Metal Arc Welding Processes **3-3-4**
The operation of AC and DC arc welding equipment. Studies are made of welding heat, polarity, electrode application. Laboratory experience to include joining of commonly used metals. GAS metal arc welding (MIG welding) theory and application are introduced. The American Welding Society designation of GMAW and SMAW both apply to this course.
Prerequisites: 7810. Lab fee charged.

7821 Fabrication Processes & Techniques I **3-3-3**
Beginning course covering various fabrication operations in areas of welding pertaining to joining of metals and plastics. Abrasive bonding as applied to ceramics will be introduced as an option method of joining.
Prerequisites: 7811. Lab fee charged.

7830 Gas Tungsten Arc Welding **4-2-4**
Introduction and practical application of Gas Tungsten Arc Welding - elementary skills are practiced to familiarize the student. However, the technical aspects of process application are the major thrust of the course.
Prerequisites: 7810. Lab fee charged.

7831 Fabrication Processes & Techniques II **3-3-3**
An advanced course covering various fabrication operations whereby strength consideration as well as joining methods in areas of metals and plastics will be introduced. Stamping and forming as it pertains to materials will be introduced.
Prerequisites: 7821, 7111. Lab fee charged.

7840 Special Welding Processes & Applications **4-2-4**
(Not a skill practice course) Persons with training and knowledge in some areas of welding operations who wish to progress toward the technical levels of welding may find this course helpful. The main focus of the course is to study the more scientific and technical aspects of several welding processes so that the student will be able to specify how improvements may be made in various industrial applications.
Prerequisites: 7820. No lab fee charged.

7910 Surveying Measurements **2-4-3**
Introductory course in field measurement techniques, with emphasis on units of measurement, field note format, instrument usage, differential leveling, 3-wire leveling, profiles, cross sections, taping, E.D.M. usage, horizontal and vertical angles, bearings and azimuths.
Corequisites: 1191. No lab fee charged.

7911 Construction Methods **3-1-3**
Introduces the student to the various methods of construction. To include excavation and equipment foundation systems, and forming, floor-wall-roof framing systems. To also include the principles of reinforced concrete and methods of strucutral steel design.
Prerequisites: None. No lab fee charged.

7920 Surveying Calculations **4-2-3**
Intermediate course in surveying calculations, with emphasis on traverse closures and adjustments, coordinate calculations, area determination by D.M.D. and coordinates, coordinate geometry, direct and inverse routines, stadia measurements, triangulation, slope staking, pipe layout, analysis of errors. "COGO" Computer Program.
Prerequisites: 7910. No lab fee charged.

7930 Route Surveying **3-3-3**
Advanced course in the elements of route surveying, with emphasis on design and layout of horizontal curves, vertical curves, and spiral transition curves, calculation of super-elevation, use of the state plane coordinate system, with emphasis on Ohio, Kentucky, and Indiana.
Prerequisites: 7920, 7032. No lab fee charged.

7931 Light Construction **3-3-3**
Forest products and their characteristics, carpentry, roofing, etc.; footings; foundations; bracing; retaining walls; construction material and methods; lightweight steel construction.
Prerequisites: 1192. No lab fee charged.

7934 Statics (Civil) **3-2-3**
A continuation and application of principles of Physics to engineering analysis. Topics of instruction include force analysis of friction and hydrostatic pressure, and an introduction into the relation between stress and strain.
Prerequisites: 1192, 2292. No lab fee charged.

7940 Elements of Land Surveying **3-2-3**
Advanced course in the elements of boundary surveys, with emphasis on document research, deed descriptions, U.S. public lands survey system, Ohio land subdivisions, legal aspects of land surveys.
Prerequisites: 7920. Lab fee charged.

7941 Heavy Construction **3-2-3**
Designed to give the student a thorough knowledge and understanding of the design principles and construction techniques involved with those buildings constructed with heavy timber, steel, concrete or a combination of these materials. The emphasis of this course is concerned with commercial and industrial buildings, including multi-level structural installations, piles, cassions, and retaining walls. Also the student should have a thorough working knowledge of building materials and construction techniques.
Prerequisites: None. Corequisites: 7945. Lab fee charged.

7943 Estimation and Inspection **3-2-3**
It is a technical course that have been designed to give the student an understanding of bidding procedures, quantity take off of materials and their relationship to the construction contracts. Description of materials and how different materials affect the bid. Study of installation procedure and how they affect the bid. Study and analysis of the unit of measurement of work. Estimation of the quantity of materials needed to finalize construction project.
Prerequisites: 1191. No lab fee charged.

7944 Strength of Materials (Civil) **3-2-3**
An introductory course in the application of engineering mechanics to analysis of Civil Engineering structures. Topics of instruction include analysis of connections, membrance stresses and beams. The concepts of centroids and moment of inertia are applied to design problems.
Prerequisites: 7934. No lab fee charged.

7945 Structural Design I **3-2-3**
A design course in which the principles of engineering mechanics are applied to design of simple structures. Topics of instruction include space frames, beam analysis and columns.
Prerequisites: 7934. Lab fee charged.

7947 Drainage Control Systems **3-2-3**
An introductory course in the design of drainage conduits for removal of storm runoff. Analysis of hydrologic problems by the rational method. Study of open channel hydraulics with application to highway drainage channels, median swales, culverts and gutters. Introductions to pipe network problems.
Prerequisites: None. No lab fee charged.

7948 Site Development **3-2-3**
Analysis of the elements in site development, including subdivision and zoning regulations; construction of streets, gutters, water and sewerage systems and earthwork.
Prerequisites: 1192. No lab fee charged.

7950 Surveying Field Project **1-6-3**
Specialized project utilizing fundamental theories and standard practices involved in surveying. To include courthouse research, field reconnaissance and measurements, resolution, platting and astronomic observations.
Prerequisites: 7930, 7940. No lab fee charged.

