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CATALOG/HANDBOOK 82-83

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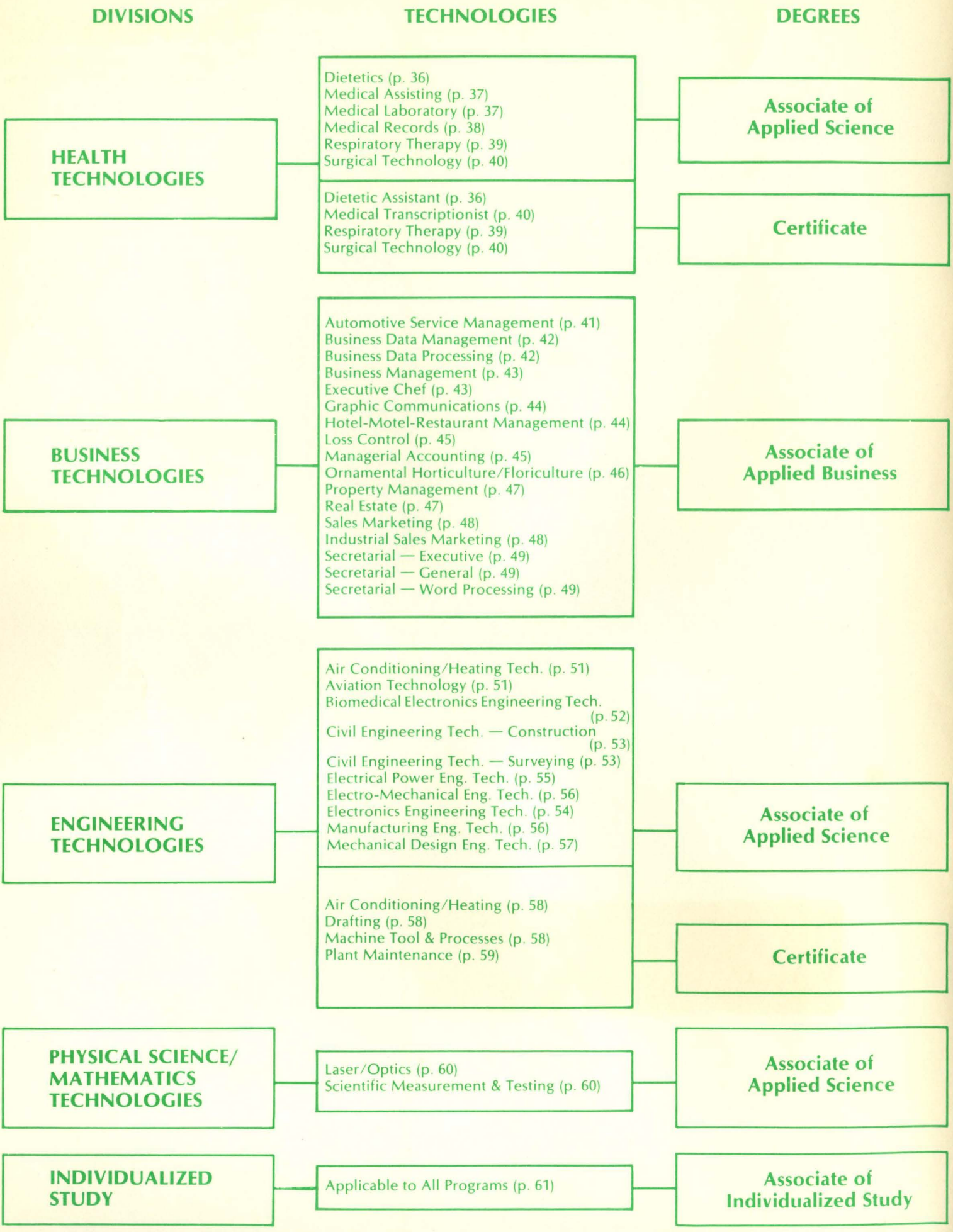
Cincinnati Technical College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1982-1983
Cincinnati Technical College
Catalog/Handbook

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All statements in this publication are announcements of present policy only and are subject to change at any time without prior notice. They are not to be regarded as offers to contract.

Cincinnati Technical College does not discriminate on the basis of race, age, color, handicap, national origin or sex in the admission of students or in any activity conducted by the Cincinnati Technical College.

Cincinnati Technical College is an equal opportunity institution.

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

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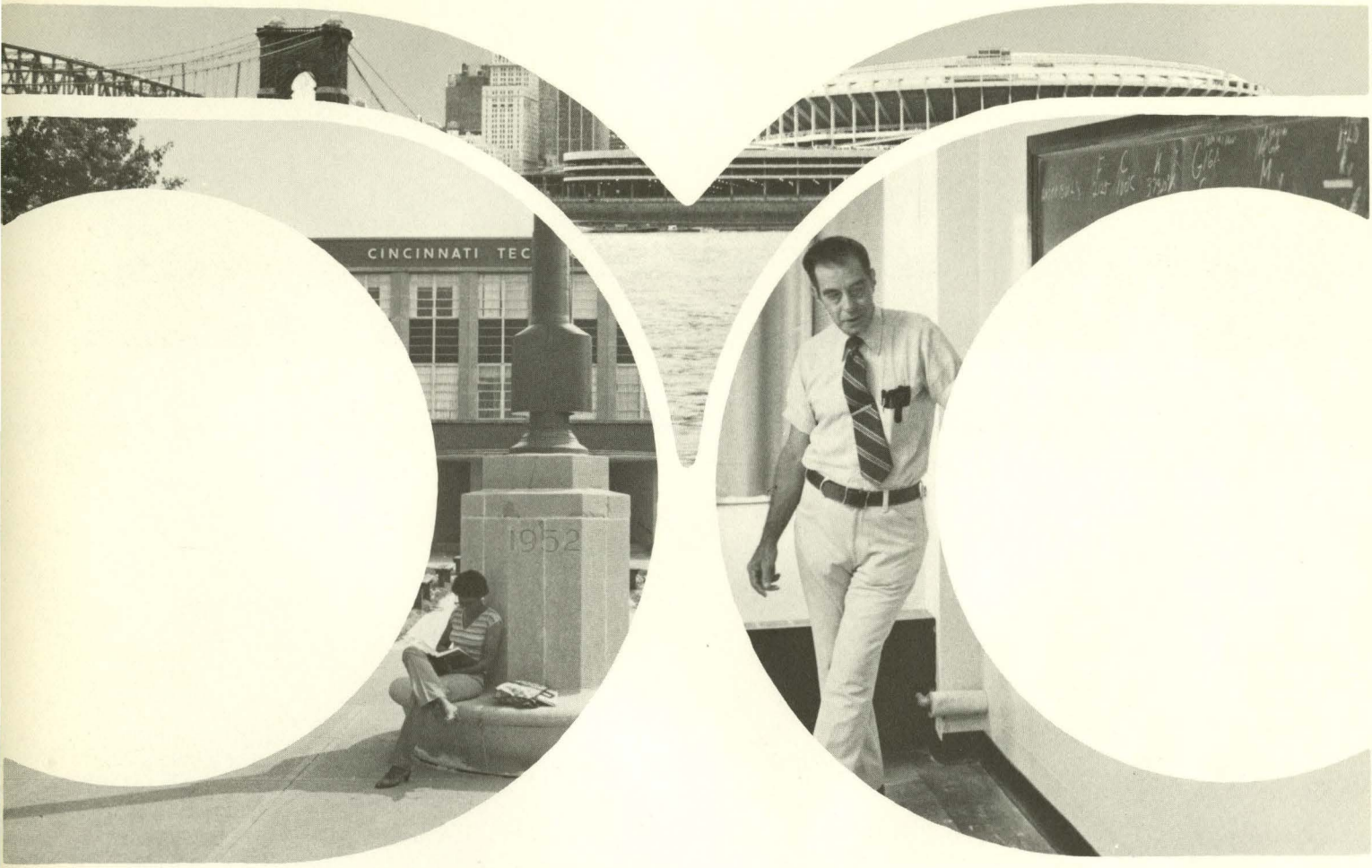

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DIRECTORY

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Office of the President
President ..... Frederick B. Schlimm
Institutional Development ..... Walter R. Murray
Development ..... Johnnie F. Boggio
Athletics & Activities ..... John E. Hurley
Public Information ..... Michele M. Imhoff
Publishing Operations Production ..... Gary Walton, Susie Evans
Affirmative Action, Human Resources & Staff Development ..... Eleanor Bonner
Executive Assistant ..... Davie Cooper
Planning & Research/Consortium ..... Terrence J. Glenn
Otto ..... Jo Seik

Office of Academic Affairs
Vice President ..... David C. Ballinger
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Extended Services (Evening) ..... Paul R. Callahan
Clerical Assistant ..... Linda Nagel
Learning Resource Center ..... James H. Horton
Reader Services ..... Thelma Barnes
Duane Gardner
Acquisitions ..... Marianne Cramer
Instructional Media ..... Dave Evans
Susan Madsen
Information Services ..... Debbie Tucker
Cataloging Services ..... Rose Von Volborth

Office of Finance & Business Affairs
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Financial Services ..... Carol Roth
Clerical Assistant ..... Sharon Waters
Receptionists ..... Evelyn Burke
Gloria Donaldson
Business Manager ..... Gene Wieland
Clerical Assistant ..... Elaine Biehl
Controller ..... Herb Bom
Accountants ..... Harry Bradley
Naomi Cain
Terry Taylor
Cashier ..... Linda Cole
Student Financial Aid
BEOG & OIG ..... Frank Barlag
Systems Analysis ..... Janice Lewis
College Work-Study ..... Lucille Richardson
Facilities ..... Dale McCarthy
Facilities Services ..... Leonard Bidwell

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Executive Assistant ..... Patricia Darling-Williams
Theresa Fleming
Treva Hanseman
Computer Systems, Programming & Operations .... Vicki Candella
Student Data Base ..... Kathleen Austing
Scheduling ..... Sue Erftenbeck
Analysis ..... Sandy Haddix
Operator ..... Joy Sunderman
Assistant Registrar ..... Carolyn Jones

Student Services
Dean ..... Ann I. Rasche
Clerical Assistant ..... Gaby Boeckermann
Counseling Services ..... John Wagner
Linda Meador
Carol Throckmorton
Veterans ..... Yolanda Lawrence
Assistant ..... Ann Ruoff
Educational Relations ..... Miriam Pizzuto

Business Technologies
Dean ..... Dan Cayse
Executive Assistant ..... Teri Sagel
Program Directors ..... Randall Corgan
Walter Wyatt
Automotive Service Mgmt. ..... Joe Keenan
David Kuehm
Karl vonKampen
Business Management ..... Jim Macke
Walter Wyatt
Data Management ..... Dave Lee
Debbie Coombs
Data Processing ..... Mike Nakoff
Verale Phillips
Executive Chef ..... Fred Hartzel
Graphic Communications ..... Al Leicht
Tom Miller
Gary Walton
Hotel-Motel-Restaurant Mgmt. ..... Rich Hendrix
Nancy Turner
Loss Control ..... Bea Stewart
Managerial Accounting ..... Joe Derickson
Ornamental Horticulture ..... Claire Ehrlinger
Brian Huffaker
Property Management & Real Estate ..... Vasil Ognenoff

Sales Marketing & Industrial Sales ..... Bob Elmer
Paul Kinzie
Secretarial ..... Connie Campbell
Joe Lower
Instructors ..... Stewart Bonem
Richard Brown
Annie Galloway
Clyde Kobberdahl
Katye Mindhardt
Lou Owsley
Len Penn
Lloyd Pitman
Rick Sefton
Swanya Smith

Engineering Technologies
Dean ..... Robert Craigo
Executive Assistant ..... Pat Robbins
Division Coordinators ..... Gary Graff
Charles Jonas
Ken Stoll
Air Conditioning ..... Clayton Van Camp
James Farrer
Aviation ..... Tony Rinck
Vince DeVol
Steve Bove
Biomedical Electronics Tech. ..... Michael Carroll
Bill Mullins
Civil Engineering Tech. ..... Paul DeNu
John Hubbard
Wally Klayer
Electrical Power Eng. Tech. ..... Tim Rush-Ossenbeck
Electro-Mechanical Eng. Tech. ..... Ray DiPilla
Gary Webster
Electronics Engineering Tech. ..... Roger Schaller
Rob Speckert
Manufacturing Eng. Tech. ..... Judd James
Hal Funk
Bill Rhein
Ralph Sanders
Mechanical Design Eng. Tech. ..... Terry Brown
Don Meyer
Instructors ..... Linda Hollstegge
Ken Steidley
LaVerne Winkle

Health Technologies
Dean ..... Dr. Gerry Kaminski
Executive Assistant ..... Claudia Straughn
Assistant Dean ..... Dr. Tom Kober
Dietetics ..... Eileen Coffe
Marianne Krismer
Medical Assisting ..... Nancy Walters
Olivia Watts
Medical Laboratory ..... Ed Knepp
Carolyn Laemmle
Medical Records ..... Rosemary Clark
Mary LaValle
Respiratory Therapy ..... Bob Eveslage
Pat Sanders
Surgical Technology ..... Martha Martin
Judith Meyer
Instructors ..... Ron Davidson
Jude Norton

Physical Sciences/Mathematics
Dean ..... Tom Stark
Laser/Optics ..... Dr. Prem Batra
Jerry Froehlich
Measurement & Testing ..... Ralph Schlueter
Instructors ..... Richard Bartlow
Frank Iacobucci
John Lally
Larry Pucke
Herman Randall
Rod Rupp
Bill Tulloss
Jerry Weber

Communication Skills/Behavioral Sciences
Instructors ..... Marc Baskind
Elmer Flamm
Marcus Green
Harry Heink
Mike Jones
Mary Lee Keller
Dan Mellinger
Tim Nolan
Catherine Wiesner
Kim Ziegel
Larry Ziegler

Developmental Education
Director ..... Elizabeth Hattemer
Clerical Assistant ..... Judy Wright
Counselor ..... Sharon Davis
Instructors ..... Grace Davis
Linda Knepp
Jim Marcotte
Kathleen Resnick
Jean Schmidt

GENERAL INFORMATION

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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.

The philosophy of Cincinnati Technical College is that technical education is best presented in a program which combines theoretical concepts, practical experiences and a broad spectrum of other valued educational experiences.

Technical Education

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. 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.

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.

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.

Cincinnati Technical College's "Co-opportunity" Plan

The Board 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 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.

The College is offering 37 associate degree programs and options and eight certificate programs in 1982-83. 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.

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.

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.

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.

In 1972 the name of the Institute was changed to Cincinnati Technical College, in accordance with state statute. On June 27, 1974, the phase out of the high school was completed and the College made the final payment to the Cincinnati Public Schools.

In its sixteen 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 4200 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 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

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
sales marketing
industrial sales marketing
secretarial

Engineering Technologies Division
electronics engineering technology
electro-mechanical engineering technology
electrical power technology
heating/air conditioning 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 and plant maintenance.

