

1982

Center for Science and Engineering 1982-83 Bulletin

Nova Southeastern University

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 Nova University

Center for Science and Engineering

1982-83 Bulletin



Nova University

Center for Science and Engineering

1982-83 Bulletin
Computer Science
Computer Systems
Computer Systems/
Technical Communications
Electrical Engineering
Mathematics/
Computer Programming
Physical Science

Nova University is chartered by the State of Florida and accredited by the Southern Association of Colleges and Schools.

Nova University admits students of any race, color, and national or ethnic origin.



The growth of Nova University as a dynamic, mission-oriented educational institution has been coupled with an intensive search for strategies designed to make each of its courses of study maximally responsive to individual human needs. Hence, Nova University continues to press forward in seeking solutions to major societal problems while offering to its students many opportunities for intellectual challenge, professional preparedness and personal awareness.

Alexander Schure
Chancellor

Having entered its second decade, Nova University is beginning to see the impact that its graduates are having the institutions within our society. Many of the University's programs are mission-oriented, designed to improve the performance of professionals, and evidence is being collected which indicates that Nova alumni are having a strong, positive effect on the institutions in which they are employed.

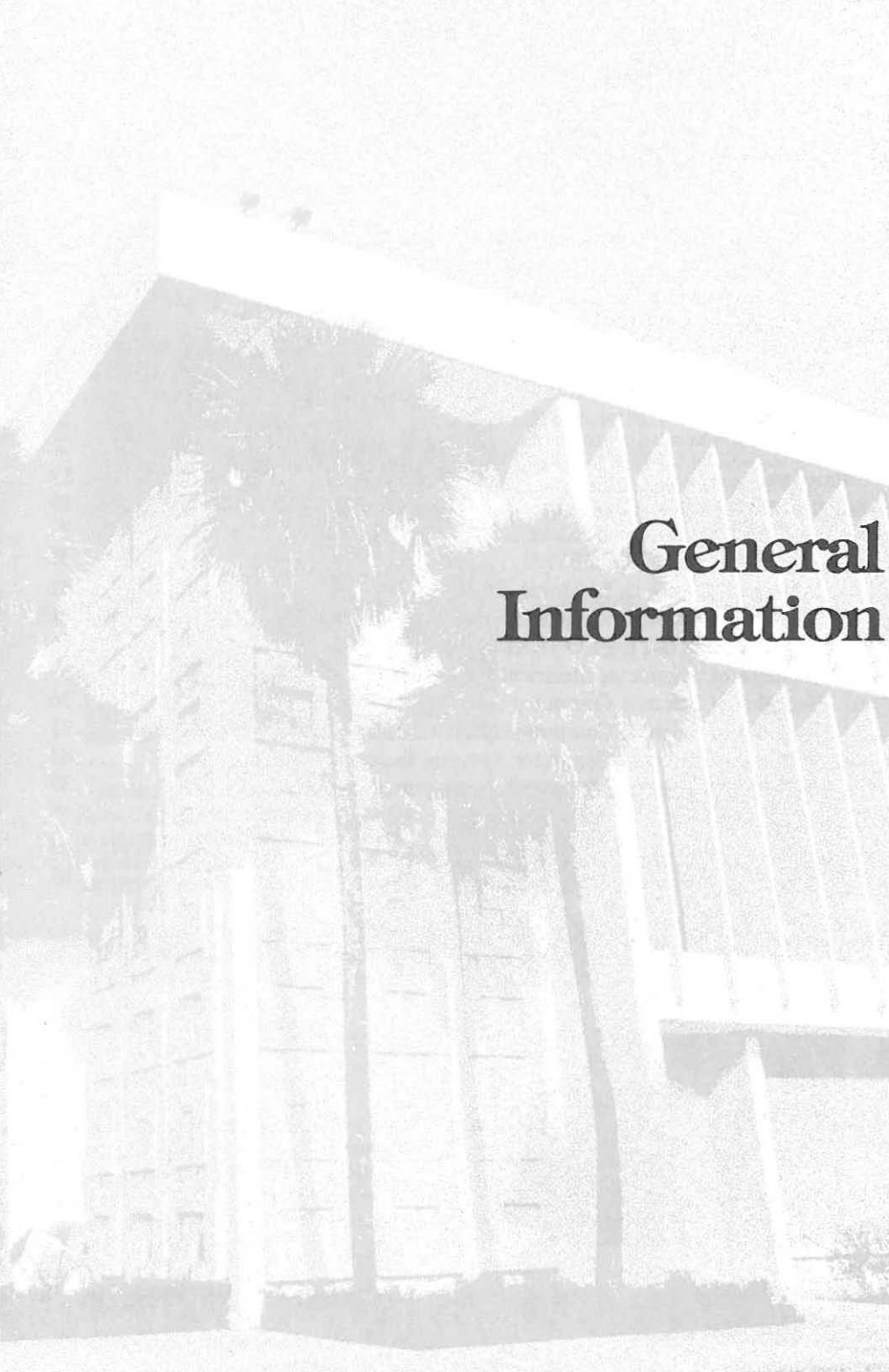
Independent education must continue to be responsive and adaptable to the varying needs of potential students if it is to represent a true alternative to the tax-supported sector. Nova University is committed to maintaining quality at the same time it is meeting these needs.