7952 Contracts and Specifications **3-0-3**
Common usage and practice in law and preparation of contracts and specifications for housing, building construction and engineering services. Examples of actual contracts and specifications relative to A.I.A. and CSI formats.
Prerequisites: None. No lab fee charged.

7953 Construction Management and Operation **3-2-3**
An analysis of a contractor's operation from the initial purchase of land to the completion of a project. Contractor's relationship with the architect, engineer, client, and public agencies. Planning coordination, progress charts, and subcontracts are emphasized.
Prerequisites: None. No lab fee charged.

7954 Structural Design II **2-4-3**
A design course in which the principles of engineering mechanics are applied to reinforced concrete structures. Topics of instruction include the ultimate strength concept of design, and an introduction to indeterminate frame analysis.
Prerequisites: 7944, 7945. No lab fee charged.

7955 Soils Engineering **2-3-3**
An introductory course in soils and foundation engineering. Topics of instruction include soil classification, routine soil testing, slope stability, optimum compaction and footing design.
Prerequisites: 7934. Lab fee charged.

7957 Potable & Wastewater Treatment **3-1-3**
An introductory course in state of the art water treatment processes. Examination of treatment methods for control of water borne disease. Study of process alternatives in primary, secondary and advanced wastewater treatment. Care studies of industrial wastewater problems. Design alternatives for low flow wastewater treatment.
Prerequisites: 7947. No lab fee charged.

7980 Building and Support Codes **3-0-3**
Background material on which codes are founded and their legal basis. Testing procedures and evaluating laboratory analysis of construction materials are stressed. Emphasizes Building Code and Standards, Mechanical Code, Plumbing Code, Housing Code, and National Electrical Code. General introduction to usage and development of Building Code and supporting codes.
Prerequisites: None. No lab fee charged.

7981 Plan Reading and Review **3-0-3**
Basic course in the reading of construction working drawings. Emphasis is placed on symbols used in the production of achritectural, mechanical, and electrical drawings. Course includes interpretation of drawing details, sections, elevations, floor plans. Includes instruction on how to conduct nonstructural plan review of simple structures prior to issuance of permits.
Prerequisites: 7980. No lab fee charged.

7982 Fire and Life Safety **3-0-3**
A fundamental course designed to give the student a basic understanding of the provisions of the Building Code which relates to fire and life safety, such as exits, fire-resistive construction, sprinkler systems, alarm systems, occupancy separations, fire assemblies, etc.
Prerequisites: None. No lab fee charged.

7983 Techniques of Inspection & Public Relations 3-0-3
An introductory course in building inspection with special reference to construction in the field as it relates to minimum standards and legal aspects of enforcement of building laws. Typical daily problems of field inspection are examined and evaluated in accordance with the appropriate building regulation. Includes elements of basic report writing for inspectors. Public relations as it relates to building inspection activities is emphasized.
Prerequisites: None. No lab fee charged.

7984 Engineering for Building Inspectors 3-0-3
Simple engineering for field inspection, using applied algebra as a mathematical tool. Forces and simple stresses are examined and how they apply to less complex structural systems in light construction.
Prerequisites: 1171 or 1191. No lab fee charged.

7985 Structural Inspection of Concrete 3-0-3
This course is designed to provide technical knowledge and background information to those inspectors seeking registration as City and County approved inspectors. Included in the course are reviews of basic inspector responsibilities and information in the field of aggregate production, batch plant operation, cement and admixtures, hauling and placing concrete, and quality control and testing procedures.
Prerequisites: 7980. No lab fee charged.

7986 Structural Inspection of Wood 3-0-3
An introductory course in building inspection of wood structures covering simple wood framing, the requirements of the Building Code, as well as some wood frame design such as beams and shear diaphragms.
Prerequisites: 7980. No lab fee charged.

7999 Special Problems Seminar - Civil Engineering Var-Var-Var
Individual and independent and special projects pertaining to Civil Engineering Technology. Open to fourth and fifth term students, by special arrangement with Academic Advisor and the Dean.
Prerequisites: None. No lab fee charged.

8100 Aircraft Orientation and Basic Aerodynamics 3-2-3
Learn to perform ground engine run-up and flight control movement check and taxi procedure. Learn by aircraft physical laws and perform numerical computations. Lift, thrust and drag. Stability of aircraft. Effects of balance.
Prerequisites: None. No lab fee charged.

8101 Welding Processes 1-4-2
To include soldering, brazing and gas arc-welding steel. Fabrication of tubular structures, soldering of stainless steel, welding stainless steel and aluminums, magnesium and titanium. Inspect and check welds.
Prerequisites: None. Lab fee charged.

8102 Machine and Hand Tools 1-4-3
Identify and select aircraft hardware and materials. Fabricate and install rigid and flexible fluid lines and fitting.
Prerequisites: None. Lab fee charged.

8103 FAA Regulations 3-2-3
Complete required maintenance forms, records and inspection report. Selection and use FAA and manufacturer's aircraft maintenance specifications, data sheets, manuals, publications and related Federal Aviation Regulations.
Prerequisites: None. No lab fee charged.

8110 Aircraft Fuels and Fuel Systems 1-4-2
Inspect, check and repair pressure fueling, transfer, defueling, and fuel dump systems. Repair of fuel systems components. Inspect, check, service, troubleshoot, and repair aircraft fuel systems. Inspect, check, service, troubleshoot, and repair powerplant fuel systems.
Prerequisites: 8102. No lab fee charged.

8120 Airframe Structure 5-5-5
Identifying of wood defects, inspect wood structures, service and repair wood structures, fabric and fiberglass covering materials. Trim, lettering and touch-up paint; cleaning and corrosion controls, inspect and identify defects.
Prerequisites: 8100. No lab fee charged.