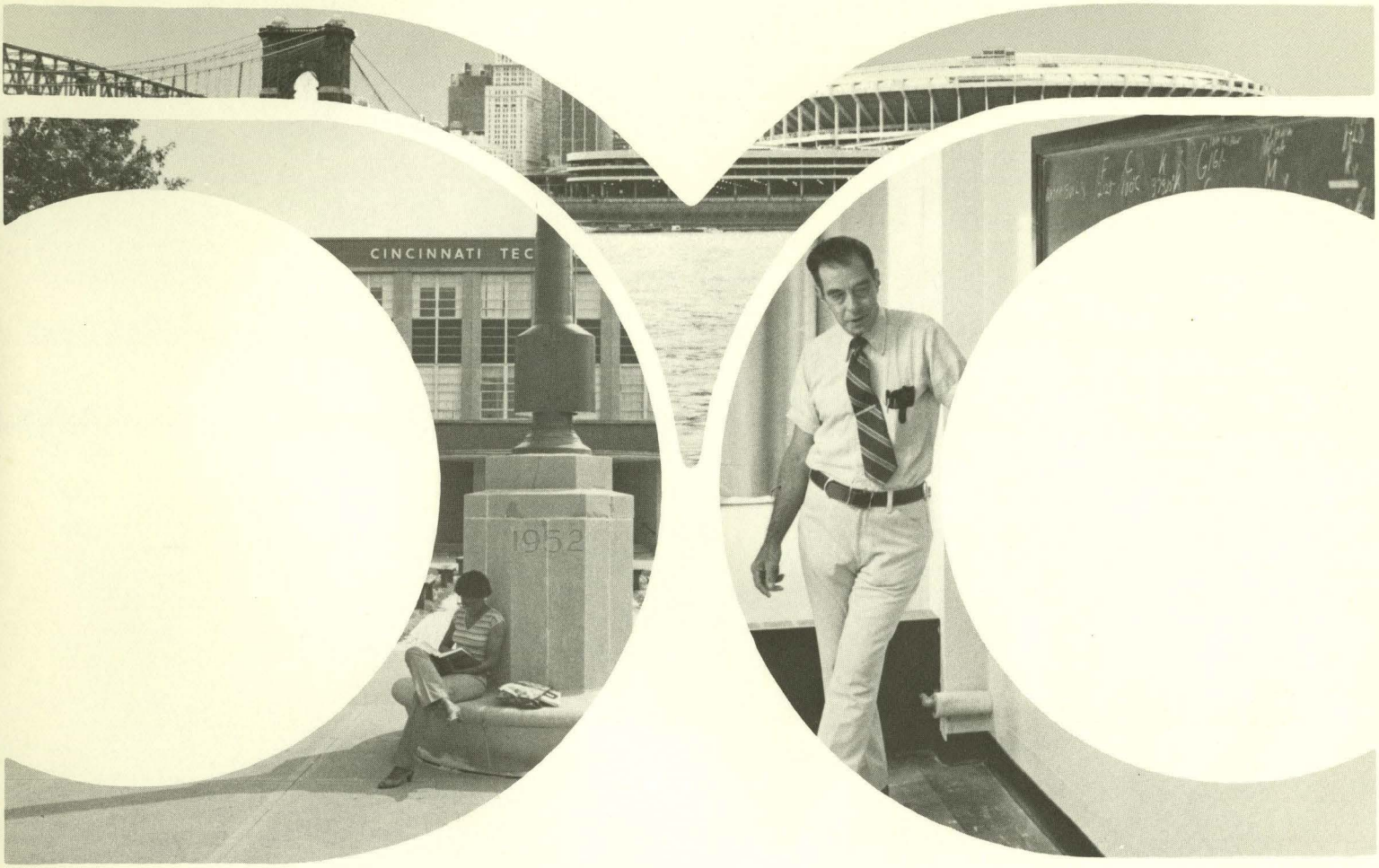
To pursue a degree program at night, the student should apply for admissions and meet the admissions criteria for that program.

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

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ADMISSIONS & FEES

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Admissions Information

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).
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 do one of the following:
   - Call the Admissions Office to make an appointment for an admissions interview with the coordinator of the program you selected.
   - Call to make an appointment for additional diagnostic testing and/or admissions counseling.
   - Wait until your file has been reviewed by the program coordinator after which you will receive notification as to how to proceed.
7. You will receive a decision regarding acceptance at the time of the admissions interview. The acceptance letter will direct you to complete a deposit form and make a deposit.

NOTE: Many programs require that you take a mathematics placement test the day of the admission interview. (The results assist you in choosing a sequence of mathematics courses suited to your abilities.) Inquire about the test when you call the Admissions Office to make your interview appointment with the program coordinator.

Student Deposit

A deposit of twenty-five dollars ($25) 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) will be authorized. Therefore all foreign students should contact the Foreign Student Advisor as soon as possible in order to facilitate enrollment.

Admissions 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. The test takes about 4 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.

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 is less than 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 are non-refundable other than the Instructional Fee.

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

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 14 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 $300 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.

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.

ACADEMICS, POLICIES & PROCEDURES

CATALOG/HANDBOOK 82-83

ACADEMICS, POLICIES & PROCEDURES

CATALOG/HANDBOOK 82-83

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 3 courses (9 credit hours) from at least 2 of the 4 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 this category will be noted in the program to complete their program as schedule 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 a new student who is 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 meet 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

*Non-degree credit hours wil not be calculated in the TGPA.
**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.

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 may 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 Profieciency 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 "I" 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 the same course during the following 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 Offices.

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)

A student who audits 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 verse, 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 provided they were earned at an accredited institution of post-secondary education listed by the American Council of Education.

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 make the request to 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

A student 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.

A currently enrolled student registers for classes during the last two weeks of the term for the next term and/or the alternate term if the student will be out on co-op.

The student must make or arrange tuition payments at least one week prior to the beginning of the term. A student who fails to make payments before the deadline cannot be assured of class schedules consistent with his or her planned program curriculum.

A student 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 subject to any change of degree requirements during the student's absence.

Off-Campus Credits

Credit for courses earned at another institution by a student who 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 terms in the classroom with full-time terms of co-op employment.
2. Attending classes on a half-day schedule for ten consecutive terms and co-oping in a half-time (or longer) position.
3. Pursuing a totally academic program. However, the total number of required credit hours, including co-op credit hours, must be completed. Academic courses and/or work experience may be substituted 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

A student 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. A student who has 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 a student decides 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-type jobs as a second choice; and in C-type jobs as the third choice. However, it should be recognized that both B-type and C-type jobs have many values. The work experience gained in B or C-type jobs prepares the student for occupational advancement and helps the student mature emotionally, socially, and educationally.

College Policies

Equal Opportunity

Cincinnati Technical Colege is committed to a policy of equal educational opportunities for all persons regardless of race, sex, age, handicap, or national origin. This policy is adopted as a matter of law and as a matter of educational policy consistent with the goals and purposes of the College.

The College shall also adhere to a policy of equal employment opportunity and affirmative action to end any illegal pattern of discrimination and to overcome the effects of past discrimination.

Conduct Policy

3357:4-1-98 Conduct of students, staff, faculty and visitors.

(A) Behavior contrary to civil law and/or behavior which interferes with the College's maintenance of order or its educational process is forbidden. Such behavior may result in disciplinary action including, but not limited to disciplinary probation, suspension, dismissal, expulsion, withholding of transcripts or other appropriate action.

(B) The decision as to whether a specific kind of behavior is a violation will rest with the administration. Following are specific but not exclusive examples of behavior prohibited by this section.

(1) Deliberate destruction of, damage to, malicious misuse of, or abuse of College property.
(2) Assault or battery upon another person while on College owned or controlled property.
(3) Theft of property of the College or any private individual which is physically located on College owned or controlled property.
(4) Forgery or alteration of any College identification card, parking permits, or records or information storage systems.
(5) Plagiarism or any behavior involving academic dishonesty.
(6) Illegal manufacture, sale, possession, or use, of alcoholic beverages, narcotics, marijuana, hypnotics, sedatives, tranquilizers, stimulants, hallucinogens or similar controlled substances.
(7) Obstruction or disruption of teaching, research, administration, disciplinary procedures or other College activities.
(8) Participation in or organization of any demonstration, or unauthorized activity which interrputs the functions of the College or interferes with the rights of other members of the College community.
(9) Unauthorized entry into or use of College facilities, either buildings or grounds.
(10) Illegal or unauthorized possession or use of firearms, fireworks, explosives, dangerous chemicals or other weapons on College owned or controlled property.
(11) Deliberate disobedience of or resistence to identified College authorities acting in accordance with College policy.
(12) Drunkenness or gambling on College owned or controlled property.
(13) More than three parking violations per academic term.
(14) Disorderly conduct on College owned or controlled property.
(15) Falsification or deliberate misrepresentation of facts pertaining to admissions, financial aid, or other acts which result in personal or financial benefit.

Effective: May 1, 1978
Promulgated under: Chapter 111.15. of the Revised Code. Rule amplifies Chapter 3345.21 of the Revised Code.

Student Hearing

When a student is in disciplinary difficulty, a faculty/staff committee shall be convened by the Director of Affirmative

Action or a designate.

The student and all members of the committee shall be informed of the alleged violation and a mutually agreeable meeting time will be set. The student has a right to choose an advisor to be present at the hearing.

The committee will hear the evidence, reach a decision and make appropriate recommendations to the appropriate Vice President who will then make a final recommendation. The student has the right to appeal the decision within three (3) working days to the President.

Schedule of Classes

Classes are scheduled between 7:00 a.m. and 10:00 p.m. The full-time load will include five to six hours of instruction per day and twelve (12) credit hours per term.

In the event of adverse weather conditions, it may be necessary to announce a delayed schedule for the day. **The College will rarely close completely.**

Local radio and TV stations will begin announcing CTC's operating status no later than 6:15 a.m. on the day involved.

If an announcement is made that CTC will be operating on a delayed basis the following will be in effect for daytime courses:

NORMAL TIME	DELAYED TIME
7:00 - 7:50	8:00 - 8:50
8:00 - 8:50	9:00 - 9:50
9:00 - 9:50	10:00 - 10:50
10:00 - 10:50	11:00 - 11:50
11:00 - 11:50	12:00 - 12:50
12:00 - 12:50	1:00 - 1:50
1:00 - 1:50	2:00 - 2:50
2:00 - 2:50	3:00 - 3:50
3:00 - 3:50	4:00 - 4:50

The status of evening class will be handled by a separate announcement.

Absences

Each student is expected to attend all classes as scheduled. The instructor may or may not require a student to explain absences, but will avoid rigid classification of absences as "excused" or "unexcused." "Excused" absences for official school functions are the exceptions.

On co-op and clinical placements the employer may have specific guidelines regarding absences, which the student must follow.

Make-Up

The privilege of making up missed assignments, quizzes, tests, exams, etc. is not automatic.

When a student fails to provide evidence and show good cause for being afforded make-up privileges, a course instructor does not have to permit or grant make-up privileges for:

a. failure to turn in assignments when due
b. being absent when quizzes, tests or exams were administered.

In all cases of request for make-up privileges, the burden of proof as to the legitimacy of the reason(s) rests with the student.

The course instructor has the discretion of determining the form and content of documentation of the reason(s) needed as long as the criteria used are reasonable, standard and uniformly applied in all cases of like circumstances.

Grade Reports

It is the student's responsibility to check the grade report form and take the necessary steps to assure accuracy. Errors or omissions in grade reports should be reported to the student's coordinator or the course instructor.

Transcripts

Upon completion of a Request for Transcript Form obtainable in the Records Office, an official transcript of a student's academic record will be forwarded to any employer or educational institution.

The first transcript is free, each addtional transcript is $1.00. Please allow five working days for processing transcripts.

Faculty Office Hours

All College faculty maintain office hours. Students should check with each instructor, or the secretary in the instructor's office area, for appointments.

I.D. Cards

Each student is required to obtain a card showing identity as a student of Cincinnati Technical College. The card is extremely valuable and should be carried at all times. It may be used for admission to certain social functions, the library, pool, gymnasium, voting in campus elections, anything dealing with the Consortium of Colleges and also any other purposes which may be designated by the administration, or various other departments or organizations. I.D. cards are not transferable and are to be presented to any College official upon request. The cost of the card is $1.00.

Release of Information

A student's record contains information which is classified as confidential or public. At CTC, the following data are public information.

1. Name
2. Address
3. Birthday (verify only)
4. Honors/Deans List
5. Technology/Division
6. Co-op Employer
7. Current Course Schedule
8. Full or Part Time Status
9. Parents' Name and Address
10. Dates of Attendance
11. Telephone Number

Public information will be used for releases to newpapers, television and radio.

All other information is confidential and will be released only upon the receipt of written permission from the student or for legitimate College purposes.

Photographs and/or films of students for promotional and recruitment purposes are taken throughout the school year. Students who do not wish to be included in these visuals must inform the Director of Public Information prior to photographing and/or filming.

Personal Telephone Messages

Personal telephone messages can be accepted only in the event of an extreme emergency. Students are asked to advise their parents and friends of this restriction. Office telephones are provided for College business only. Public telephones are located in the main lobby, student activity center and cafeteria.

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.

STUDENT SERVICES

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STUDENT SERVICES

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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 course work.
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 degree 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.

Financial Aid

The purpose of Cincinnati Technical College's financial aid award is to provide financial assistance to those qualified students who, without such aid, would be unable to attend college.

Financial Aid is intended to supplement the student's resources enabling the student to better concentrate on studies. It is not intended to provide a steady source of income on which the student must rely to meet living expenses.

All students must be fully accepted by the College into a degree or certain certificate granting programs before financial aid can be awarded.

Federal programs available include:

Pell Grant — The **Pell Grant** is available to full-time and half-time undergraduate students. It is a grant that does not have to be repaid. The amount of the grant varies for each student.

Supplemental Educational Opportunity Grant (SEOG) — The SEOG program is for students of exceptional financial need who, without the grant, would be unable to continue their education. The Supplemental Educational Opportunity Grant cannot be less than $200 a year.

National Direct Student Loan (NDSL) — The NDSL is for students who are enrolled at least half-time and who need a loan to meet their education expenses.

Money advanced under the NDSL Program represents federal funds in the form of a LOAN, and must be repaid at a minimum of $30.00 per month in accordance with the terms of the NDSL Promissory Note. The rate of interest charged on the loan will be five percent (5%) and repayment period will begin six (6) months after the student leaves the College.

College Work-Study — The College Work-Study program provides jobs for students who have great financial need.

Cincinnati Technical College arranges jobs on-campus and off-campus with a public or non-profit agency.

In arranging a job and determing how many hours a week a student may work, these things are taken into account: (1) **need** (2) **class schedule** and **academic progress.** Students are paid at least minimum wage.

CWS students may not work more than twenty hours per week.

Guaranteed Student Loan Program/Federally Insured Student Loan — The GSL, or FISL enables the student to borrow directly from a bank, credit union, savings and loan association, or other participating lender who is willing to make the educational loan. The loan is guaranteed by a state or private non-profit agency, or insured by the federal government.

The **maximum** a dependent student may borrow as an undergraduate is $2,500 a year. An independent student may

borrow $3000 a year. The interest for new borrowers is nine percent (9%).

The loan must be repaid. Payments normally begin six months after graduation or withdrawal from school and the borrower may be allowed to take up to 10 years to repay the loan. The **amount** of payments depends upon the size of the **debt** and the ability to pay; but in most cases the borrower must pay at least $360 a year unless circumstances agreed upon by the lending institution warrant a lesser amount.

Other Financial Aid Programs

Ohio Instructional Grant (OIG) — The OIG is a state grant program which can only be used for tuition and fees. Students must apply to the Ohio Board of Regents, and carry a minimum of 12 credit hours to receive an OIG grant.

Scholarships — A limited number of scholarships ranging from $24 to $400 are provided by private organizations and community groups. Criteria for the scholarships are established by the donor.

Check with the Financial Aid Office for more information.

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

Anonymous Cooperative Education Scholarship awarded to a Milford High School graduate; selected by high school counselor.

Texo Corporation Cooperative Education Scholarship for Scarlet Oaks Career Development Center graduate, selected by high school counselor.

General Electric Company Technology Scholarships; one each for Aiken High School graduate, Lockland High School graduate and Princeton High School graduate; selected by Engineering Technologies Division.

Anonymous Technology Scholarship awarded to eligible student enrolled in any technology; selected by the Financial Aid Office.

Cincinnati Milacron Technology Scholarship awarded to engineering technology student; selected by sponsor.

Society of Manufacturing Engineers Technology Scholarship awarded to a student in Manufacturing Engineering Technology program; selected by program coordinator.

Statler Foundation Scholarship Fund through the Food Service Executives Association awards several technology scholarships to eligible students in Dietetics, Executive Chef and Hotel-Motel-Restaurant Management program; selected by sponsor.

Xtek, Inc. Technology Scholarship awarded to a student enrolled in Manufacturing Engineering Technology or Electro-Mechanical Engineering Technology; selected by sponsor.

The Williamson Company Technology Scholarship awarded to a student enrolled in Air Conditioning/Heating Technology program; selected by sponsor.

Cincinnati Gas & Electric Company Technology Scholarships: four scholarships yearly for minority and/or women students enrolled in Electrical Power Engineering Technology or Electronics Engineering Technology; selected by sponsor.

Billboard Publications Technology Scholarship awarded to a Managerial Accounting student; selected by sponsor.

Kahn's and Company Technology Scholarships awarded to students enrolled in Electronics Engineering Technology; selected by sponsor.

Springdale Kiwanis Club Service Organization Scholarship awarded to a Princeton High School graduate; selected by sponsor.

Lee B. Weinstein Scholarship awarded to an eligible student in Sales Marketing program; selected by Office of Institutional Development.

Sara E. Donnelly Scholarship awarded to a returning female student in any technology; selected by sponsor.

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

Richard H. Strait Memorial Scholarships: one awarded to a student enrolled in engineering technology program and one to a student in any other technology selected by Office of Institutional Development.

A number of other scholarships from various sponsors are available from time to time in the Financial Aid Office.

Procedures for Applying for Financial Aid include —

a. Apply for admission to Cincinnati Technical College.
b. File an institutional application for financial aid.
c. File a Financial Aid Form (FAF).
d. Ohio residents file an application with the Ohio Board of Regents for an Ohio Instructional Grant.

Deadlines — All applications for financial aid should be completed by March 1 to receive full consideration for all forms of financial aid. Applications completed after July should not expect consideration for campus based funds.

NOTE: Due to pending legislative changes the college reserves the right to amend these regulations without prior notice.

Methods of Disbursement

a. Pell, NDSL, OIG, SEOG — credited to the student's account.
b. **Expense Money** — Any funds (except College Work-Study) in excess of the tuition and book charges will be refunded to the student after the fifth week of the term. No exceptions will be made. Students must plan their budgets accordingly.
c. **College Work-Study Program** — Students who perform work on the College Work-Study Program are paid every two weeks by the College. Timesheets must be submitted to the Financial Aid Office at designated times. Late timesheets will cause a delay in payment.
d. **Book Slips** — Students who have financial aid funds (excluding College Work-Study and OIG) in excess of their tuition costs may obtain from the cashier a book slip authorizing the purchase of books in the Cincinnati Technical College bookstore.
e. **Co-op Earnings** — Each student's financial aid award assumes the student will earn money from co-op employment. If the student does not secure co-op employment, it is sometimes possible for the Financial Aid Office to assist the student through the College Work-Study Program.

Rights and Responsibilities Governing Receipt of Financial Aid

The following information is provided in compliance with federal regulations.

Academic Progress

All federal financial aid recipients must maintain satisfactory academic progress as stated in this catalog (I.E., 18-35 credit hours — 1.50 GPA, 36-53 credit hours — 1.75 GPA, 54-71 credit hours — 2.00 GPA and 72 and over — 2.00 GPA). Additionally, students must always maintain a 2.00 core average. Students who fail to achieve this GPA or core average are given one probationary term on financial aid. If the GPA or core average is not raised to the required level after the probationary term, the student will be notified by the Financial Aid Office that he or she is ineligible for financial aid. The student must also carry to successful completion (earn credit for) 75% of the class credits for which he or she enrolls. Any student whose federal financial aid has been discontinued because of failure to meet academic requirements may request a hearing to review grounds for the discontinuance. The request must be made in writing within ten days after notification of the discontinuance. A student can regain eligibility by taking courses at his/her own expense and raising the GPA.

Employment

All on campus employment must be cleared through the Financial Aid Office. This includes students participating in the Job Locator program. Failure to do so could result in a reduction of the award or liability for overpayment of funds.

Notification of Changes

All aid recipients must notify the Financial Aid Office of the following changes as they occur: change of term, change of credit hour load, change of technology. The Financial Aid Office should be notified of address changes within one week of the change.

Registration

Financial Aid recipients must follow the regular registration process by taking a copy of the award letter and the registration form to the cashier for proof of payment.

Co-op Registration

Remember students must register for co-op.

NDSL

NDSL recipients must complete an NDSL entrance interview form for the year of the loan and complete an NDSL seminar form each term the loan is awarded. Failure to do so could cancel the loan. Exit Interviews are required when leaving CTC.

Attendance

Financial Aid recipients are expected to attend class regularly. Chronic absences can result in (1) cancellation of the financial aid award, especially restrictive funds such as CWS, SEOG and NDSL, (2) a requirement that funds received while not in attendance be repaid to the institution, and (3) delayed expense check. Attendance sheets are required on designated dates. These are available in the Financial Aid Office.

Repeating A Course

Students receiving financial aid or veterans' benefits should check with the Financial Aid Office or the VA coordinator before registering for couses in which they previously received a grade of "C" or above. Federal and state regulations may prohibit students from receiving funds for a repeated course or from considering it toward full-time status (12 credit hours).

Incompletes

Financial Aid recipients are exected to complete all courses attempted. An "Incomplete" or "N" is not an acceptable grade.

Credit Hour Load

Financial Aid recipients are expected to carry a full-time load (12 credit hours excluding co-op hours). Permission for exceptions must be granted in advance. The amount of the award will vary with the number of credit hours, six (6) being the minimum. Full awards are granted for full-time students (12 credit hours) only.

Course Withdrawals

Students who register for 12 credit hours but withdraw from courses could be liable to repay the over-award.

Pell Funding During The Co-op Terms

Pell Grant Funds awarded during co-op terms are conditional upon a student's receiving co-op employment, registering for co-op and submission of a co-op verification form available in the Financial Aid Office. Final responsibility for securing co-op employment rests with the student. If a student is unable to secure a co-op position, the Financial Aid Office can sometimes assist in finding a co-op job. Should the student fail to secure acceptable co-op employment, or attend classes on a full-time basis, the student is not entitled to the grant and the Pell Grant funds are refunded to the federal government. A co-op verification form must be submitted to the Financial Aid Office. Students must register for co-op.

Other Aid

Financial aid recipients must notify the Financial Aid Office of any other sources of aid. All employment earnings must be reported. This includes co-op earnings or other part-time employment not reported on the student's Financial Aid Application. This also includes funds from Job Locator & Development.

Renewal/Reapplication

Financial Aid awards for the 1982-83 academic year expire in June, 1983. If you wish to receive aid after June, 1983, you must reapply by March 1, 1983.

Courses Outside Your Technology

80% of the course work funded through financial aid funds must be applicable toward a particular degree as stated in the CTC catalog or catalog supplement.

For more information, students should consult the CTC Financial Aid Handbook, "Feeling the Squeeze?" or come to the Financial Aid Office in room 159.

Please Note: If a student defaults on unpaid tuition, the Cincinnati Technical College has the right to dismiss that student for financial deficiency and take legal action against that student and/or co-signer to satisfy the outstanding balance. If a student withdraws or leaves the College, that student and/or co-signer are still financially responsible for all unpaid tuition and fees.

No degree will be granted or transcript provided until all financial obligations are completely paid.

Student Activities

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 Na-

tional 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 1981-82 season the Tigers were runners-up in the southern division of their region.

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.

VIP Association

This is a volunteer organization of students who act as hosts or hostesses, serve as tour guides, usher at Commencement and participate in a variety of activities as their schedules permit. All students with a 2.5 TGPA are eligible and can apply by contacting Miriam Pizzuto in room 156.

Student Organizations

Students are encouraged to join organizations for designed special interests. Business Technology students can apply for membership in the Office Education Association (OEA). There are others such as the Society for Manufacturing Engineers (SME), the Junior Food Service Executive Association (JFSEA) and the Junior Litho Club. For additional information check with the Student Office or program coordinator.

Alumni Association

The students at Cincinnati Tech have always displayed a special type of loyalty and support.

Upon graduation, many continue to support the school's philosophy of cooperative career education and the traditions established in CTC's brief history.

Following the school's fourth graduating class the graduates of CTC formed the Cincinnati Technical College Alumni Association in early 1972. The association was organized to promote the general welfare of the College and to create and maintain an active interest among the alumni in extending the influence of the College. The association also provides a means of perpetuating friendships among alumni and in the future will aid the College in providing facilities to meet the educational needs of society.

Facilities

Use of College Facilities

Students presenting College I.D. cards may use such facilities as the gymnasium, natatorium, weight room, library, student center, meeting rooms, etc. Such use is restricted to hours set aside for student use for freetime recreation. These hours will not conflict with previously scheduled events, and may be subject to change because of short term scheduling of intramurals, athletics, community use, etc.

Students or student groups may lease on-campus facilities through the Office of the Director of Student Activities.

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 courteous 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.

All students enrolled in the Cincinnati Technical College are encouraged to use the Learning Resource Center. Please observe the following rules and regulations:

Quiet Zones — An atmosphere of quietness conducive to good study habits shall prevail.
Group Study — Students who wish to study together must use the rooms set aside for group study.
Smoking, Eating & Drinking — Smoking is not permitted. Neither food nor drink may be brought into the Center.
Inspection — Upon leaving, all bags, briefcases and parcels are subject to inspection.
Proper Charging — No books may be taken from the LRC without being charged out and signed for at the Circulation Desk.
Overdues — Fines — No books will be issued students who repeatedly keep books overtime. A fine of $.10 per day is charged for each circulation book kept overtime. Reserve books are charged ten cents an hour if not returned by 8 a.m. the following morning on school days.
Lost Books — Lost or damaged books must be paid for by the borrower. A $5.00 processing fee will be added to the cost.

Circulation Policies and Procedures

To Borrow a Book — To borrow a book a student presents his or her I.D. card. The Librarian or Assistant will stamp the DUE DATE on the card beside the borrower's signature and on the book's DATE DUE SLIP letting the student know when the book is to be returned.
Length of Loan — Circulating Books may be kept three weeks. They may be renewed if thee are no requests for them. **Reserve Books** circulate according to faculty members' instructions who place them on reserve. **Overnight Reserve Books** which are used during the day may be checked out after 3 p.m. and must be returned by 8 a.m. the following school day.
Restricted Materials — Closed Reserve Books, Periodicals, and Reference Books may not be charged out and may be used only in the LRC.
Return of Books — Library books must be returned to the Circulation Desk by the borrower on or before the DATE DUE. Each borrower is responsible for all books signed out.
Book Depository — The Book Drop is located to the right of

the Main Entrance. It is to be used for book returns when the Learning Resource Center is CLOSED.

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.

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 a.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.

Dining Facilities

There are two separate dining facilities to serve CTC students. They are:

The Stateroom — Students may purchase excellently prepared, full course hot lunches, as well as ala carte specialties.

The Stateroom is open from 11:00 a.m. to 12:30 p.m. each Tuesday, Wednesday and Thursday of the second through eighth week of each school term. The seating capacity is extremely limited; therefore, students are accommodated on a first come, first served basis.

Breakfast is also served from 7:30 to 8:30 a.m.

The Stateroom is completely manned by students from the Hotel/Motel, Executive Chef and Dietetics technologies.

The Cafeteria on the third floor offers a wide selection of vending machines, drinks, foods, hot and cold — also a microwave oven. This area is open from 6:30 a.m. to 10:00 p.m. daily.

The Cafeteria is operated by Canteen, Inc.

Gymnasium

The gymnasium is open to "free play" from 8 a.m. to 5 p.m. Monday through Friday. Facilities available include volleyball, basketball, tumbling mats, footballs, soccer balls, and softball equipment. I.D.'s are required to acquire equipment.

Pool

The pool is open for free swimming Monday through Friday from 10:30 a.m. to 5:30 p.m.

Activities Center

This area features a game room with pool tables, ping pong, foose ball, pin ball, card tables, etc., a snack and lounge area. I.D.'s are required to use this facility. Hours - 8:00 a.m. - 4:30 p.m. & 5:30 p.m. - 8:30 p.m.

Activities Center, Pool, Gym Rules

1. Students using the center must have their CTC I.D. card and Drivers License and show them upon request.
2. Food and drink will **not** be allowed in the gym, exercise room or pool.
3. No smoking allowed in the gym, exercise room or pool.
4. **No** street clothes allowed in pool area.
5. No swimming suits allowed in other activities areas.
6. Students must present I.D. to lifeguard while using pool area.
7. Please place all cigarettes in ashtrays and all trash in trash containers.
8. I.D.'s must be presented to use equipment.
9. Loud or disruptive behavior will not be tolerated.
10. All students are encouraged to shower after activity.
11. Gym shoes must be worn when using the gymnasium. (Street shoes with soft soles are not permissible.)
12. It is recommended that gym clothes be worn when using the gymnasium.

Lounges

The main student lounge, located on the third floor, and the snack lounge area in the student activity center provide areas for students and faculty to gather between classes and discuss mutual interests, listen to music, or just relax. A food service and vending machines offering a large selection of food and drinks or snacks are available.

Facilities for the Handicapped

The College has renovated areas to make its facilities more accessible to handicapped students. Outdoor and indoor ramps, elevators and specially designed restroom facilities are available to assist any physically disabled person.

Parking & Traffic Regulations

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. The parking plans and rates are as follows:

1. **The Term Reserved Space Plan (TRS)**
   This plan permits a student to park in any of the four areas marked in yellow lines on campus. The TRS plan can be purchased for $25 per term. Those areas open to the TRS parking plan are the lower lot, some hilltop spaces, the gravel lot and the front and back drive.
2. **The Registered Vehicle Plan (RVP)**
   This plan permits a student to park in the stadium parking lot. The fee for this plan is $7 plus 50¢ per day.
3. **The Registered Vehicle (RVM) (Motorcycle)**
   The RVM plan permits students to park motorcycles on campus. Students must park motorcycles in the areas specifically marked. The fee for this plan is $10 per term.
4. Upper lot parking for night school will be 50¢ per car, per night, if paid at the guard house or a parking card can be purchased for $5 when a student registers. This card entitles the student to park for 13 nights. These cards will be punched upon entry by the gate attendant.
   Stadium parking for night school is 50¢ per car, per night, or students can purchase a $4 coupon book good for ten parking privileges.

Traffic Regulations

Traffic Regulations will be strictly enforced. Violators will face monetary fines and possible loss of parking privileges and/or transcript until fines are paid; also prevention from purchasing on-campus parking for future terms.

The following policies and procedures will be in effect on the first day of classes and will apply to all persons driving vehicles onto campus.

- One-way traffic is in effect up the entire front drive around A & B wings, and down the back exit drive.
- One-way traffic is also in effect across the front of the building going north around the back of F & G wings, (across from the gravel lot) continuing around the rear of building and down the exit drive.
- Only those students with current parking decals will be able to bring their vehicles on campus.

Parking regulations will be strictly enforced. Violators face monetary fines and possible loss of parking privileges and/or tow away for chronic offenders.

The following are violations and the fines that accompany them:

Parking

1.	Crosswalk	$ 3.00
2.	Blocking Driveway	5.00
3.	Parking in or blocking fire lane	10.00
4.	Overtime parking, limited parking area	2.00
5.	Disregarding posted signs: no stopping, no parking, loading, tow away zone	5.00
6.	Parking in a manner to use two stalls	5.00
7.	Parking disregarding painted curbs	3.00
8.	Parking outside permitted decal areas	3.00
9.	Parking in reserved area(s)	5.00

Moving

10.	Wrong direction on one-way street	15.00

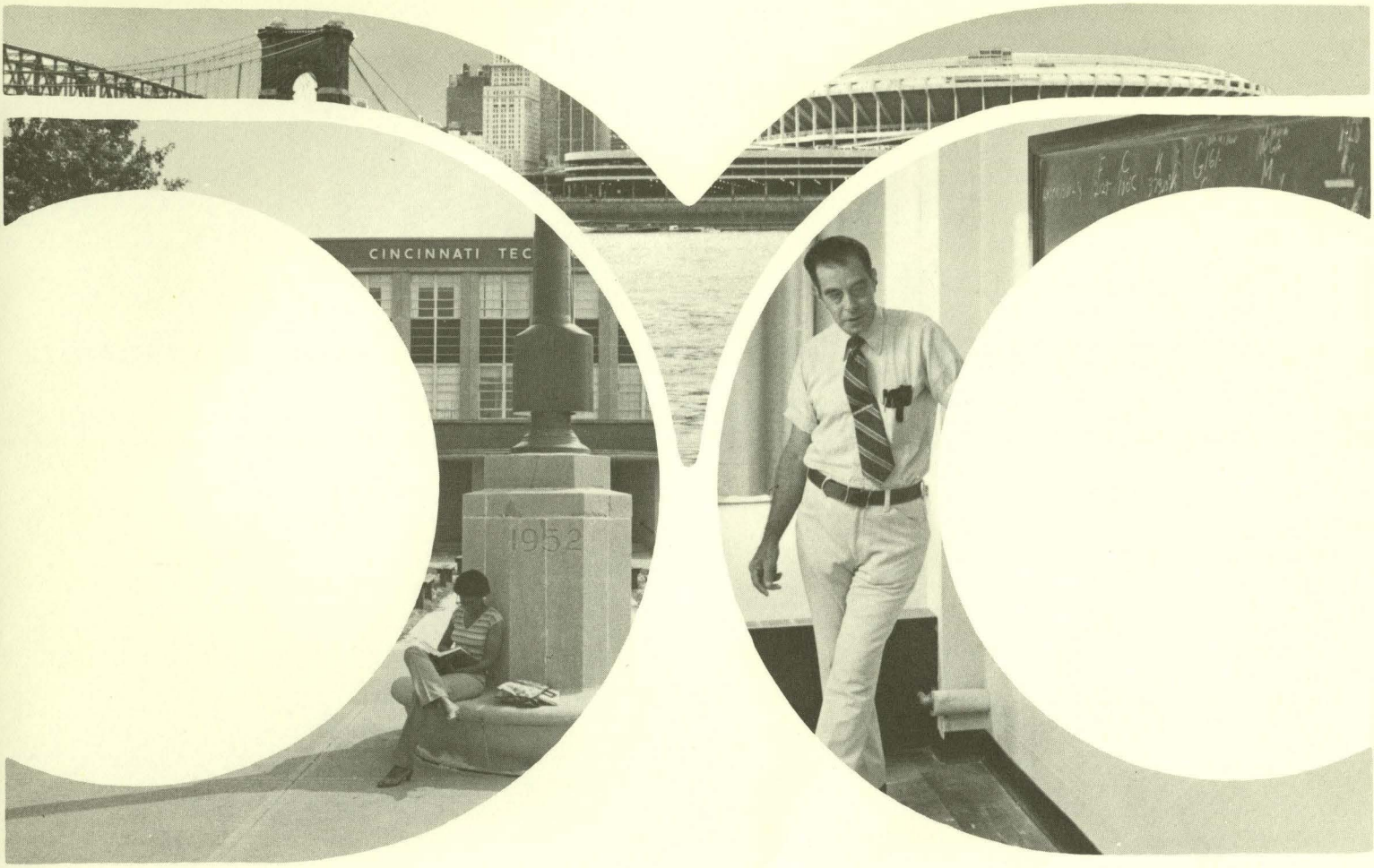
Other

11.	No parking permit (decal) or not displayed	5.00
12.	Vehicle not registered	5.00
13.	Towing and impoundment	Cost
14.	Disregard of barricades	10.00
15.	Reproducing, altering or defacing a parking decal or permit. Using a stolen or revoked permit or decal. (Tow & Impound)	Cost
16.	Other	5.00

Failure to pay fines will result in the holding of transcripts until such fines are paid; also prevention from purchasing on-campus parking for future terms.