8121 Airframe Hydraulic and Pneumatic Systems 1-4-2
Repair hydraulic and pneumatic power system components. Inspect, check, service, troubleshoot and repair hydraulic and pneumatic power systems.
Prerequisites: 8102. No lab fee charged.

8122 Materials and Processes 2-3-3
Identify and select aircraft hardware and materials. Perform precision measurements. Perform penetrate, chemical etching, and magnetic particle inspections. Identify and select appropriate nondestructive testing methods. Perform basic heat-treating processes. Inspect and check welds.
Prerequisites: 8102. Lab fee charged.

8130 Airframe Systems, Hydraulic & Pneumatic Landing Gears 3-7-5
Inspect, check, service and repair landing gear. Retraction systems, shockstruts, brakes, wheels, tires and steering systems. Inspect, check and service of warning systems of anti-skid electrical brakes. Controls, landing gear position indicating and warning systems.
Prerequisites: 8121. No lab fee charged.

8131 Airframe Structures, Sheet Metal 3-7-4
Install special rivets and fasteners. Inspect bonded structures. Inspect and repair plastics, honeycomb and laminated structures. Inspect and repair sheet metal structures. Hand form, layout, bends sheet metal and install conventional rivets. Flush riveting. N.A.G.A. riveting, high-shear rivets, cherry lock rivets.
Prerequisites: 8103. Corequisites: 7009. Lab fee charged.

8140 Aircraft Electrical Systems 5-5-5
Repair aircraft electrical system components. Install, check and service airframe electrical wiring, controls, switches, indicators, and protective devices. Inspect, check, trouble-shoot, service, and repair alternating current and direct current electrical systems. Service compound and shunt generators, alternators, starters, and starter-generators. Check and adjust generating output regulation. Repair and/or replace fuses, circuit-breaker, switches, high and low tension wiring, terminals and terminal blocks, magnetic switches and transformers.
Prerequisites: 8131. No lab fee charged.

8141 Aircraft Instrument, Communication and Navigation, and Utility Systems 5-5-5
Installation, marking, swinging of instruments. Testing of pilot and static air systems and filter systems. Install and check pressure, vacuum, mechanical instruments. Inspect, check, and service auto-pilot, approach control and communication and navigation systems. Inspect and repair antenna and electronic equipment. Inspect, check and service speed and take-off warning system electrical brake controls, anti-skid system and carbon monoxide detection systems. Inspect, check and service ice and rain control system. Inspect, check, troubleshoot, service and repair landing gear position and warning system and aircraft fire detection and extinguishing systems.
Prerequisites: 8120. No lab fee charged.

8142 Flightline Maintenance I 1-4-2
Identify and select cleaning materials, perform cleaning and corrosion control, protect battery compartment. Move aircraft employing hand signals and tie down aircraft. Perform airframe and powerplant conformity and airworthiness inspection.
Prerequisites: 8110, 8121. No lab fee charged.

8150 Aircraft Electrical Generating Systems 3-2-3
Direct current and alternating current generation. Study of theory of operation disassembly, overhaul and installation. Adjustment of regulators and troubleshooting the system.
Prerequisites: 8110, 8131. No lab fee charged.

8151 Airframe Assembly & Rigging 3-7-5
Rig fixed-wing aircraft. Rig rotary-wing aircraft. Assemble, balance and rig aircraft and control surface. Using inspection forms, perform a 100 hour inspection. Perform check of aircraft pertaining to specifications and A.D. note compliance. Make repairs and adjustments found to be necessary during inspection. Check and perform weight and balance of aircraft.
Prerequisites: 8131. Lab fee charged.

8152 Flightline Maintenance II 2-3-3
Identify and select cleaning materials, perform cleaning and corrosion control. Perform powerplant conformity and airworthiness inspection.
Prerequisites: 8142. No lab fee charged.

8160 Powerplant Theory, Reciprocating 5-5-5
Introduction to the design, manufacture, overhaul and repair of piston and engines and their installation. Overhaul of an opposed

engine. Inspect and repair a 14-cylinder or larger radial piston engine.
Prerequisites: 8122. Lab fee charged.

8161 Powerplant Lubrication **3-2-3**
Identify and select proper lubricants. Inspect, check, service, trouble-shoot and repair powerplants lubrication systems.
Prerequisites: None. Corequisites: 8160. No lab fee charged.

8162 Propellers **3-2-3**
Inspect, check, service and repair propeller synchronizing and ice control systems. Identify and select propeller lubricants. Balance propellers. Repair propeller control system components. Inspect, check, service and repair fixed pitch constant speed and feathering propellers and propeller governing systems. Install, trouble-shoot, and repair engine exhaust systems.
Prerequisites: 8100, 8103. No lab fee charged.

8170 Powerplant Theory, Turbine **5-5-5**
Introduction to the design, manufacture, overhaul and repair of turbine engines and their installation. Inspect, check, service, trouble-shoot and repair turbine engine installation, fuel control and ignition systems.
Prerequisites: 8160. No lab fee charged.

8171 Fuel Metering Systems **3-2-3**
Inspect, check, service, trouble-shoot and repair reciprocating fuel injection systems.
Prerequisites: None. No lab fee charged.

8172 Ignition Systems **5-5-5**
Overhaul magneto and ignition harness. Repair engine ignition system components. Inspect, check, service, trouble-shoot and repair powerplant ignition systems.
Prerequisites: 8160. Lab fee charged.

8180 Turbine Powerplant Systems Components **6-4-6**
Introduction to the design, function, repair and servicing of turbine fuel controllers. Practice of installation of control units and trimming of turbine fuel control units. Practice of adjustment of idle speed, and use of charts to turbine air inlet and exhaust systems.
Prerequisites: 8170. No lab fee charged.