LOCK YOUR CAR

Cincinnati Technical College assumes no responsibility for any loss or theft of any automobile or any part thereof; or for any article left therein; or for any damage which may be caused by fire, trespassers, collision, etc.



ACADEMIC DIVISIONS, DEGREE & CERTIFICATE PROGRAMS

CATALOG/HANDBOOK 82-83

ACADEMIC DIVISIONS, DEGREE & CERTIFICATE PROGRAMS

CATALOG/HANDBOOK 82-83

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.

Communications 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 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.

Prerequisites for all programs are available at CTC.

Dietetic Assistant/ Dietetic Technician (nutrition care emphasis)

CTC's one-year Dietetic Assistant program and two-year Dietetic Technician program are approved by the American Dietetic Association (ADA).

The Dietetic Assistant assists the Registered Dietitian and Dietetic Technician in nutrition care and food service supervision. The Technician is responsible for many aspects of health care from nutrition care and education of clients to the management of institutional food service.

Upon completion of the Dietetic Assistant program the student is awarded a certificate and may begin immediate employment, or the student may continue (if accepted) an additional year towards the associate degree Dietetic Technician program.

Both programs include unpaid directed practice at area hospitals, health agencies and extended care facilities. Each program also includes two terms of paid cooperative employment.

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
10xx Communication Skills Elective I	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 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
10xx 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
15xx 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
10xx Communication Skills Elective 4	3	0	3
15xx Social Sciences Elective	3	0	3
	13	8	14
			53
Total 1st & 2nd years			108

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 program is an associate degree program which includes clinical rotations or externships which are supervised work experiences for students to develop competencies in skills needed by the Medical Assistant. Students receive no monetary reimbursements for these experiences.

Medical Assistants have both administrative and clinical responsibilities. Administrative tasks include scheduling, handling correspondence, filing, maintaining patient records and reports, and processing insurance forms. Clinical duties involve recording of histories, taking vital signs, preparing parents for examinations, giving injections, and performing routine tests.

CTC's Medical Assistant program is accredited by the American Medical Association's Committee of Allied Health Education and Accreditation (CAHEA) in collaboration with the American Association of Medical Assistants (AAMA).

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 AAMA.

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			
4211 MA Clinical Experience I	0	20	3
■ 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			
4212 MA Clinical Experience II	0	20	3
10xx Communication Skills Elective 3	3	0	3
15xx Social Sciences Elective	3	0	3
15xx 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			
4213 MA Clinical Experience III	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			
9301 Cooperative Employment	1	40	2
			106

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
Group 4 - Community Relations: 1531, 1533, 1536, 1537
Three courses from at least two groups.

Medical Laboratory Technician

The Medical Laboratory Technician program is an associate degree program which includes two terms of unpaid clinical laboratory experience and two terms of paid cooperative employment.

Medical Laboratory Technicians are employed in hospitals, clinics, or laboratories and may specialize in one or two areas of laboratory work, or rotate through all departments of a laboratory. Laboratory areas include biochemistry, hematology, microbiology, blood bank and serology.

The program has had its site visit for accreditation by the National Accrediting Agency for Clinical Laboratory Services. CTC has been informed that the program exceeds all requirements for accreditation. A formal letter of notification of accreditation by the American Medical Association's Committee of Allied Health Education and Accreditation should be received in October, 1982.

Graduates may apply to the Board of Registry of the American Society of Clinical Pathology (ASCP) to take the certification examination. Persons passing the exam are recognized as Medical Laboratory Technicians — MLT(ASCP).

Medical Laboratory Technician Curriculum

Prerequisites: High school algebra, biology & chemistry	Hours Per Week Class	Lab	Credit Hours
■ First Term			
4011 General Anatomy	2	3	3
4005 Chemistry for Health Technology	3	2	4
4301 Basic Laboratory Techniques	2	3	3
4302 Basic Hematology & Urinalysis	4	6	6
4311 Clinical Application I - Hematology & Urinalysis	0	6	2
	11	20	18
■ Second Term			
4012 Human Physiology I	3	2	4
4351 ML Clinical Experience I	1	24	4
	4	26	8
■ Third Term			
11xx Mathematics Elective	4	0	4
4001 Introduction to Health Care System	2	0	2
4303 Immunology	3	0	3
4304 Clinical Chemistry	4	3	5
4312 Clinical Application II - Clinical Chemistry	0	6	2
10xx Communication Skills Elective 1	3	0	3
	16	9	19
■ 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
15xx Social Sciences Elective	3	0	3
2244 Health Physics I	3	2	3
	13	17	18
■ Sixth Term			
9302 Cooperative Employment	1	40	2
■ Seventh Term			
10xx Communications Skills Elective 2	3	0	3
4306 Clinical Microbiology	4	6	6
4307 Hematology II	2	3	3
4314 Clinical Application IV - Clinical Microbiology	0	6	2
15xx Social Sciences Elective	3	0	3
	12	15	17
■ Eighth Term			
9303 Cooperative Employment	1	40	3
■ Ninth Term			
1020 Effective Speaking	3	0	3
4020 Fundamentals of Pathophysiology	5	0	5
4308 Special Laboratory Procedures	1	3	2
4309 Medical Lab Seminar	3	0	3
10xx Communication Skills Elective 4	3	0	3
15xx Social Sciences Elective	3	0	3
	18	3	19
			112

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 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.

Recommended Mathematic Electives
1131, 1132, 1140, 1141 or 1142 based on Placement Test and decision of Program Coordinator.

Medical Record Technology

CTC's program is accredited by the American Medical Association's Committee of Allied Health Education and Accreditation in collaboration with the American Medical Records Association (AMRA).

Medical Record Technicians are responsible for preparing, analyzing and preserving health information in hospitals, clinics, nursing homes, insurance companies and health maintenance organizations.

Students spend every other term in paid cooperative education experience.

Graduates are eligible to take the National Accreditation Examination of the American Medical Record Association for the designation A.R.T. (Accredited Record Technician).

Medical Record Technology Curriculum

Prerequisites: High school biology, chemistry & typewriting (40 wpm) or equivalent	Hours Per Week Class	Lab	Credit Hours
■ First Term			
10xx Communication Skills Elective 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			
10xx Communication Skills Elective 2	3	0	3
4011 General Anatomy	2	3	3
4400 Medical Terminology & Transcription	3	6	6
4402 Medical Record Science II	3	2	4
4408 Advanced Medical Terminology	3	0	3
	14	11	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
15xx 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
xxxx Basic Elective	3	0	3
15xx Social Science Elective	3	0	3
	17	12	19
Tenth Term			
9305 Cooperative Employment	1	40	3
			105

Recommended General Electives
Communication Skills Elective 1 - 1001 or 1002
Communication Skills Elective 2 - if 1001 first: 1002, 1009
- if 1002 first: 1007, 1009

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
1701 Introduction to Data Processing
1711 Introduction to Data Management
1832 Personnel Management
2926 Principles of Management
3001 Typewriting I
3002 Typewriting II
3021 Office Procedures
4005 Chemistry for Health Technology
4009 General Microbiology
4017 Pharmacology
4105 Human Growth & Development
4131 Developmental Nutrition

Respiratory Therapy Technician/ Respiratory Therapist

Respiratory Therapy education at CTC consists of a one-year certificate program and an associate degree program.

Students are trained to administer gas therapy, humidity therapy, aerosol therapy and intermittant positive pressure breathing techniques. Graduates should be able to assist with long-term, continuous artificial ventilation and special diagnostic and therapeutic procedures.

The technician program is one year in duration and concludes with the awarding of a certificate. This program does not include paid cooperative education as students spend one year in course work and unpaid clinical experiences.

The certificate and associate degree programs are accredited by the American Medical Association's Committee of Allied Health Education and Accreditation in collaboration with the Joint Review Committee for Respiratory Therapy Education. Technician program graduates may apply for the certification examination administered by the National Board for Respiratory Therapy (NBRT) after working for one year as required by the NBRT. Candidates who complete these requirements are recognized as Certified Respiratory Therapy Technicians (CRTT).

Students may elect to continue into the second level of respiratory therapy education. This level, the Respiratory Therapist program, is a continuation of the first year, and graduates are granted an associate degree. The program does not include paid cooperative education. Graduates may apply for the registry examination administered by the NBRT for recognition as Registered Respiratory Therapists (RRT).

Respiratory Therapy Technician Certificate Curriculum

Prerequisites: High school biology, algebra & chemistry	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
4718 Pulmonary Diseases I	2	0	2
10xx Communication Skills Elective 1	3	0	3
	11	15	15
Fourth Term			
2244 Health Physics	3	2	3
4704 Respiratory Therapy Science IV	3	2	4
4713 RT Clinical Practice III	0	30	5
4719 Pulmonary Diseases II	2	0	2
	8	34	14
Fifth Term			
4705 Respiratory Therapy Science V	3	2	4
4714 RT Clinical Practicum I	0	30	4
	3	32	8
			65

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
10xx Communication Skills Elective 2	3	0	3
15xx 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
10xx 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
10xx Communication Skills Elective 4	3	0	3
15xx Social Sciences Elective	3	0	3
15xx 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			117

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

In Surgical Technology the student has the option of pursuing a one-year certificate course of study or an associate degree. The associate degree option requires the student to successfully complete additional general education and basic science courses. No paid cooperative experience is provided in either program.

Surgical Technologists are trained in basic scrub functions directly assisting the surgeon. They also prepare and care for sterile supplies and equipment and assist the registered nurse with circulating duties in the operative suite.

After successfully completing the requirements 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 (CST).

This program is accredited by the American Medical Association's Committee of Allied Health Education and Accreditation in collaboration with the Joint Review Committee for Surgical Technologists.

Surgical Technology* Certificate Curriculum

Prerequisites: High school biology & chemistry	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	0	5
4020 Fundamentals of Pathophysiology	5	0	5
4031 Health Care Management	3	0	3

Students must complete 21 credit hours from the following courses. Three credit hours must be taken from each of the four Communication Skills Elective groups. Nine additional credit 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	3	6
■ November Term			
3002 Typewriting II	2	3	3
4012 Human Physiology I	3	2	4
	5	5	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
■ 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 seventeen 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 seventeen 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

Automotive Service Management 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.

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	2	3	3
2502 Automotive Technology II	5	10	8
	14	13	18
■ Second Co-op Term			
9202 Cooperative Employment	3	40	2
■ Third School Term (June & September)			
2909 Office Accounting I	3	2	3
2925 Business Principles	3	0	3
1512 Microeconomics	3	0	3
2222 Technical Physics II	2	3	3
2503 Automotive Technology III	2	8	5
2510 Automotive Management I	2	3	3
	15	16	20
■ 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
1535 Labor Management Relations	3	0	3
2504 Automotive Technology IV	2	8	5
2511 Automotive Management II	2	3	3
7810 Welding Skills	3	3	3
	16	14	20
■ Fourth Co-op Term			
9204 Cooperative Employment	4	40	3
■ Fifth School Term (April & June)			
1020 Effective Speaking	3	0	3
1850 Computerized Business Applications	2	3	3
1823 Business Law I	3	0	3
2505 Automotive Technology V	5	10	8
2903 Survey of Marketing	3	0	3
	16	13	20
■ 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.

Business Data Management Technology

In the Business Data Management Technology at Cincinnati Technical College, students learn the principles of both management and data processing. Business Data Management training fills the need for personnel who can administer data processing operations.

Business Data Management Technology Curriculum

Prerequisites: algebra & typewriting	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
2925 Business Principles	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			
**xxxx Elective	4	0	4
1721 Programming Logic & Methods	2	3	3
1740 Operating Systems	4	6	6
2913 Principles of Accounting III	3	2	3
15xx Social Sciences Elective	3	0	3
	16	11	19
■ 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
1823 Business Law I	3	0	3
2926 Principles of Management	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	1	3	2
2921 Managerial Accounting	1	3	2
2903 Survey of Marketing	3	0	3
	15	13	20
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			107

*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.

**Elective subject to approval of program coordinator.

For 15xx electives refer to the 15xx series section in course descriptions.

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.

Business Data Processing Technology Curriculum

Prerequisites: algebra & typewriting	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	4	6	6
1721 Programming Logic & Methods	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
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			
** xxxx 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
1823 Business Law I	3	0	3
	16	13	20
■ 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
1783 Research Project	1	3	2
15xx Social Sciences Elective	3	0	3
2903 Survey of Marketing	3	0	3
2926 Principles of Management	3	0	3
	17	9	20
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			110

*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 experience and aptitude.

**Elective subject to approval of program coordinator.

For 15xx electives refer to the 15xx series section in course descriptions.

Business Management Technology

Business Management students receive a combination of business training and business experience by working with instructors experienced in management, personnel procedures, finance, accounting, sales, office organization, and related subjects. Learning experiences are provided through field trips, guest lecturers, case studies and modern visual presentations.

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
2921 Managerial Accounting	2	3	3
2960 Principles of Finance	3	0	3
	17	3	18
■ 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
			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.

Executive Chef Technology

In addition to this associate degree program, CTC offers a chef's apprenticeship program. Much of the course content is the same as that of the Executive Chef degree program. This certificate program includes practical training and classroom instruction and can be completed on a part-time or full-time basis. Courses taken in the certificate program can be used to pursue an associate degree should the student decide to continue.

The certificate program meets all of the educational requirements set by the National Standards for Journeyman Chef, the Les Chefs de Cuisine of Greater Cincinnati and the American Culinary Federation.

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	3	0	3
2822 Fundamentals of Food Preparation I	2	4	3
2911 Principles of Accounting I	3	2	3
	17	10	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
2802 Restaurant Management II	2	4	3
2823 Food Preparation II	2	4	3
2912 Principles of Accounting II	3	2	3
2925 Business Principles	3	0	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
1850 Computerized Business Applications	2	3	3
2804 Restaurant Management IV	3	0	3
2825 Food Preparation IV	2	6	3
	16	9	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
1823	Business Law I	3	0	3
2805	Restaurant Management V	3	0	3
2815	Hotel-Motel Management V	3	0	3
2821	Sales Techniques	3	0	3
2826	Food Preparation V	2	6	3
		20	6	21
■ **Fifth Co-op Term**				
9205	Cooperative Employment	4	40	3
				108

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Graphic Communications Technology

At CTC modern computerized typesetting equipment, letterpress and offset presses, screen printing, ancillary equipment are combined with experienced instructors to provide a quality graphic arts program.

Although students study all of the major modern graphic arts processes, the scope of the program is not limited to the development of craftsmanship. The Graphic Communications program also provides mid-management training as well as technical knowledge.

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	3	0	3
1402	Typography	2	6	4
1415	Graphic Arts Processes	2	3	3
2925	Business Principles	3	0	3
		15	12	19
■ **First Co-op Term**				
9201	Cooperative Employment	3	40	2
■ **Second School Term (January & April)**				
1002	Communication Skills II	3	0	3
1410	Machine Composition & Newspaper Design	1	9	4
1460	Bindery Method/Procedures	2	3	3
1512	Microeconomics	3	0	3
1850	Computerized Business Applications	2	3	3
2261	Printing Science I (Chemistry)	3	2	4
		14	17	20
■ **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)	2	3	3
		14	15	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
				108

Hotel-Motel-Restaurant Management Technology

CTC's Hotel-Motel-Restaurant Management students receive comprehensive knowledge of all the departments and operations found in the hospitality industry. Students are involved early in these fields through paid cooperative work experience so they can set their goals on the type of career they wish to follow in the industry.

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	3	0	3
2811	Hotel-Motel Management I	3	0	3
2911	Principles of Accounting I	3	2	3
		18	6	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
2802	Restaurant Management II	2	4	3
2812	Hotel-Motel Management II	3	0	3
2912	Principles of Accounting II	3	2	3
2925	Business Principles	3	0	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
1850	Computerized Business Applications	2	3	3
2804	Restaurant Management IV	3	0	3
2814	Hotel-Motel Management IV	3	0	3
		17	3	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
1823 Business Law I	3	0	3
2805 Restaurant Management V	3	0	3
2815 Hotel-Motel Management V	3	0	3
2821 Sales Techniques	2	0	2
	17	0	17
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			104

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Loss Control - Security Technology

CTC's Loss Control program is one of the first of its kind in the country. The curriculum was established in collaboration with the tri-state chapter of the American Society for Industrial Security. The program offers classroom instruction and practical training requirements of private security practitioners.

Because of the nature of co-op work schedules, the student can attend classes during the day or evening.

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	2	3	3
	16	6	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
1505 Psychology of the Inner World of the Person	3	0	3
1240 Directed Case Study	3	0	3
1521 Introduction to Sociology	3	0	3
1850 Computerized Business Applications	2	3	3
2903 Survey of Marketing	3	0	3
	18	3	19
■ 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.

Managerial Accounting Technology

Managerial Accounting, for those with a high degree of skill in accounting, provides knowledge of business fundamentals and an understanding of accounting skills, and how these systems are applied in small and large businesses and in industrial systems.

In addition to preparation in managerial, financial and tax accounting, students will be given a sound background in administrative skills and management philosophy.

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
2903 Survey of Marketing	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
2919 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

Students may elect to specialize in either Landscaping or Floriculture during their fourth, fifth or sixth terms by enrolling in certain technical courses.

Because of the unique seasonal employment requirements of horticulturally related jobs, this program follows a different co-op schedule. Ornamental Horticulture students spend two consecutive terms (during the growing season) in cooperative employment during each of the two years in the program.

Ornamental Horticulture Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September)			
1001 Communication Skills I	3	0	3
117x OR 119x - Technical Mathematics Elective	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	1	1
	16	5	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
22xx Chemistry Elective	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
3511 Landscape Construction	2	4	3
	13	8	15
■ Fifth School Term (November)			
2926 Principles of Management	3	0	3
2909 Office Accounting I	3	2	3
3506 Nursery Management	2	3	3
3518 Advanced Landscape Design	2	4	3
3532 Landscape Maintenance	2	3	3
3515 Woody Plant Materials II	2	3	3
	14	15	18
■ Sixth School Term (January)			
1010 Technical Writing	3	0	3
1512 Microeconomics	3	0	3
1810 Principles of Salesmanship	3	0	3
1823 Business Law I	3	0	3
1850 Computerized Business Applications	2	3	3
3519 Landscape Contracts & Specifications	3	0	3
3531 Horticulture Seminar II	1	1	1
	18	4	19
■ Third Co-op Term (April)			
9503 Cooperative Employment	1	40	3
■ Fourth Co-op Term (June)			
9504 Cooperative Employment	1	40	3
			111

Ornamental Horticulture/Floriculture Technology Curriculum

	Hours Per Week Class	Lab	Credit Hours
■ First School Term (September)			
1001 Communication Skills I	3	0	3
*117x OR Technical Mathematics Elective	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	1	1
	16	5	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
22xx Chemistry Elective	3	2	4
3525 Plant Propagation	2	3	3
	14	5	16
■ Third School Term (Janauary)			
1512 Microeconomics	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
1850 Computerized Business Applications	2	3	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
		15	10	18
■ Fifth School Term (November)				
1823	Business Law I	3	0	3
2909	Office Accounting I	3	2	3
2926	Principles of Management	3	0	3
3542	Retail Florist Management	2	4	3
3543	Floriculture Production II	2	3	3
		13	9	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
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Property Management Technology

CTC was the first college in the country to offer an associate degree in Property Management. The curriculum is based on textbook course materials, class discussion and case studies. Publications of the Institute of Real Estate Management and the National Association of Realtors also are utilized.

Students receive instruction from certified property managers. Five of its technical courses (2931, 2932, 2933, 2934 and 2935) also are offered only in the evening. The curriculum includes required courses for the Ohio real estate license.

In many cases co-op employment requires a state real estate license. The program is such that an academic half-day schedule may be maintained until degree requirements are satisfied.

As in most technologies, co-op employment is conditioned upon a jobs-available basis.

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
1021	Human Relations	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
		19	1	19
■ 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
1505	Psychology of the Inner World of the Person	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
1850	Computerized Business Applications	2	3	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
		16	6	18
■ 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.

Real Estate Technology

CTC's Real Estate technology, directed by a licensed real estate broker, helps students and professionals with their career development.

Students may follow a sequenced, six-course program which meets all the requirements to qualify for the Ohio Real Estate Sales Associate and Broker's license examinations. The associate degree curriculum includes all required courses for the real estate license and the GRI designation.

During the program, the student is encouraged to secure the state real estate license early in the schedule in order to gain actual co-op work experience. A half-day schedule may be maintained for degree requirements until graduation. Co-op work in this technology always requires a state real estate license.

The program can be combined with certain property management courses for a double major.

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
1021 Human Relations	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
	19	0	19
■ 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
1505 Psychology of the Inner World of the Person	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
1850 Computerized Business Applications	2	3	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
	16	8	19
■ Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			106

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Sales Marketing Technology/ Industrial Sales Marketing Technology

In the Sales Marketing program, the most important objective is developing talent for the sales marketing professions. The kinds of cooperative employment presently held by Sales Marketing students are as varied as the marketing area itself.

Students in the Industrial Sales Marketing program attend day and evening classes. This option focuses on selling in the industrial-commercial area.

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
1850 Computerized Business Applications	2	3	3
1832 Personnel Management	3	0	3
2901 Principles of Marketing I	3	0	3
	17	3	18
■ 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
			102

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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

		Hours Per Week Class	Lab	Credit Hours
*1120	Introduction to Business Mathematics	4	0	4
1846	Industrial Product Marketing I	4	0	4
1810	Principles of 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
1850	Computerized Business Applications	2	3	3
1817	Industrial Purchasing	4	0	4
1521	Introduction to Sociology	3	0	3
		15	3	16
■ 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
				107

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Secretarial Technologies

Three majors are available in the Secretarial program: general, executive and word processing. The curricula include not only technical skill development but also courses in business principles.

The new Word Processing curriculum prepares an individual to be a word processor or a word processing supervisor. In this program hands-on classroom experience on both stand-alone and time-shared systems will be utilized. Many management courses will be available in the curriculum for those who wish the management aspect of word processing.

Advanced placement in shorthand and typing is available only through testing.

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
1512	Microeconomics	3	0	3
3032	Records Management	2	3	3
		18	7	20
■ Second Co-op Term				
9202	Cooperative Employment	3	40	2
■ Third School Term (June & September)				
1002	Communication Skills II	3	0	3
2926	Principles of Management	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
2903	Survey of Marketing	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
		17	10	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
1850	Computerized Business Applications	2	3	3
2912	Principles of Accounting II	3	2	3
3015	Transcription II - Gregg & C21	2	8	5
		13	13	17
■ Fifth Co-op Term				
9205	Cooperative Employment	4	40	3
				108

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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
1850 Computerized Business Applications	2	3	3
2925 Business Principles	3	0	3
3001 Typewriting I	2	3	3
3021 Office Procedures	3	0	3
	17	6	19
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
1512 Microeconomics	3	0	3
3002 Typewriting II	2	3	3
3032 Records Management	2	3	3
3050 Introduction to Word Processing I	1	4	3
	15	10	19
Second Co-op Term			
9202 Cooperative Employment	3	40	2
Third School Term (June & September)			
1002 Communication Skills II	3	0	3
2926 Principles of Management	3	0	3
1823 Business Law I	3	0	3
2905 Money & Banking	3	0	3
3003 Typewriting III	2	3	3
3022 Office Machines	2	3	3
	16	6	18
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	3	2	3
3004 Typewriting IV	2	3	3
3024 Secretarial Procedures	3	0	3
	17	5	18
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
2903 Survey of Marketing	3	0	3
2904 Office Management	3	0	3
2910 Office Accounting II	3	2	3
1712 Data Entry Systems	2	3	3
	17	5	18
Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			105

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Secretarial Technology
Word Processing 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
3021 Office Procedures	3	0	3
3050 Introduction to Word Processing I	1	4	3
	16	7	19
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
1850 Computerized Business Applications	2	3	3
3002 Typewriting II	2	3	3
3032 Records Management	2	3	3
3051 Introduction to Word Processing II	1	4	3
	14	13	19
Second Co-op Term			
9202 Cooperative Employment	3	40	2
Third School Term (June & September)			
1002 Communications Skills II	3	0	3
1512 Microeconomics	3	0	3
2926 Principles of Management	3	0	3
3003 Typewriting III	2	3	3
3023 Machine Transcription	3	0	3
3052 Text Management	1	4	3
	15	7	18
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
2903 Survey of Marketing	3	0	3
2911 Principles of Accounting I	3	2	3
3053 Transcription Text Editing I	1	4	3
3056 Document Handling Controls	1	4	3
	14	10	18
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
1823 Business Law I	3	0	3
2904 Office Management	3	0	3
2912 Principles of Accounting II	3	2	3
3054 Transcription Text Editing II	1	4	3
3057 Text Administration	1	4	3
	17	10	21
Fifth Co-op Term			
9205 Cooperative Employment	4	40	3
			108

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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. Stu-

dents 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. Students with prior work experience who wish to apply for advance standing co-op credits should contact their advisor during their first term at the College.*

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 admissions 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' course work 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, 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.

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 & Trigonometry 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
15xx Social Science 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

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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.

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
15xx	Social Science 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
11xx	Mathematics	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
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
		48	71	61

Powerplant Certificate Curriculum

		Hours Per Week Class	Lab	Credit Hours
11xx	Mathematics	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
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
		58	49	62

Biomedical Electronics Engineering Technology

The Biomedical Electronics 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 Electronics 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
4011	General Anatomy	2	3	3
7720	A.C. Circuits Analysis	6	3	5
7728	Introduction to Digital Concepts	3	2	3
		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
7738	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
15xx	Social Science Elective	3	0	3
7748	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
7768	Digital Systems III	3	4	4
+7759	Biomedical Instrumentation II	4	2	4
		17	8	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.

+Offered in late afternoon or evening.

Recommended Technical Electives

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

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 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.

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 Graphics 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
15xx	Social Science 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
15xx	Social Science 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	3	2	3
7955	Soils Engineering	2	3	3
		16	9	18
■ Fifth Co-op Term				
9405	Cooperative Employment	1	40	3
				109

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Electronics Engineering Technology

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.

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
7008 Basic Engineering Drawing	2	4	3
7720 A.C. Circuits Analysis	6	3	5
7728 Introduction to Digital Concepts	3	2	3
	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
2292 Physics II - Mechanics & Heat	3	2	3
7730 Electronics I	6	3	5
7738 Digital Systems I	3	3	4
	19	8	19
■ Third Co-op Term			
9403 Cooperative Employment	1	40	3
■ Fourth School Term (November & January)			
2293 Physics III - Electromagnetic Waves	3	2	3
7740 Electronics II	4	2	4
7743 Communications Systems I	4	2	4
7748 Digital Systems II	3	3	4
1020 Effective Speaking	3	0	3
	17	9	18
■ 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
15xx Social Science Elective	3	0	3
7750 Electronics III	4	2	4
7768 Digital Systems III	3	3	4
7xxx 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
15xx Social Science Elective	3	0	3
7755 Electrical Estimating	2	3	3
7756 Power Generation & Transmission	3	1	3
7757 Electrical Preventive Maintenance	3	2	3
7xxx Technical Elective			3
			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.

Recommended Technical Electives
2294 Physics IV - Atomic and Nuclear
1194 Differential & Integral Calculus
7501 HVAC Plant Maintenance
7140 Strength of Materials
7135 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.

The Electro-Mechanical 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
7728 Introduction to Digital Concepts	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)			
2292 Physics II - Mechanics & Heat	3	2	3
1193 Functions & Introduction to Calculus	4	0	4
7135 Fluid Power Systems	4	4	4
7738 Digital Systems I	3	3	4
7732 Industrial Control Electronics	6	3	5
	20	12	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
1021 Human Relations	3	0	3
	20	10	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
71xx Technical Elective			3
15xx Social Science Elective	3	0	3
7157 Electro-Mechanical Controls II (Microprocessors Applications)	3	3	4
7758 Industrial Motors & Controls	3	2	3
	15	5	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)
7142 Mechanisms Analysis
7150 Machine Design
7010 Engineering Drawing
7149 Computer Applications (CNC-NC)

Manufacturing Engineering Technology

Of the many engineering technologies, Manufacturing Engineering Technology 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.

The program provides study and practice in the operation of machines in manufacturing. Routing techniques with respect to tooling, fixtures, machine utilization and sequence of operations are covered with emphasis on design for cost and ease of operation. Materials are included as to their applications in strength, weldability, and ease of operation, as well as cost factors involved in the final design.

Plastics Processes — Although no discreet curriculum exists in the area of plastics, various technical courses specifically applicable to plastics processes are available to interested students. These courses are identified following the Manufacturing Curriculum and can be used to satisfy the technical elective credits identified within the curriculum.

Industrial Engineering Technology — No discreet curriculum exists in this discipline at this time. However, numerous technical courses which are specifically applicable to this area are available to students whose interests lie in such areas as time analysis, work measurement, production control, wage and job evaluation, materials handling, and plant layout.These courses are identified following the Manufacturing Curriculum and can be used to satisfy the technical elective credits within the curriculum.

Students interested in satisfying their technical electives within the two above-mentioned areas should consult with their program coordinator/advisor because of prerequisite requirements, etc. It should be noted that these courses will usually be offered in late afternooon or during the evening hours throughout the year or on a course by demand basis. As per Division policy, the degree awarded will be in the discipline of Manufacturing Engineering Technology with the transcript reflecting a concentration of Plastics Processes or Industrial Engineering Technology courses as per the student's interest.

Manufacturing 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
7000 Engineering Tech Orientation	1	0	1
7010 Engineering Drawing I	2	4	3
7104 Machine Tools & Manufacturing Processes OR	3	3	3
7811 Welding Processes & Techniques I	3	3	3
7111 Engineering Materials	3	2	3
1021 Human Relations	3	0	3
	19	9	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
7104 Machine Tools & Manufacturing Processes OR	3	3	3
7811 Welding Processes & Techniques I	3	3	3
7030 Computer Programming (Basic)	2	2	3
7301 Introduction to Plastic Processes	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
2292 Physics II - Mechanics & Heat	3	2	3
7132 Hydraulics & Pneumatics I	3	2	3
7441 Quality Control	3	2	3
7xxx 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	3	2	3
7xxx 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
15xx Social Science Elective	3	0	3
7151 Tool Engineering Design	3	3	3
7149 Computer Applications (CNC-NC)	3	2	3
7159 Manufacturing Methods & Cost Control	3	2	3
7xxx Technical Elective			3
			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.