8181 Powerplant Carburetor Fuel System **6-4-6**
Inspect, check and service water injection systems. Overhaul a carburetor. Repair fuel metering components. Inspect, check, service, trouble-shoot and repair reciprocating carburetor systems and induction manifolds. Repair engine cooling system components. Inspect, check, trouble-shoot, service and repair engine cooling system.
Prerequisites: 8171. No lab fee charged.

8182 Airframe and Powerplant Comprehensive **3-2-3**
A comprehensive study and review of all the required subjects and subject material preparing the student for the Comprehensive Examination; demonstrating the proficiency required to be awarded the degree and be named a candidate for the Federal Aviation Agency Maintenance Technician License.
Prerequisites: None. No lab fee charged.

9000 Career Development **2-0-2**
A small group, self development, approach to career choice and development. This course will help the student to gain better self-understanding through the exploration of personal interests and aptitudes as they relate to career demands. The student will acquire skills in communications, establishing career goals and making decisions. Emphasis on job seeking techniques, the job application, the resume, the interview. Activities will include testing, group interaction exercises, guest lectures, and review of pertinent literature.
Prerequisites: None. Lab fee charged.

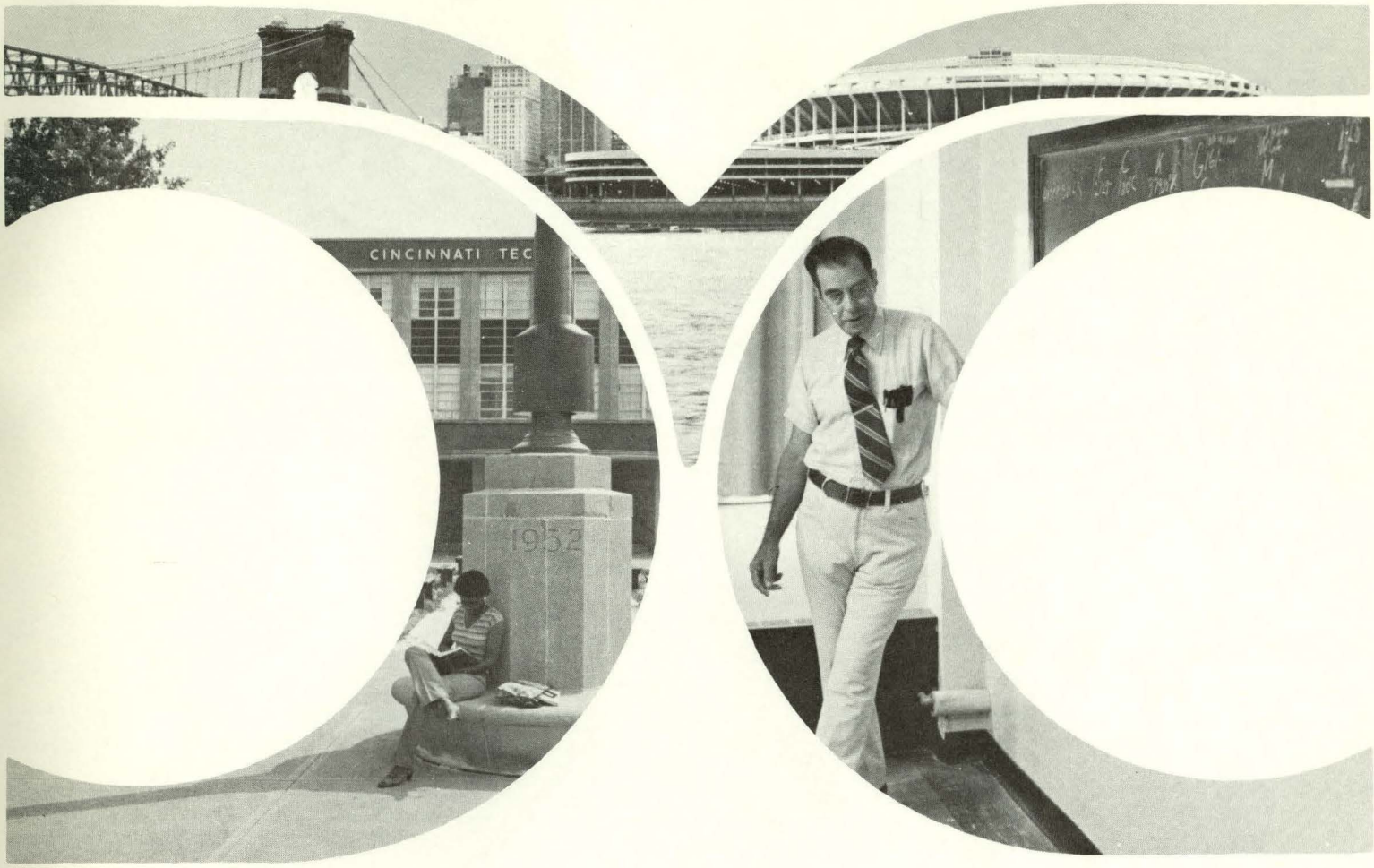
9201, 9202, 9203, 9204, 9205 Cooperative Employment
2-3 Credit Hours Each Term
Usually on an alternating term basis, the Business student is placed on a full-time (32-40 hour) job that ideally relates to his or her class work. This affords the student the opportunity to make practical application of the knowledge and skills acquired in his or her class work. With each succeeding co-op term, the student ideally is able to assume more responsibility and perform higher level duties on the job because of what he or she has learned from the previous term(s) of employment and the added knowledge and skills acquired in each school term. Participation in a cooperative employment seminar and related instructional assignments equivalent to thirty (30) to forty (40) class hours per term is required to earn co-op credit.
Prerequisites: None. No lab fee charged.