Recommended Technical Electives

Plastics Processes
7310 Plastic Processes — Compression & Transfer
7311 Plastics Processes — Thermoforming Methods
7315 Fiber Reinforced Plastics, Laminates & Castings
7320 Plastics Processes — Injection, Extrusion
7342 Product, Mold & Tool Design

Industrial Engineering Technology
7409 Industrial Safety & OSHA
7410 Materials Handling
7430 Time & Motion Study
7440 Industrial Processes & Plant Layout
7452 Industrial Hygiene Measurements

Other Recommended Technical Electives
7040 Industrial Supervision & Management
7017 Steel Fabrication (Graphics)
7142 Mechanism Analysis
7150 Machine Design
7152 Hydraulics & Pneumatics II
7160 Microprocessor Interfacing
7821 Fabrication Process & Techniques I

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 I	2	4	3
7111 Engineering Materials	3	2	3
7013 Descriptive Geometry	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
7121 Metallurgy of Materials	3	2	3
7012 Engineering Drawing II	2	4	3
	18	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
7030 Computer Programming (Basic)	2	2	3
7140 Strength of Materials	4	2	4
7142 Mechanisms Analysis	3	2	3
1010 Effective Speaking	3	0	3
	19	6	20
■ Third Co-op Term			
9403 Cooperative Employment	1	40	3
■ Fourth School Term (November & January)			
1021 Human Relations	3	0	3
2293 Physics III - Electromagnetic Wave	3	2	3
7135 Fluid Power Systems	4	4	4
7150 Machine Design	4	2	4
7708 Electrical Fundamentals & Controls	4	2	4
	18	10	18
■ Fourth Co-op Term			
9404 Cooperative Employment	1	40	3
■ Fifth School Term (April & June)			
1010 Technical Writing	3	0	3
15xx Social Science 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
7xxx 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

1194 Differential & Integral Calculus
2294 Physics IV - Atomic & Nuclear
7031 Computer Programming (Fortran)
7040 Industrial Supervision & Management
7154 Numerical Control Compact II

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 is awarded a Certificate of Completion. 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
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
1172 Technical Mathematics II	4	0	4
15xx Social Science 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
10xx 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
			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 Elective

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
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
1192 Algebra & Trigonometry II	4	0	4
15xx Social Science 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
10xx Communication Skills Elective	3	0	3
2292 Physics II - Mechanics & Heat	3	2	3
7012 Engineering Graphics III	2	4	3
7140 Strength of Materials	4	2	4
7xxx Technical Elective			3
7708 Electrical Fundamentals & Controls	4	2	4
			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

Machine Tool & Processes Certificate Curriculum

	Hours Per Week Class	Lab	Credit Hours
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
1192	Algebra & Trigonometry II	4	0	4
15xx	Social Science 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
10xx	Communication Skills Elective	3	0	3
7040	Industrial Management & Supervision	3	0	3
7149	Computer Applications (CNC & NC)	2	2	3
7708	Electrical Fundamentals & Controls	4	2	4
7159	Manufacturing Methods & Cost Control	3	2	3
7xxx	Technical Elective			3
				55

*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 Maintenance Certificate Curriculum

		Hours Per Week Class	Lab	Credit Hours
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
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
7xxx	Technical Elective			3
10xx	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
7xxx	Technical Elective			3
7735	Elements of Power Electronics	3	2	3
				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 course 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 & 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 proud 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

CTC's Laser/Optics program is the first of its kind in Ohio and one of the few associate degree programs in laser technology in the country. The curriculum includes the technical aspects of laser theory and application.

Laser/Optics Technology Curriculum

Prerequisites: algebra & geometry	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
15xx Social Science Elective	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			
1021 Human Relations	3	0	3
7030 Computer Programming (Basic)	3	2	3
6740 Laser-Optics IV	3	3	5
7740 Electronics II	4	2	4
xxxx Elective	3	2	
	16	9	15
■ Eighth Term			
9404 Cooperative Employment	1	40	3
■ Ninth Term			
1010 Technical Writing	3	0	3
15xx Social Science Elective	3	0	3
6750 Laser-Optics V	3	3	5
7750 Electronics III	4	2	4
xxxx Elective	3	2	
	16	7	15
■ Tenth Term			
9405 Cooperative Employment	1	40	3
			103

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

Recommended Electives with advisor's permission
1133 Basic II for Science & Eng. Technologies
1194 Differential & Integral Calculus
1195 Differential Equations
2294 Physics IV - Atomic & Nuclear
6999 Laser-Optic Project
7031 Computer Programming (Fortran)
4011 General Anatomy
6741 Fiber Optics
7103 Machine Processes I
7728 Introduction to Digital Concepts
7738 Digital Systems I
7748 Digital Systems II
4501 Introduction to Surgery

Technical Laboratory Careers - Scientific Measurement and Testing Technology

Scientific Measurement and Testing Technology is Ohio's first associate degree program in the area of technical laboratory education and training. Classroom and laboratory instruction normally combined with co-op employment gives students both theory of and experience with mechanical, electrical, chemical, optical and thermal systems as they apply to the measurement and testing of materials.

Scientific Measurement & Testing Technology Curriculum

Prerequisites: algebra & geometry	Hours Per Week Class	Lab	Credit Hours
■ First Term			
1002 Communication Skills II	3	0	3

*1191 Algebra & Trigonometry I	4	0	4
15xx Social Science 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	1	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 Chemistry II	3	3	4
6629 Science of Materials	3	2	4
	16	7	18

■ Fourth Term

9402 Cooperative Employment	1	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	1	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
7030 Computer Programming (Basic)	2	2	3
7441 Quality Control	3	2	3
	15	8	18

■ Eighth Term

9404 Cooperative Employment	1	40	3

■ Ninth Term

1020 Effective Speaking	3	0	3
1194 Differential & Integral Calculus	4	0	4
15xx Social Science Elective	3	0	3
15xx Social Science Elective	3	0	3
6659 Analysis of Materials Project	3	4	5
7xxx Technical Elective	3	2	3
	19	6	21

■ Tenth Term

9405 Cooperative Employment	1	40	3
			109

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

Recommended Electives

1133 Basic II for Science & Eng. Technologies
1195 Differential Equations
2294 Physics IV - Atomic & Nuclear
6641 Technical Laboratory Chemistry IV
6661 Chemical Contamination in the Environment
6710 Laser Theory I
7031 Computer Programming (Fortran)
7132 Hydraulics & Pneumatics I
7145 Statics & Strength of Materials
7710 D.C. Circuit Analysis
7720 A.C. Circuit Analysis
7730 Electronics I
7728 Introduction to Digital Concepts
7740 Electronics II

Associate of Individualized Study

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.

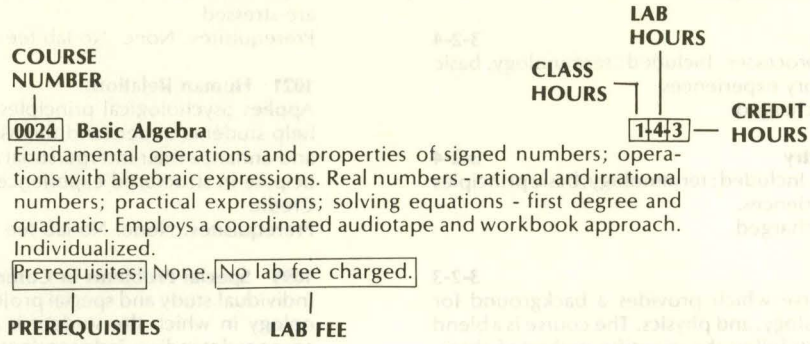
COURSE DESCRIPTIONS

CATALOG/HANDBOOK 82-83

COURSE DESCRIPTIONS

CATALOG\HANDBOOK 82-83

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**
Mathematics at the developmental level. Individualized instruction and practice in the fundamental skills of mathematics. Uses audio tapes and coordinated text. Assignments for each student as determined by diagnostic test. Topics available: whole numbers; primes, composites, and factoring; common fractions; decimals; percent. Additional topics: reinforcement of basic computations; math applications.
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.

0026 Fundamentals of Business Mathematics **1-4-3**
Structure of the number system with business applications. Whole numbers, equations, fractions, decimals, percent, percentage, ratio,

proportion, measurements (U.S. and metric), measures of central tendency. Individualized with audio tapes, text and film strips.
Prerequisites: None. 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.

0035 General Science **3-2-3**
An introductory science course which provides a background for future studies in chemistry, biology, and physics. The course is a blend of content and process; students follow the scientific method of observation, hypothesis, demonstrations and activities, and testing.
Prerequisites: None. No lab fee charged.

0036 Basic Concepts of Medical Terminology **3-2-3**
Course will provide an introduction to major medical word parts. This will include word roots, prefixes and suffixes. Emphasis will be placed on medical word building, compounding medical word parts and special emphasis on saying, listening to and spelling words as an aid to study procedures.
Prerequisites: None. No 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 and usage.
Prerequisites: None. No lab fee charged.

1002 Communication Skills II **3-0-3**
The composition of a theme; 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 effective 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 59.
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, mark 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 59.
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 2 for Science and Engineering Technologies **2-2-3**
An intermediate course in the use of the computer in science and engineering technologies. Computation techniques including various mathematical algorithms, use of files and simple graphics are introduced and applied. Basic language is used.
Prerequisites: 1192, 7030. 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.

1135 Business Calculus **4-0-4**
Introductory calculus with applications in business decisions and probability theory. Develop skill in finding derivatives and integrals.
Prerequisites: None. No 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 59.
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 Mathmatics **4-0-4**
Fundamental skills of mathematics as applied to the 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 59.
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.
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.
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: 1191, 1192. No lab fee charged.

1194 Differential and Integral Calculus **4-0-4**
Derivatives, differentials, integrals, techniques of integration, volumes. Introduction to differential equations. 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: 1191, 1192, 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 and 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 to 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 typesetting - 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: 1402. Lab fee charged.

1415 Graphic Arts Processes 2-3-3
Development and evaluation of printing devices. Graphic art processes in use today: letterpress, gravure, flexographic, offset and screen printing. How they work, and the kinds of work for which they were designed. Hands on training of offset duplicator and electrostatic plates will be covered in laboratory.
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 text - 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, comsumption, 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 COPE, 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 **4-6-6**
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. Fundamentals 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: 2000. 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 Co-ordinator 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 should be tested in advance of registration for basic math competency and if there is a need, suggested corequisite math courses are available.)
Corequisites: 1150 or 1170 (Competency test may waive.) 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.

245 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) **3-2-4**
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) **2-3-3**
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 **2-8-5**
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 **2-8-5**
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 gauges. 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.

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 **3-0-3**
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 **3-0-3**
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.

2903 Survey of Marketing **3-0-3**
An introductory course that covers the basic principles of marketing. This course is designed to provide a fundamental understanding of the economic and social forces which influence the marketing process.
Prerequisites: None. 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 **3-2-3**
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: 2926. 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 management 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 brokers 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 **2-8-5**
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 **2-8-5**
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 **3-2-3**
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, machine transcription equipment, and word processing equipment. Machines included are Dictaphone transcribers, QYX's, MTST's, Memories, Composer, printing and display calculators, mimeograph 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 **2-3-3**
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 secretarial coordinator. No lab fee charged.

3048 Word Processing Operations I **1-4-3**
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 Advanced Text Management System display terminal. This course is not to be taken for credit by students seeking a degree in the Word Processing technology.
Prerequisites: 3001. No lab fee charged.

3049 Word Processing Operations II **1-4-3**
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. This course is not to be taken for credit by students seeking a degree in the Word Processing Technology.
Prerequisites: 3048. No lab fee charged.

3050 Introduction to Word Processing I **1-4-3**
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 Advanced Text Management System display terminal. Course will also include exercises to enhance the training.
Prerequisites: 3001. Lab fee charged.

3051 Introduction to Word Processing II **1-4-3**
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. Lab fee charged.

3052 Text Management I **1-4-3**
An introduction to the Advanced Text Management System-III (ATMS). 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. Lab fee charged.

3053 Transcription & Text Editing I **1-4-3**
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. Lab fee charged.

3054 Transcription & Text Editing II **1-4-3**
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 commands 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, 3056. 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.

3056 Document Handling Controls **1-4-3**
Students will be instructed with the use of structured exercises to enhance the specialized processing applications of word processing and document handling controls. These exercises will feature such aspects as management of text, editing and retrieval systems, transferring of documents from working to permanent storage and special manipulation functions.
Prerequisites: 3052. Lab fee charged.

3057 Text Administration **1-4-3**
The role of the Text Administrator and/or Supervisor of Word Processing will be explored. Office simulations and special projects will enhance the various duties and functions of text administration. Case studies and the psychological aspects of supervision of automated offices will, from a secretarial standpoint, be discussed.
Prerequisites: 3053, 3056. 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 Equipment **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 nar-

row-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, styles, principles, 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 Floriculture 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 topics 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: 4011, 4012 or permission of instructor. 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: 4011, 4012 or permission of instructor. 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 principles 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.

4107 Diet Therapy **4-0-4**
A continuation of Nutrition in Disease with an increased emphasis on application of diet therapy principles. Course includes a study of the pathological states and nutritional involvement of cardiovascular and renal disease, GI disorders, cancer, allergies and rehabilitative medicine.
Prerequisites: 4106. No lab fee charged.

4109 Dietetics Seminar **2-0-2**
Comprehensive examination of nutrition care knowledge. Evaluation of field experiences, job trends and opportunities, community resources and professional organizations.
Prerequisites: Completion of all Dietetic Technician Courses or in final term of the Dietetics Program. No lab fee charged.

4111 Dietetics Orientation and Directed Practice I **1-3-1**
Orientation to the field of nutrition and dietetics, its roles, mission and relationship to the health care team. The role of the Dietetic Technician as a paraprofessional in the dietetics field is specifically explored. Directed practice component includes field trips, role playing sessions, guest speakers, etc.
Prerequisites: None. No lab fee charged.

4112 Dietetics Directed Practice II **0-6-1**
Nutrition care rotation in a health care facility parallel to didactics covered in Normal Nutrition.
Prerequisites: 4102, 4111. No lab fee charged.

4113 Dietetics Directed Practice III **0-8-1**
Nutrition care rotation in a health care facility parallel to didactics covered in Nutrition in Human Growth & Development.
Prerequisites: 4112. Corequisites: 4105. No lab fee charged.

4114 Dietetics Directed Practice IV **0-10-2**
Nutrition care rotation in a health care facility parallel to didactics covered in Nutrition in Disease.
Prerequisites: 4113. Corequisites: 4106. No lab fee charged.

4115 Dietetics Directed Practive V **10-0-2**
Nutrition care rotation in a health care facility parallel to didactics covered in Diet Therapy.
Prerequisites: 4114. Corequisites: 4107. No lab fee charged.

4116 Dietetics Directed Practice VI **0-8-1**
Nutrition care rotation in a health care facility parallel to didactics covered in Dietetics Seminar.
Prerequisites: 4115. Corequisites: 4109. No lab fee charged.

4120 Nutrition and Food Preparation **2-6-4**
The fundamentals of food preparation including small and large equipment utilization, energy sources and food composition in relation to nutritional value. Laboratory includes the preparation and evaluation of all food groups according to appropriate procedures.
Prerequisites: 4130 or permission of instructor. Lab fee charged.

4121 Meal Management **3-0-3**
Principles of menu planning and presentation for various age and societal groups. A study of food economics including major economic indicators, marketing trends and purchasing techniques. Course 4103 is recommended as a prerequisite to this course.
Prerequisites: None. Lab fee charged.

4122 Food Service Management I **3-3-4**
Introduction to institutional food service systems including layout and equipment menu planning and costing, recipe standardization, product testing, purchasing flow patterns, time management, job procedure writing and analysis, safety and sanitation.
Prerequisites: 4120. Lab fee charged.

4123 Food Service Management II **3-3-4**
Continuation of 4122 with emphasis on management skills, including work schedules, job descriptions, inventory control, and evaluation of food service operations and employees. Laboratory includes the implementation and complete operation of a small food service delivery system with cycle regular and modified menus.
Prerequisites: 4122. Lab fee charged.

4130 Introduction to Nutrition **3-0-3**
An introduction to nutrition for students with a minimal science background. Course includes basic nutrient composition, food sources, food legislation, foodborne illnesses, menu planning and relationship of diet to health and disease.
Prerequisites: None. No lab fee charged.

4131 Developmental Nutrition **4-0-4**
Nutritional science and its effect on human physiology with application to all population groups. Nutrient composition, digestion absorption and metabolism for normal and diseased states are studied. Didactics accompanied by practical application to developmental life stages.
Prerequisites: 4005 or high school chemistry. No lab fee charged.

4190 Dietetic Assistant Education I **3-4-4**
An introduction to the health field as it effects the dietetic professions and practices. An overview of normal nutrition including the nutrient groups, food sources, functions and deficiency symptoms, and the

eating patterns of various age and ethnic groups. Directed Practice parallels course didactics.
Prerequisites: None. No lab fee charged.