9301, 9302, 9304, 9304, 9305 Cooperative Employment
2-3 Credit Hours
Usually on an alternating term basis, the Health Technologies student is placed on a full-time (32-40 hour) job that ideally relates to his or her class work. This affords the student the opportunity to make practical application of the knowledge and skills acquired in his or her class work. With each succeeding co-op term, the student ideally is able to assume more responsibility and perform higher level duties on the job because of what he or she has learned from the previous term(s) of employment and the added knowledge and skills acquired in each school term. Participation in a cooperative employment seminar and related instructional assignments equivalent to five to ten class hours per term is required to earn co-op credit.
Prerequisites: None. No lab fee charged.

9311, 9312, 9313, 9314, 9315 Clinical Cooperative Education
2-3 Credit Hours
The Health Technologies student is placed in a clinical experience that relates to his or her program. This affords the student the opportunity to make practical application of the knowledge and skills acquired in the didactic phase of the program. With each succeeding clinical cooperative education term the student is able to assume more responsibility and perform higher level duties in the clinical experience because of what he or she has learned from the previous term(s) of experience and the added knowledge and skills acquired in each college term. In order to have credit toward programs, students, upon completion of the course, must successfully complete a proficiency examination or must document having met the course requirements related to each technology area. Participation in a clinical cooperative education seminar and related instructional assignments equivalent to five to ten class hours per term is required to earn co-op credit.
Prerequisites: None. No lab fee charged.

9401, 9402, 9403, 9404, 9405 Cooperative Employment
2-3 Credit Hours
Usually on an alternating term basis, the Engineering student is placed on a full-time (32-40 hour) job that ideally relates to his or her class work. This affords the student the opportunity to make practical application of the knowledge and skills acquired in his or her class work. With each succeeding co-op term, the student ideally is able to assume more responsibility and perform higher level duties on the job because of what he or she has learned from the previous term(s) of employment and the added knowledge and skills acquired in each school term. Participation in a cooperative employment seminar and related instructional assignments equivalent to five to ten class hours per term is required to earn co-op credit.
Prerequisites: None. No lab fee charged.

9501, 9502, 9503, 9504 Cooperative Employment
2-3 Credit Hours
Usually on an alternating term basis, the Ornamental Horticulture student is placed on a full-time (32-40 hour) job that ideally relates to his or her class work. This affords the student the opportunity to make practical application of the knowledge and skills acquired in his or her class work. With each succeeding co-op term the student ideally is able to assume more responsibility and perform higher level duties on the job because of what he or she has learned from the previous term(s) of employment and the added knowledge and skills acquired in each school term. Participation in a cooperative employment seminar and related instructional assignments equivalent to thirty (30) to forty (40) class hours per term is required to earn co-op credit.
Prerequisites: None. No lab fee charged.



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B.S., Thomas More College
M.Ed., Xavier University

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A.A.S., Ohio College of Applied Science
Teresa S. Van DeRyt ..... Executive Assistant, Business Technologies Division
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A. Wayne Vaughn .. Vice President, Finance & Business Affairs
B.S., Miami University
B.A., Miami University
Karl N. von Kampen ..... Coordinator, Business Technologies Division
B.S., Bradley University
M.S., Bradley University
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B.A., University of Cincinnati
M.A., University of Cincinnati
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M.Ed., University of Cincinnati
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A.B., Lindenwood College
Gary Walton ..... Director, Publishing Operations
A.A.B., Cincinnati Technical College
B.S., University of Cincinnati
Charles E. Warman ..... Senior Vice President Emeritus
B.Ed., University of Cincinnati
M.Ed., Xavier University

Sharon K. Waters ..... Clerical Assistant, Finance & Business Affairs
Olivia Watts, R.N. ..... Coordinator, Health Technologies Division
B.S.N., University of Cincinnati
Jerome T. Weber ..... Instructor, Physical Science/ Mathematics Division
B.S., Ohio University
Gary M. Webster ..... Coordinator, Engineering Technologies Division
B.S.E.E., Ohio State University
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B.B.A., University of Cincinnati
M.B.A., Indiana University
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A.B., Miami University
M.A., Miami University
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B.S., University of Cincinnati
R.D., Veterans Administration Center, Los Angeles
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E.E., University of Cincinnati
Ann Wolf, R.D. ..... Adjunct Clinical Instructor, Dietetics Program Nutrition Consultant
R.D., Michael Ries Hospital
Mark Wolter ..... Groundskeeper, Plant Operations
A.A.B., Cincinnati Technical College
Judith A. Wright ..... Clerical Assistant, Developmental Education
A.A.B., Cincinnati Technical College
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R.N., Mt. Sinai School of Nursing
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M.A., Indiana University
M.Ph., Yale University
Lawrence J. Ziegler ..... Instructor, Communication Skills/ Social Sciences Division
B.A., Mount St. Mary Seminary
B.S., Mount St. Mary Seminary
M.Ed., Xavier University

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William Needham ..... Perfection Heating Corporation
Clifford Rybolt ..... Rybolt Heating Company

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Dennis Wolter ..... Aircraft Paint & Upholstery
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Paul Horgan ..... Hewlett-Packard
James Magrish ..... U.C. Medical Center
Bill Marshall ..... St. Francis Hospital
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John Ross ..... St. Luke's Hospital
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Bill Minielli, Jr. ..... Minielli Construction Company
Dale Schneider ..... H. C. Nutting Company
David Swedes ..... Hummel Building Company
Jack White ..... KZF & Associates

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Ralph Leibing ..... Hamilton County
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Jim Viox ..... Viox & Viox
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Terry Wheat ..... Wheat & Associates

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Lee Ransick ..... Ohio National Life Insurance Company
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Lois Van Winke ..... Ft. Hamilton Hughes Hospital
James Windsor ..... ADP

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Amelia Harris ..... CTC Graduate
Dr. Anita Howe ..... Cincinnati Health Department
Carol Manser ..... St. Francis/St. George Hospital
Mary Helen Palmer ..... University of Cincinnati
Deborah Peters ..... CTC Graduate
Joe Piepmeyer ..... U.C. College of Medicine
Melda Schmidt ..... Edgecliff College
Ann Wolf ..... Consultant Dietitian

Electrical Power Engineering Technology

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Dick Dooley ..... Pedco
Richard Doppes ..... High Voltage Maintenance
Tony Eckstein ..... Cincinnati Gas & Electric Company
Lee Grosser ..... Grosser & Associates
Noal Hale ..... Procter & Gamble
Cal Imboden ..... Sylvania
Urban Knue ..... Frank's Electric
Howard Mayers ..... Mayers Electric
Ron Schapp ..... Bussman Manufacturing
Charles Shrive ..... S.R.A. Engineering Group
Roy Waldo ..... Bosch & Latour

Electro-Mechanical Engineering Technology

Tom Allen ..... Cincinnati Milacron
Troy Fultz ..... Cincinnati Milacron
Greg Goetz ..... Cincinnati Milacron
James W. Heywood ... Structural Dynamics Research Corporatio

John Howison .....
James T. Mettey ..... Cincinnati Electronics
Kevin O. Miller ..... CTC Student
Jerry Osterbrock ..... Cincinnati Milacron
William R. Zimmerman ..... Siemens-Allis, Inc.

Electronics Engineering Technology

Bruce Corso ..... Reams Controls, Inc.
Vern Dahl ..... Cincinnati Electro-Systems
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Rick Pottenger ..... Lodge & Shipley Company
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Dave Russert ..... Cincinnati Word Processing
Bill Stross ..... Metcut Research Associates, Inc.
Dick Vance ..... Nutone Division of Scovill Mfg.
Dan Wright ..... Cincinnati Word Processing

Graphic Communications Technology

Mel Brower ..... Melbro Color Service
Edgar Kobman ..... Gibson Greeting Card Company
Ron Schlensker ..... Typeco
Hal Sterne ..... S. Rosenthal Company
James Wermes ..... Gibson Greeting Card Company
Robert Zsachau ..... S. Rosenthal Company

Hazardous Waste Management Technology

Richard A. Carnes ..... U.S. EPA (MERL)
Craig R. Doolittle ..... Merrell National Labs
David P. Foulkes ..... Sun Chemical Corp.
I. A. Hoekstra ..... CER/CECOS
Daniel McCabe ..... Environmental Enterprises, Inc.
Harold McKenzie ..... Chemed Corpration
Ernest Neal ..... Ohio EPA
Steven A. Raye ..... United Container Corp.
Martin S. Seltzer ..... Porter, Wright, Morris & Arthur
Wayne Smith ..... MCB Reagents
David R. Streng ..... Environmental Enterprises, Inc.
Edwin E. Thompson ..... McGill & Smith
Richard Toftner ..... Rota Management, Inc.
W. Gregory Vogt ..... SCS Engineers
Bob Weidner ..... National Lead of Ohio

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Mary Daniel ..... Self-Employed
Bill Eilers ..... Kings Island Inn
Harry Foster ..... Town & Country
Domenico Germano ..... Quality Inn Riverview
Earl Hatt ..... Quality Inn Riverview
Dorothy Larsson ..... Cincinnati Milacron
Luigi J. LaValle ..... Dockside VI
William Porter ..... Playboy Club
Paul Scherra ..... Cincinnati Country Club
George Sunderhaus ..... Federated Department Stores
Thomas Trimpe ..... IGA-English Woods Market
Roy Wash ..... Cincinnati Gas & Electric Company
Kenneth Webber ..... Cincinnati Gas & Electric Company

Industrial Engineering Technology

Fred Brinkmiller ..... Siemens-Allis Corp.
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Walter Conner ..... Cincinnati Gilbert Machine Tool Co.
William Ensminger ..... Ceemco, Inc.
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Roger Kelly ..... U.S. Shoe Corp.
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David Miller ..... Lodge & Shipley Co.
Douglas Parham ..... Senco Products, Inc.
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Mike Heglin ..... Raytheon Lasers Center
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Loss Control Technology

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Jack Collins ..... Hamilton County Court House
Ronald Cottrell ..... Fifth/Third Bank
Ronald Heineman ..... Frisch's Inc.
Michael Hernandez ..... Allied Security
Donald Huesman ..... Cincinnati Milacron
William Mantz ..... Armco Steel Corporation
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Henry Sandman ..... University of Cincinnati
Cpt. Ed Schneuer ..... Cincinnati Fire Department
James Stauder ..... Armco Steel Corporation
Michael Theisen ..... Children's Hospital Medical Center
Daniel Wolfangle ..... Hamilton County Sheriff's Office

Manufacturing Engineering Technology

Bill Broadwell ..... Heekin Can Company
Bob Clark ..... Young & Bertke Company
John Forg ..... Ilsco Corporation
Frank Gorsler ..... General Electric Company
Paul Green ..... Dover Corp.-O.P.W. Division
Harold Kiewert .....
Joe Meyer ..... Lodge & Shipley Co.
Tom Moon ..... Cincinnati Milacron
Jim Van De Ryt ..... General Electric Company
Fred Wilking ..... Dover Corp.-O.P.W. Division

Manufacturing Engineering Technology - Fabrication Option

C. Melvin Adams ..... University of Cincinnati
Maurice Bolinger, Jr. ..... Gladstone Labs
Robert Brown ..... Hobart
Larry V. Kent ..... Kent Welding Service
Jaquelyn Kovach ..... General Electric Company
Larry W. Mecklenborg ..... G. E. Schmidt Company
Calvin Moulder ..... Melben Products
James E. O'Brien ..... Emery Industries
Kenneth R. Rouff ..... Great Oaks Joint Vocational Schools
John F. Rudy ..... General Electric Company

Manufacturing Engineering Technology - Plastics Option

Fritz Backscheider ..... Recto Molded Products
Harold Colwell ..... Precision Lens
Bob Polewski ..... Engrave, Inc.
Dan Thomas ..... Hamilton Plastic Corporation