4191 Dietetic Assistant Education II **3-4-4**
Menu writing for various groups, implementation of elementary diet therapy rationale and procedures. Sanitation, safety and disaster planning. Directed Practice parallels course didactics.
Prerequisites: 4190. No lab fee charged.

4192 Dietetic Assistant Education III **3-4-4**
Food mathematics as it relates to food preparation, portion control and cost control. Preparation of all major categories of food. Food systems. Directed Practice parallels course didactics.
Prerequisites: 4191. No lab fee charged.

4193 Dietetic Assistant Education IV **3-4-4**
Records for food purchasing, inventory control, employment and evaluations. Supervisory techniques and problem solving. Directed Practice parallels course didactics.
Prerequisites: 4192. No lab fee charged.

4194 Workshops in Dietetics **3-0-3**
Consideration and study of selected issues and topics in the dietetics area designed to meet current needs. Content and emphasis varies from year to year.
Prerequisites: None. No lab fee charged.

4195 Dietetic Assistant Education V **3-4-4**
Growth and development through the life cycle, including nutritional, physical, psychological and social development needs of all age groups. Consumer economics as it applies to assessment and implementation of family food purchasing, storage and preparation techniques. (Directed Practice parallels course didactics).
Prerequisites: 4190 and 4191. No lab fee charged.

4196 Dietetic Assistant Education VI **3-4-4**
Principles of interviewing to obtain specific nutritional assessment data from consumers or patients. Simple dietary analysis and recommendations, using standard formats and terminology. Principles needed for the presentation of consumer nutritional programs including demonstration and evaluation techniques. (Directed Practice parallels course didactics).
Prerequisites: 4190 and 4191. No lab fee charged.

4199 Special Studies — Dietetics **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.

4199 Special Studies - Dietetics **Var-Var-Var**
A student initiated academic pursuits, 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.

4201 Medical Office Practice **2-8-4**
Fundamentals of patient reception, appointment making, mail handling, telephone techniques, inventory procedures, care of equipment and supplies, medical-legal relationships of the medical office and the assistant's responsibility.
Prerequisites: None. Lab fee charged.

4202 Clinical Assisting I **2-8-4**
Fundamentals of patient preparation, history taking, positioning, draping, taking and recording the vital signs, assisting the physician with the examinations, caring for the physician's bag, caring for the examination room before and after a patient.
Prerequisites: None. Lab fee charged.

4203 Clinical Assisting II **2-8-4**
Fundamentals of preparing and administering medications, assisting the specialists, patient preparation for the specialty examination, basic first aid for the medical office, sterilization techniques and methods.
Prerequisites: 4202. Lab fee charged.

4204 Medical Procedures I **2-8-4**
Study of medical laboratory procedures for the medical office - including specimen collection, basic hematology procedures, pregnancy testing, culturing techniques, urinalysis, sickle cell testing, x-ray procedures, basic EKG procedures.
Prerequisites: 4005. Lab fee charged.

4205 Medical Procedures II **2-8-4**
Continuation of Medical Procedures I, with emphasis on differentials, WBC, RBC, urine microscopics, chemistry procedures, coagulation testing, vision and hearing testing, EKG interpretation, blood grouping and rh typing, serological procedures, ova and parasites, ultra sound and diathermy, basic pulmonary studies, other patient diagnostic tests and employee health programs.
Prerequisites: 4204. Lab fee charged.

4208 Insurance and Patient Records **2-2-3**
Fundamental principles of initiating, maintaining, keeping patient records in the doctor's office; filing and indexing of records; retention of records; private, government and group insurance programs; completion of insurance forms.
Prerequisites: None. Lab fee charged.

4209 Medical Assistant Seminar **0-5-2**
Preparation of the student for the certification examination. Topics to be presented by the students enrolled in the class. Students hold clinics for practical experience in the performance of procedures learned during previous Medical Assisting courses.
Prerequisites: Students who take this course must be in their last term of Medical Assisting Program. No lab fee charged.

4211 Medical Assisting Clinical Experience I **0-20-3**
Clinical practice in the physician's office, health centers and clinics, hospital out-patient departments, performing functions related to medical assisting. The student will spend an equal number of hours in clinical and administrative assisting. Students will not receive renumeration for these experiences.
Prerequisites: None. No lab fee charged.

4212 Medical Assisting Clinical Experience II **0-20-3**
Clinical practice in the physician's office, health centers and clinics, hospital out-patient departments, performing functions related to medical assisting. The student will spend an equal number of hours in clinical and administrative assisting. Students will not receive renumeration for these experiences.
Prerequisites: None. No lab fee charged.

4213 Medical Assisting Clincal Experiences III **0-20-3**
Clinical practice in the physician's office, health centers and clinics, hospital out-patient departments, performing functions related to medical assisting. The student will spend an equal number of hours in clinical and administrative assisting. Students will not receive renumeration for these experiences.
Prerequisites: None. No lab fee charged.

4290 Basic Electrocardiography **5-0-5**
Introduction to principles of electrocardiography. Designed to acquaint the participants with taking the EKG, patient preparation, mounting and filing, cardiac anatomy and electrophysiology, recognizing and correcting distortion problems and special patients and problems with the EKG. Practical experience in taking the EKG included.
Prerequisites: None. Lab fee charged.

4291 Electrocardiogram Interpretation **3-0-3**
Advanced course in electrocardiography with emphasis on recognizing arrhythmias. Review of basic EKG principles and cardiac anatomy. Emphasis on measurement and calculation of EKG patterns for determining variations in heart patterns (Dysrhythmias).
Prerequisites: Basic EKG 4290 or experience. No lab fee charged.

4294 Workshops in Medical Assisting **3-0-3**
Consideration and study of selected issues and topics in the medical assisting area designed to meet current needs. Content and emphasis varies from year to year.
Prerequisites: None. No lab fee charged.

4299 Special Studies - Medical Assisting **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.

4301 Basic Laboratory Techniques **2-3-3**
Instruction in the use and maintenance of laboratory equipment, including the microscope, spectrophotometer and centrifuges. Discussion of laboratory safety, quality control. Instruction in basic techniques such as blood drawing and pipetting also included.
Prerequisites: None. Lab fee charged.

4302 Basic Hematology and Urinalysis **4-6-6**
Study of theory of blood cell production and routine hematologic procedures, to include the complete blood count, erythrocyte sedimentation rate, reticulocyte and platelet counts. The routine urinalysis with microscopic examination of sediment is also included.
Prerequisites: Taken concurrent with or subsequent to 4301. Lab fee charged.

4303 Immunology **3-0-3**
Discussion of the basic physiology of the immune system; study of principles of routine techniques for serological testing. Brief introduction to immune disorders and tissue transplants.
Prerequisites: None. No lab fee charged.

4304 Clinical Chemistry **4-3-5**
Study of theory and procedures of routine manual and automated chemical laboratory procedures, their quality control and use of related instrumentation.
Prerequisites: 4005 and 4301. Lab fee charged.

4305 Blood Bank — Serology **4-6-6**
A study of blood banking procedures and theory including the inheritance of blood group determinants and donor procedures. Also includes a study of serology. Performance of routine typing, crossmatching, antibody screening, cell panels and routine serologic procedures.
Prerequisites: 4301 and 4303. Lab fee charged.

4306 Clinical Microbiology **4-6-6**
Study of diagnostic microbiology including isolation, identification of bacteria, use of media, aerobic and anaerobic culturing techniques and preparation and staining of slides. Includes parasitology and mycology.
Prerequisites: 4009. Lab fee charged.

4307 Hematology II **2-3-3**
Advanced hematology including study of anemia, leukemias, hemoglobinpathies and other blood dyscrasias. Instruction in the theory of coagulation and special hematologic procedures.
Prerequisites: 4302 and 4311. Lab fee charged.

4308 Special Laboratory Procedures **1-3-2**
Discussion of special laboratory procedures from the various areas, to include RIA, parasitology, mycology, spinalfluids, etc.
Prerequisites: Completion of all MLT courses. Lab fee charged.

4309 Medical Laboratory Seminar **3-0-3**
Review of the various departments of the clinical laboratory, includes a registry type comprehensive examination.
Prerequisites: Completion of all MLT courses. No lab fee charged.

4311 Clinical Applications I — Hematology & Urinalysis **0-6-2**
Laboratory practice in routine hematology and urinalysis. The practicum will stress workload organization, record keeping, quality control, routine maintenance and troubleshooting of related instrumentations.
Prerequisites: Concurrent with or subsequent to 4302. Lab fee charged.

4312 Clinical Applications II — Clinical Chemistry **0-6-2**
Laboratory experience in performance of routine manual and automated procedures in clinical chemistry. Emphasis on workload organization, record keeping, quality control, routine maintenance and troubleshooting for related instrumentation.
Prerequisites: Concurrent with or subsequent to 4304. Lab fee charged.

4313 Clinical Applications III — Blood Bank — Serology **0-6-2**
Laboratory practice in routine Blood Banking and Serology. The practicum will stress workload organization, record keeping and quality control.
Prerequisites: Concurrent with or subsequent to 4305. Lab fee charged.

4314 Clinical Applications IV — Clinical Microbiology **0-6-2**
Practical experience in routine clinical microbiology procedures. The practicum will stress workload organization, record keeping and quality control applied to the Microbiology lab.
Prerequisites: Concurrent with or subsequent to 4306. Lab fee charged.

4351 Clinical Experience I **1-24-4**
Students are assigned to the clinical laboratory where previously learned theories and procedures are applied in a patient-oriented atmosphere. Students are required to complete a minimum of 240 hours. This may necessitate makeup work to accommodate the scheduled holidays of the college. Students also attend seminar activities on campus, relating to the clinical experience.
Prerequisites: 4311. No lab fee charged.

4352 Clinical Experience II **1-24-4**
Students are assigned to the clinical laboratory where previously learned theories and procedures are applied in a patient-oriented atmosphere. Students are required to complete a minimum of 240 hours. This may necessitate makeup work to accommodate the scheduled holidays of the college. Students also attend seminar activities on campus, relating to the clinical experience.
Prerequisites: 4312. No lab fee charged.

4390 Basic Phlebotomy **5-1-5**
This course introduces the student to blood drawing. Topics include terminology, anatomy and physiology appropriate to phlebotomy; techniques of vein puncture and capillary sampling; professional responsibilities. Ten hours of practice with techniques.
Prerequisites: None. No lab fee charged.

4391 Phlebotomy Practicum I **0-5-1**
Placement in a local clinical facility for practice in blood drawing techniques on adults. Optional pediatric experience available.
Prerequisites: 4390. No lab fee charged.

4394 Interpretation of Laboratory Values **3-0-3**
Course 4394 will present many of the clinical laboratory tests. How samples are collected and analyzed will be outlined. Also discussed will be how the results are reported and what they may mean clinically to the health professional.
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 communica-

ble 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 will discuss the gradual evolution of modern day surgery, orient the student to the organization and structure of the operating room department and also introduce the student to the roles and functions of OR personnel. The care and sterilization of equipment, care and preparation of the operative patient, sutures/needles, basic instruments, anesthesia and wound healing are included.
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. 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**
Introduction to basic OR skills including aseptic techniques, OR attire, scrubbing, gowning, gloving, opening sterile packs and sterilization of OR supplies. The course involves supervised practice of OR skills in a practice lab on campus and in the operating rooms of an affiliated hospital.
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 **0-10-2**
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.

4521 Surgical Technology Clinical Practice I **1-40-7**
Students are assigned to the operating room of a hospital currently affiliated with the program. The student is supervised by an adjunct faculty member and program coordinator. Students also attend a one-hour weekly seminar on campus relating to the field experience.
Prerequisites: Permission of instructor. No lab fee charged.

4522 Surgical Technology Clinical Practice II **1-40-7**
Continuation of 4521 accompanied 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 **2-2-3**
Fundamentals of OR Nursing is an introductory course for registered nurses and student nurses. The course will provide the student with a broader view of nursing care of the surgical patient. Application of the nursing process and medical-surgical concepts are incorporated into the care of the operating room patient. Course content includes an introduction to the perioperative role, discussion of the OR environment, patient preparation, sterilization, anesthesia, OR drugs, and supplies such as sutures, needles and instruments. Lab experience in scrubbing, gowning/gloving, positioning, and table set up are included. The course can be utilized by hospitals as an adjunct inservice course for registered nurses or as an elective course for student nurses prior to their OR experience.
Prerequisites: Registered nurses. 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, O_2 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, 4702. No lab fee charged.

4713 Respiratory Therapy Clinical Practice III **0-30-5**
A continuation of 4712. Neonatal applications are also treated.
Prerequisites: 4712, 4703. 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, 4704. No lab fee charged.

4715 Respiratory Therapy 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.

4718 Pulmonary Diseases I **2-0-2**
In depth study of pulmonary disease, including pathophysiology, diagnosis and treatment. Emphasis placed on the role of respiratory therapy in the management of patients with pulmonary disease.
Prerequisites: 4702. No lab fee charged.

4719 Pulmonary Diseases II **2-0-2**
Continuation of 4718.
Prerequisites: 4718. 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 technician. 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 studied 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 possibly 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, 6629, 6621. Lab fee charged.

6659 Analysis of Materials Project **3-4-5**
An application of measurement and testing technology to the conception, development, design and completion of an approved project to include the recording, compilation and reporting of projects data.
Prerequisites: 6649, 6631, 1179. 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 **0-0-1-5**
Individual study and/or special project assigned in student's 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**
A beginning course which covers the techniques and functions of drafting. Use of technical terms, equipment, lettering and basic line quality. Includes orthographic, isometric and oblique projection, sections, the basic concepts of dimensioning, and auxiliary view drawing. Also an overview of screws, threads, fasteners, intersections, developments and working drawings.
Prerequisites: None. Corequisites: 1171. 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. Lab fee charged.

7010 Engineering Drawing I **2-4-3**
Immediate work in advanced auxiliary, section, and dimension problems. Concepts of tolerancing based on the National Standards of Dimensioning practices. Included also are screws, threads, springs fasteners and castings and an Introduction with application to assembly drawing with associated details.
Prerequisites: 7008 or equivalent. Corequisites: 1191. Lab fee charged.

7012 Engineering Drawing II **2-4-3**
Continuation of Engineering Drawing I. Emphasis is on advanced working drawings with specific applications to Machine Assembly and detail drawings utilyzing references for dimensions tolerancing and material selection.
Prerequisites: 1191, 7010. Corequisites: 7121. 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: 7008. 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: 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, boundary plats and topographic maps.
Prerequisites: 7910, 7024. 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 Engineering design calculations, automatic control, design optimization, quality control and Engineering 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 Engineering design calculations, automatic control, design optimization, quality control and Engineering 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.

7099 Special Studies - Engineering Technologies **Var-Var-1-6**
Special studies which may occur on an individual basis to provide a student the opportunity to work on special technical topics in the field of Engineering Technologies. This course may be substituted for Technical Elective credits.
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.
Prerequisites: 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. 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. 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**
A continuation of Machine Processes I - 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: 1192, 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 pneumatic symbols and circuitry. A comprehensive study in the fundamental concepts of servo-hydraulics, air logic and control systems.
Prerequisites: 1191. 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 (Servomechanisms) **3-4-4**
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 fixture 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. Lab fee charged.

7153 Processing Engineering III **3-2-3**
Study of thermal applications to process. Use of thermocouples, etc. Heat to controlling or producing a product.
Prerequisites: 7143 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. 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. 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: 7731, 7146. Lab fee charged.

7157 Electro-Mechanical Controls II (Microprocessor Applications) **3-3-4**
Introduction to microprocessor architecture. Includes CPU, Ram Rom, Input/Output devices. Course develops of laddar diagrams as used in PC's. Included are many applications using the PC as a control device for machines and processes.
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. 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: 7402, 7830, 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 II — 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 I — 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 III — 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. Lab fee charged.

7353 Fiber Reinforced Plastics and Laminates **3-4-4**
Comprehensive review of resin systems and fiber reinforcement for use in production of FRP products. Materials and processes used to produce laminates by a variety of methods. Fabrication procedures. Comparative properties.
Prerequisites: 7111.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: None. 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: None. 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. 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. 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. 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. 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. 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. Procedures 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. 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. 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. 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: 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.

7728 Introduction to Digital Concepts **3-2-3**
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: 1191, 7708 or 7710. 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.

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 D.C. 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: None. No lab fee charged.

7738 Digital Systems I **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: 7720, 7728. 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.

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.

7748 Digital Systems II **3-3-4**
Introduction to microprocessor systems hardware: CPU, memories, I/O devices. Discussion of system timing and simple expansions. Software and system registers, instruction set, introduction to machine language programming.
Prerequisites: 7738. 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.