Measurement & Testing Technology

Bob Aylesworth .....
Bruce Beimesch ..... Emery Industries, Inc.
Bob Bradt ..... Sun Chemical Company
Walter Firth ..... Stress Analysis, Inc.
Bob Glodowski .....
Charles Haynes ..... General Electric Company
Lawrence J. Kamphake ..... U.S. EPA (MERL)
Stephen Lank ..... Procter & Gamble
Walter Strohm ..... Monsanto Corporation

Mechanical Design Technology

Jim Balcom ..... Little Design Company
Art Baldock ..... Xtek, Inc.
V. Bidlingmeyer ..... Young & Bertke Company
Phil Cappel ..... Bishopric Products Company
Greg Hauck ..... Little Design Company
Werner Jessen ..... Alexander and Associates
Marvin Jester ..... Kintech Services, Inc.
Mason Keen ..... Senco Products Inc.
Dr. Richard Kegg ..... Cincinnati Milacron
Don Mathias ..... Lukenheimer Company
Paul Neumeier ..... Access Corp.
Carl Steele ..... Xomox Corp.

Medical Assisting Technology

Richard Jubelirer, M.D. .....

James Kegler, M.D. .....
Tina Kyrios, M.A. ..... Mayfield Neurological Institute
E. Theresa Miller, R.N. ..... Group Health Associates
Lee Moeller, R.N. ..... Group Health Associates
Donna Percy, M.A. ..... Group Health Associates
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Lee Anne Powers, M.A. .....
Alan Schulman ..... Attorney
Sandy Sharfe, M.A. .....
Isadore Sharon, M.D. .....
Newell Skinner, M.A. .....
Sheila Stuckey, M.A. ..... Mayfield Neurological Institute
Pamela Toepfer, M.A. ..... Group Health Associates
Cynthia Wright, M.A. ..... Group Health Associates

Medical Laboratory Technology

Genevieve Alexander ..... Booth Memorial Hospital
Elaine Bolden ..... Veterans Administration Hospital
Lois Bonner ..... Shriners Burns Institute
Harold Cook ..... Cincinnati Health Department
Bradley Copeland, M.D. ..... Veterans Administration Hospital
Teresa Disher ..... Clermont County Hospital
Werner Donath, M.D. ..... St. Francis Hospital
Sharon Ficorilli ..... Deaconess Hospital
Paul Laemmle ..... Jewish Hospital
James Twitty ..... Dearborn County Hospital
Robert Uhl ..... St. Francis Hospital
Cathy Yoshikawa ..... Drake Memorial Hospital

Medical Record Technology

Evelyn Carter, RRA ..... Jewish Hospital
Ann Coomes, RRA ..... St. Elizabeth Medical Center
Frances Glaser, R.N. ..... Summit Nursing Home
Karen Hedrick ..... CTC Student
Joan Keefer, RRA ..... Cincinnati General Hospital
Jean Nickey, ART ..... Holmes Hospital
Martha Pape, RRA ..... Childrens Hospital Medical Center
Melanie Pariser, RRA ..... Ohio State University
Laura Saunders ..... Mt. Healthy High School

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Dick Allison ..... Allison Landscaping
Bob Bartel ..... Greater Cincinnati Airport
Robert Davis ..... Hamilton County Extension Service
Jack Herb ..... Jack Herb Florist
Bill Mattfeld ..... Mattfeld Gardens
Jerry Neidert ..... Neidert's Landscaping
Joseph T. Obermeyer ..... Natorp's
Thomas Smith ..... Spring Grove Cemetery
Earl Wilson ..... Thornton-Wilson, Inc.

Real Estate & Property Management Technologies

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Dave Coletta ..... Hague Realtors
Ann Franks ..... Robers Gold Key Realtors
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D. Michael Holbrook ..... Sibcy, Inc. Realtors
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Charles McLean .... Home Builders Association of Greater Cincinnati
Steve Oyler ..... Parchman & Oyler Realtors
Ron Packer ..... Century 21 Champions Real Estate
John Toelke ..... West Shell Realtors
Eunice Younkers ..... Theodore Mayer & Brothers Realtors

Respiratory Therapy Technology

Susan Allgier ..... Bethesda Hospital
Richard Beiting ..... Bethesda North Hospital
Edna Caywood ..... Health Careers Association of Greater Cincinnati
Kimball Dabe ..... Childrens Hospital Medical Center
David Dortin, Jr., M.D. ..... Jewish Hospital
Tonda Hoover ..... Jewish Hospital
Michael Moore ..... Cincinnati General Hospital
Robert Penman, M.D. ..... Bethesda Hospital
Steven Schreck ..... Christ Hospital
Edward Tinney ..... Jewish Hospital
Ann Tollner ..... Good Samaritan Hospital

Safety/Risk Management Technology

Dave Bertke ..... Cincinnati Milacron
Bruce Crutcher ..... Cincinnati Chamber of Commerce
Paul J. Schmid ..... Cincinnati Milacron
Bruce Snyder ..... Good Samaritan Hospital
Larry Wilson ..... Emery Industries

Sales Marketing & Industrial Sales Marketing Technologies

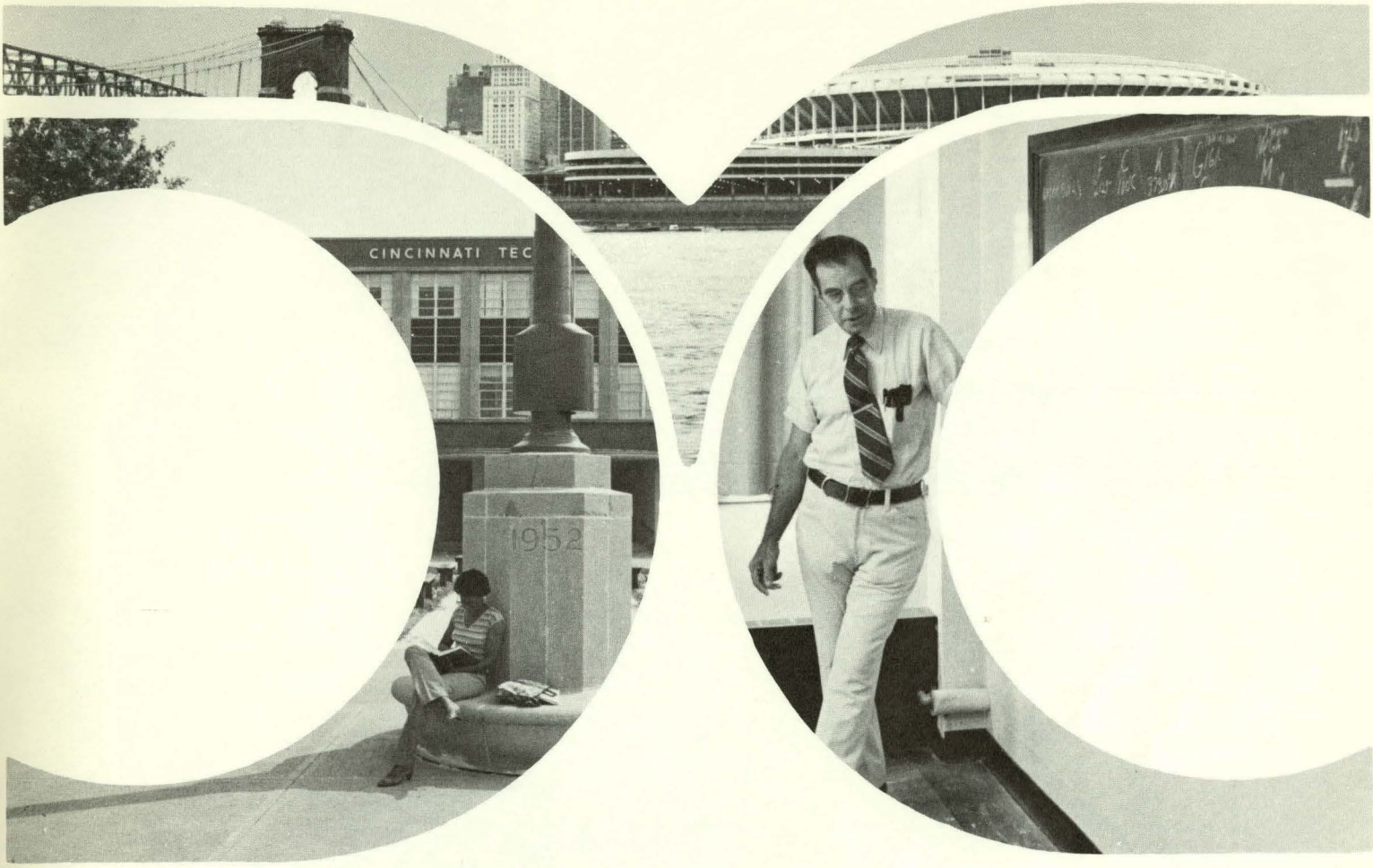
Joe Bauer ..... Swallens, Inc.
Mark Braunstein ..... Pogue's
Ralph Estes ..... Sales Marketing Executives Assn.
Bob Flannery ..... American Cyanamid
Bob Johnson ..... Kinney Shoes
Herbert P. Schaffer, Sr. ..... M & I Associates, Inc.
Ken Sheppard ..... Retired
Ruth Van Gorden ..... Merten Company
Steve Wolf ..... Keidel Supply

Secretarial Technologies

Richard Adams ..... South-Western Publishing Company
Elaine Jacobs ..... Fifth/Third Bank
William Knapp ..... Claus & Knapp Attorneys
Julia Pitts ..... Procter & Gamble
John Roth ..... City of Cincinnati
Edith Schnelle ..... Ohio Knife Company
Mary Unrine ..... Frost & Jacobs Attorneys
Rose Marie Valentine ..... General Electric Company

Surgical Technology

Lois Bruning, R.N. ..... St. Francis Hospital
Barbara Craig, R.N. ..... Providence Hospital
Lois Jones, R.N. ..... Mercy Hospital-North
Lois Karr, C.S.T. ..... A.A.S.T.
Theresa McClain, C.S.T. ..... CTC Graduate
Jude Norton, P.A. ..... Cincinnati Technical College
Kenneth Rowe, M.D. ..... U.C. Medical Center
C. James Sammarco, M.D. .....
Kimberly Shaw, R.N. ..... Deaconess Hospital
Jenny Siefferman, C.S.T. ..... CTC Graduate



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ACADEMIC CALENDAR
1981-1982

September Term (1981)

September 7	Labor Day — College closed
September 8	Classes begin
November 10	Classes end
November 11	Veterans Day — College closed
November 12, 13	No classes, offices open

November Term (1981)

November 16	Classes begin
November 26, 27	Thanksgiving Recess — College closed
Dec. 24 - Jan. 1	Winter Recess — No classes
December 24, 25	College closed
Dec. 31 - Jan. 1	College closed
January 4	Classes resume
January 22	Classes end

January Term (1982)

January 25	College closed (Martin Luther King Day observed)
January 26	Classes begin
February 15	Presidents Day — College closed
March 31	Classes end
April 1, 2	No classes, offices open

April Term (1982)

April 5	Classes begin
April 9	Good Friday — College closed
May 31	Memorial Day — College closed
June 9	Classes end
June 10-28	Summer Recess — No classes, offices open

June Term (1982)

June 29	Classes begin
July 5	College closed (Independence Day observed)
September 1	Classes end
September 2, 3	No classes, offices open

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Cincinnati, OH 45223
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