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: None. 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 or 7702. 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 are 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.

7768 Digital Systems III **3-4-4**
Microprocessor applications. Continuation of 7748. Emphasis on interfacing microprocessor systems to real worl tasks. Applications include parallel input/output. Digital to analog and analog to digital converters. Serial communications, and use of the microprocessor as an intelligent controller.
Prerequisites: 7748. 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. 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. 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 structural 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: 7945. Lab fee charged.

7943 Estimation and Inspection 3-2-3
It is a technical course that has 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 constructi ר 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. 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. Case 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
This course is designed to run for three 10-week quarters. It is aimed at exposure and working knowledge of all currently adopted codes in this area.
Prerequisites: None. No lab fee charged.

7981 Building and Support Codes II 3-0-3
Basic course in the reading of construction working drawings. Emphasis is placed on symbols used in the production of architectural, 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 3-0-3
This course is designed to run for one quarter. Its purpose is to examine the inspector himself, his personal traits, his training, and the techniques he must employ to properly inspect various types of construction for code compliance.
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 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. Select 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, troubleshoot, 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, troubleshoot 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, troubleshoot, 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, troubleshoot 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, troubleshoot 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, troubleshoot 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, troubleshoot and repair reciprocating carburetor systems and induction manifolds. Repair engine cooling system components. Inspect, check, troubleshoot, 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, 9303, 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/ Engineering Technologies 2-3 Credit Hours
Usually on an alternating term basis, the Engineering Technology 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. Adherence to Engineering Technologies Division co-op policies and procedures required to earn 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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CATALOG/HANDBOOK 82-83

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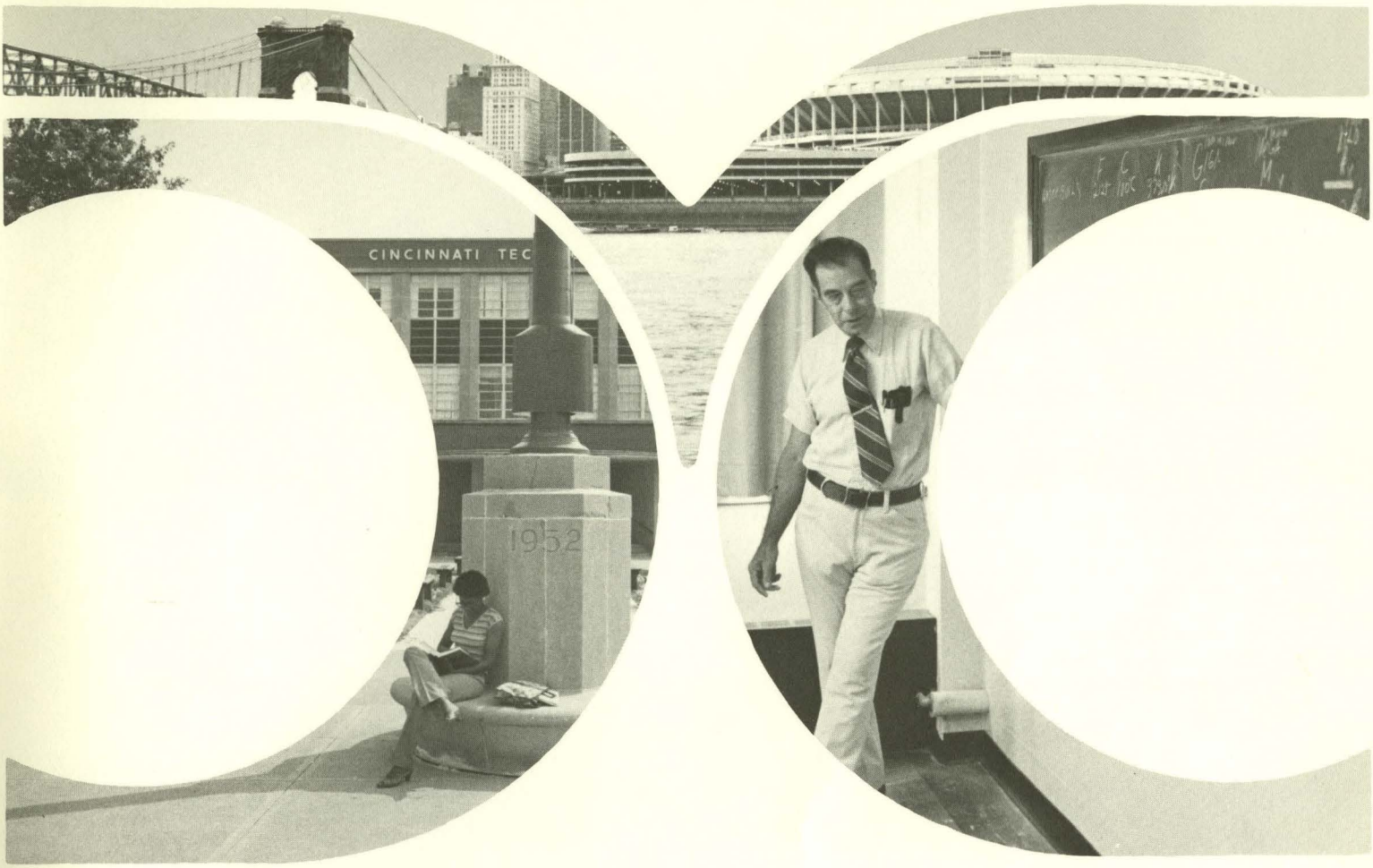

CALENDAR

CATALOG/HANDBOOK 82-83

SEPTEMBER, 1982

AUGUST 17 — PRE-REGISTRATION, BUSINESS TECHNOLOGIES DIVISION
AUGUST 18 — PRE-REGISTRATION, HEALTH TECHNOLOGIES DIVISION
AUGUST 19 — PRE-REGISTRATION, ENGINEERING TECHNOLOGIES & PHYSICAL SCIENCE/MATHEMATICS DIVISIONS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		August 31	**1** June Term Ends Registration: 8:30 a.m. - 8:30 p.m.	**2**	**3** June Term Grades Due - 4:00 p.m. No Classes/Offices Open Last day to withdraw with 100% refund—Sept. term	**4**
5	**6** Labor Day/College Closed	**7** No Classes/Offices Open	**8** September Term classes begin Registration: 8:30 a.m. - 8:30 p.m. Senior Citizens Registration June term grade reports mailed	**9** Late fee assessed for registration	**10**	**11**
12	**13**	**14** Last day to register for September term or add courses except co-op and extensions Last day to withdraw with 80% refund—September term November term pre-registration begins (ends October 8)	**15**	**16**	**17**	**18** Rosh Hashanah Admissions Test
19 Commencement	**20**	**21** Last day to register for co-op FTE reporting date Career Information Sessions (8:30 a.m. & 7:00 p.m.) Engineering Math/Science	**22** Business	**23** Pre-Business Workshop Health	**24**	**25**
26	**27** Yom Kippur	**28** Board of Trustees Meeting	**29**	**30**		

OCTOBER, 1982

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4	5	6	7	8 November term pre-registration ends	9 Admissions Test
10	11 Columbus Day	12 Last day to change "I" grades from June term	13 Bills for November term mailed	14	15 Co-op Information sheets due—September term	16
17	18	19 Career Information Sessions (8:30 a.m. & 7:00 p.m.) Health	20 Engineering Math/Science	21 Business	22	23
24 31 Halloween	25	26 Last day to withdraw with a "W" Board of Trustees Meeting	27	28	29 Distribution grade report lists—September term	30

NOVEMBER, 1982

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	**2** Election Day	**3** Bills for November term due No pays—voided pre-registration	**4**	**5**	**6**
7	**8**	**9**	**10** September term ends "IP" Course From Preceding Term Ends	**11** College Closed Veterans Day	**12** No Classes/Offices Open Last day to withdraw with 100% refund—November term	**13** I.V. Tech vs. CTC (Home 7:30 p.m.)
14	**15** November Term Classes begin Registration: 8:30 a.m. — 8:30 p.m. Senior Citizens Registration September term grades due 4:00 p.m.	**16** Late fee assessed for registration	**17** September Term grade reports mailed	**18** Queen City Classic Basketball Tournament (At CTC) Pre-Business Workshop	**19** Last day to register for November term or add courses except co-op Last day to withdraw with 80% refund — November term January term pre-registration begins (ends December 17)	**20** Admissions Test
21	**22**	**23** Board of Trustees Meeting	**24**	**25** Thanksgiving College Closed	**26** College Closed	**27**
28 CTC vs. Shawnee State (Away 4:00 p.m.)	**29**	**30** Last day to register for co-op				

Registration: 8:30 a.m. — 8:30 p.m.

Queen City Classic Basketball Tournament (At CTC) — Pre-Business Workshop

DECEMBER, 1982

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 Clark Tech vs. CTC (Home 7:30 p.m.)	**2**	**3**	**4** Thomas More J.V. vs. CTC (Home 7:30 p.m.)
5	**6**	**7** Business CTC vs. Sinclair (Away 7:00 p.m.)	**8** Health (also 7:00 p.m.)	**9** Engineering Math/Science	**10** Jayhawk Classic (Away TBA)	**11** Admissions Test Hanuka
12	**13**	**14**	**15** Southern Ohio vs. CTC (Home 7:30 p.m.)	**16**	**17** January term pre-registration ends	**18** CCC Metro vs. CTC (Home 3:00 p.m.)
19	**20** Miami U.-Hamilton vs. CTC (Home 7:30 p.m.)	**21**	**22** Bills for January term mailed	**23** Co-op Information sheets due—November term Last day to change "I" grades from September term	**24** Winter Recess Begins College Closed	**25** Christmas Day
26	**27** Offices Open	**28** Offices Open	**29** Offices Open	**30** Offices Open	**31** College Closed	

Career Information Sessions (8:30 a.m.)

Winter Recess Continues

JANUARY, 1983

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 New Year's Day
2	**3** Classes Resume CTC vs. Miami U.-Hamilton (Away 7:30 p.m.)	**4**	**5**	**6**	**7** Last day to withdraw with a "W" Distribution grade report lists November term CTC vs. Lakeland (Away 8:00 p.m.)	**8** CTC vs. CCC-Metro (Away 3:00 p.m.)
9	**10**	**11** CTC vs. Vincennes (Away 7:30 p.m.) Career Information Sessions (8:30 a.m. & 7:00 p.m.) Engineering Math/Science	**12** Bills for January term due no pays—voided pre-registration Business	**13** Health	**14**	**15** Martin Luther King's Birthday CTC vs. Owens Tech (Away 2:00 p.m.)
16	**17**	**18**	**19** Registration: 8:30 a.m. — 8:30 p.m. Shawnee State vs. CTC (Home 7:30 p.m.)	**20**	**21** "IP" courses from preceding term ends November term ends Last day to withdraw with 100% refund—January term	**22** CTC vs. Edison State (Away TBA)
23 / **30**	**24** College Closed Martin Luther King Day observed Last day to register for January term or add courses except co-op April term pre-registration begins (ends February 25) / **31** Last day to withdraw with 80% refund — January term	**25** CTC vs. Northwestern (Away 7:30 p.m.) Janurary Term begins Registration: 8:30 a.m.—8:30 p.m. Senior Citizens Registration Board of Trustees Meeting	**26** Late fee assessed for registration November term grades due—4:00 p.m.	**27**	**28** November term grade reports mailed Sinclair vs. CTC (Home 12:00 p.m.)	**29** Lakeland vs. CTC (Home 7:30 p.m.)

St. Catherine vs. CTC (Home 7:30 p.m.)

FEBRUARY, 1983

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 CTC vs. Thomas More J. V. (Away 5:30 p.m.)	**2**	**3**	**4**	**5** Admissions Test Northwestern vs. CTC (Home 7:30 p.m.)
6	**7** Last day to register for co-op Vincennes vs. CTC (Home 7:30 p.m.)	**8**	**9**	**10**	**11**	**12** Owens Tech vs. CTC (Home 2:00 p.m.)
13	**14** Valentines Day	**15** Edison State vs. CTC (Home 7:30 p.m.)	**16**	**17** CTC vs. St. Catherine (Away 7:30 p.m.)	**18**	**19** CTC vs. Ohio Valley (Away 2:00 p.m.)
20	**21** Presidents Day College Closed	**22** Career Information Sessions (8:30 a.m.) Health (also 7:00 p.m.) Board of Trustees Meeting	**23** Engineering Math/Science	**24** Business Region XII Southern Division Tournament (Away TBA)	**25** April term pre-registration ends	**26** Admissions Test
27	**28**					

MARCH, 1983

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
		1 Priority Deadline for financial aid reapplication Last day to change "I" grades from November term	**2** Bills for April term mailed	**3**	**4** Co-op Information sheets due—January term	**5**
6	**7**	**8**	**9**	**10**	**11**	**12** Admissions Test
13	**14**	**15** Last day to withdraw with a "W"	**16** Last day to apply for '82-'83 Pell Grant	**17** St. Patrick's Day	**18** Distribution grade report lists January term	**19**
20	**21**	**22** Board of Trustees Meeting	**23** Bills for April term due No pays voided pre-registration	**24**	**25**	**26**
27	**28**	**29** Passover	**30** "IP" course from preceding term ends January term ends	**31** No Classes/Offices Open		

Career Information Sessions (8:30 a.m.)

Business — Health (also 7:00 p.m.) — Engineering Math/Science

Registration: 8:30 a.m.-8:30 p.m.

APRIL, 1983

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 Good Friday College Closed	**2**
3 Easter	**4** No Classes/Offices Open January term grades due 4:00 Last day to withdraw with 100% refund—April term	**5** April term classes begin Registration: 8:30 a.m. - 8:30 p.m. Senior Citizens Registration	**6** January term grade reports mailed Late fee assessed for registration	**7**	**8**	**9**
10	**11** Last day to withdraw with 80% refund — April term Last day to register for April term or add courses except co-op June term pre-registration begins (ends May 6)	**12**	**13**	**14**	**15**	**16** Admissions Test
17	**18** Last day to register for co-op	**19**	**20**	**21**	**22**	**23**
24	**25**	**26** Board of Trustees Meeting	**27** Career Information Sessions (8:30 a.m. & 7:00 p.m.) Engineering Math/Science Business	**28** Health	**29**	**30**

MAY, 1983

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	**2**	**3**	**4**	**5**	**6** June term pre-registration ends	**7** Admissions Test
8	**9** Last day to change "I" grades from January term	**10**	**11** Bills for June term mailed	**12**	**13** Co-op Information sheets due—April term	**14**
15	**16**	**17** Career Information Sessions (8:30 a.m.) Health (also 7:00 p.m.)	**18** Engineering Math/Science	**19** Business	**20**	**21** Admissions Test
22	**23**	**24** Last day to withdraw with a "W" Board of Trustees Meeting	**25**	**26**	**27** Disrtibution grade report lists April term	**28**
29	**30** College Closed	**31**				

JUNE, 1983

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 Bills for June term due No pays - voided pre-registration	**2**	**3**	**4**
5	**6**	**7**	**8** "IP" courses from preceding term end April term ends	**9** No Classes / Offices Open	**10** Admissions Test April term grades due 4:00	**11**
12	**13** Summer Recess	**14** Summer Recess April term grade reports mailed	**15** Offices Open	**16**	**17**	**18**
19	**20** Summer Recess Continues Offices Open	**21** Summer Recess Continues Offices Open Registration: 8:30 a.m. - 8:30 p.m.	**22** Summer Recess Continues Offices Open	**23**	**24** Admissions Test	**25**
26	**27** Summer Recess Offices Open Last day to withdraw with 100% refund — June term	**28** June term classes begin Registration: 8:30 a.m. - 8:30 p.m. Senior Citizens Registration Board of Trustees Meeting	**29** Late fee assessed for registration	**30**		

JULY, 1983

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4 Independence Day College Closed	5 Last day to register for June term or add courses except co-op Last day to withdraw with 80% refund — June term	6	7	8 Admissions Test	9
10	11	12	13 Career Information Session All Technologies (8:30 a.m.)	14	15	16
17	18	19	20	21	22 Admissions Test	23
24 31	25	26	27	28	29	30

AUGUST, 1983

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5 Admissions Test	6
7	8	9	10	11	12	13
14	15	16 Last day to withdraw with a "W"	17	18	19 Distribution grade report lists — June term	20
21	22	23 Board of Trustees Meeting	24	25	26	27
28	29	30	31 "IP" course from preceding term end June term ends			

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