Abraham S. Fischler
President



Contents

General Information	1
Calendar	2
Admissions	11
Registration	15
Programs of Study	31
GRADUATE PROGRAMS	31
Master of Science in Electrical Engineering	31
Master of Science: Computer Science	31
UNDERGRADUATE PROGRAMS	33
Bachelor of Science in Electrical Engineering	33
Bachelor of Science: Computer Science	36
Bachelor of Science: Computer Systems	41
Bachelor of Science: Computer Systems/Technical Communication	43
Bachelor of Science: Mathematics/Computer Science	39
Course Descriptions	45
Nova University	53
Personnel	65



General Information

Founded in 1964, Nova University is an independent university which is non-sectarian, non-profit and racially non-discriminatory.

Unusual among institutions of higher education, Nova is a university for all ages. Nova College provides undergraduate education. Numerous graduate programs in a variety of fields provide master's, doctoral, and post-doctoral education. Also, non-degree, continuing education programs are offered. The University School, a demonstration school, serves children from pre-school through seniors in high school.

In 1970, Nova University joined in an educational consortium with the New York Institute of Technology, an independent, non-profit institution with campuses in Manhattan and Old Westbury, Suffolk County, Long Island. This mutually beneficial relationship permits each institution to draw on the personal and physical resources of the other, giving maximal benefit to the students of each and to society in general.

With students studying in Florida and in 20 states, Nova University is a university of national scope.

Accreditation Nova University is accredited by the Southern Association of Colleges and Schools.

Campus and Off-campus Locations The Nova University main campus is located on a 200-acre site west of Fort Lauderdale at 3301 College Avenue in the town of Davie, Florida. It is 10 miles inland from the Atlantic Ocean and is easily accessible from major U.S. and state highways, including I-95 and Florida's turnpike.

The Center for the Study of Law is located at 3100 S.W. 9th Avenue in Fort Lauderdale.

Nova University at Coral Springs is located at 3501 University Drive. Degree programs, non-credit courses, and cultural events that serve the residents in north Broward County and in Palm Beach County are held in Coral Springs.

The Oceanographic Center is located on the south side of the marine entrance to Port Everglades at 8000 North Ocean Drive, Dania, Florida.

Many Nova University students attend classes on the main campus, at the Law Center or at Coral Springs. But consistent with its educational mission to provide educational opportunities to adult students wherever they may be, Nova offers degree programs and continuing education experiences at off-campus centers locally, throughout Florida, across the United States, and in foreign countries.

With the New York Institute of Technology, Nova University maintains an office in Washington, D.C. It is located at 1511 K St., N.W. Suite 624.

Academic Calendar—Graduate Programs

SEPTEMBER 1981-AUGUST 1982

Fall Term #8109	August 31-September 14	Registration
	September 14-September 21	Late Registration
	September 21	Classes Begin
	October 16	Last Day to Drop a Course
	December 11	Last Day of Term
Winter Term #8201	December 7-December 18	Registration
	December 21-January 4	Late Registration
	January 4	Classes Begin
	January 29	Last Day to Drop a Course
	March 26	Last Day of Term
Spring Term #8203	March 8-March 22	Registration
	March 22-March 29	Late Registration
	March 29	Classes Begin
	April 23	Last Day to Drop a Course
	June 18	Last Day of Term
Summer Term #8206		
	June 28-July 5	Registration
	July 5-July 12	Late Registration
	July 12	Classes Begin
	August 6	Last Day to Drop a Course
	September 30	Last Day of Term

SEPTEMBER 1982-AUGUST 1983

Fall Term #8209	September 13-September 27	Registration
	September 27-October 4	Late Registration
	October 4	Classes Begin
	October 29	Last Day to Drop a Course
	January 6	Last Day of Term
Winter Term #8301	December 20-January 3	Registration
	January 3-January 10	Late Registration
	January 10	Classes Begin
	February 4	Last Day to Drop a Course
	March 31	Last Day of Term

Spring Term #8304 March 14-March 28
 March 28-April 4
 April 4
 April 29
 June 23

Registration
 Late Registration
 Classes Begin
 Last Day to Drop a Course
 Last Day of Term

Summer Term
 #8307

June 13-July 5
 July 5-July 11
 July 11
 August 5
 September 29

Registration
 Late Registration
 Classes Begin
 Last Day to Drop a Course
 Last Day of Term

Fall Term #8310 September 12-September 26
 September 26-October 3
 October 3
 October 28
 January 5

Registration
 Late Registration
 Classes Begin
 Last Day to Drop a Course
 Last Day of Term



opportunities are now available which did not exist even ten years ago. Now is the time for many individuals to consider entering new fields or to expand their knowledge in their present field. The programs offered by Center for Science and Engineering will prepare both the young person and the adult returning to school to enter these career areas.

Accreditation Nova University is accredited by the Southern Association of Colleges and Schools. Nova is also a member of the College Entrance Examination Board.

Location The Center for Science and Engineering is located in the Orange Plaza Center, 6195 Orange Drive, Suite 6167I, Davie, Florida. All mail should be addressed to: Nova University, Center for Science and Engineering, 3301 College Avenue, Fort Lauderdale, FL 33314.

Phone Nova University main switchboard 475-7300
Center for Science and Engineering

Broward	475-7650, 7651
Dade (toll free)	944-1219 ex. 7650, 7651
Palm Beach (toll free)	732-6600 ex. 7650, 7651

Format Most courses in both the graduate and undergraduate programs offered by the Center have one class meeting per week either at night or on Saturday morning. There are a limited number of day classes offered.

Graduate three semester credit courses meet for 4 hours for twelve weeks. Four terms are offered each year.

Undergraduate three semester credit courses meet for 4.5 hours for nine weeks. Five terms are offered each year. An additional summer session is offered.

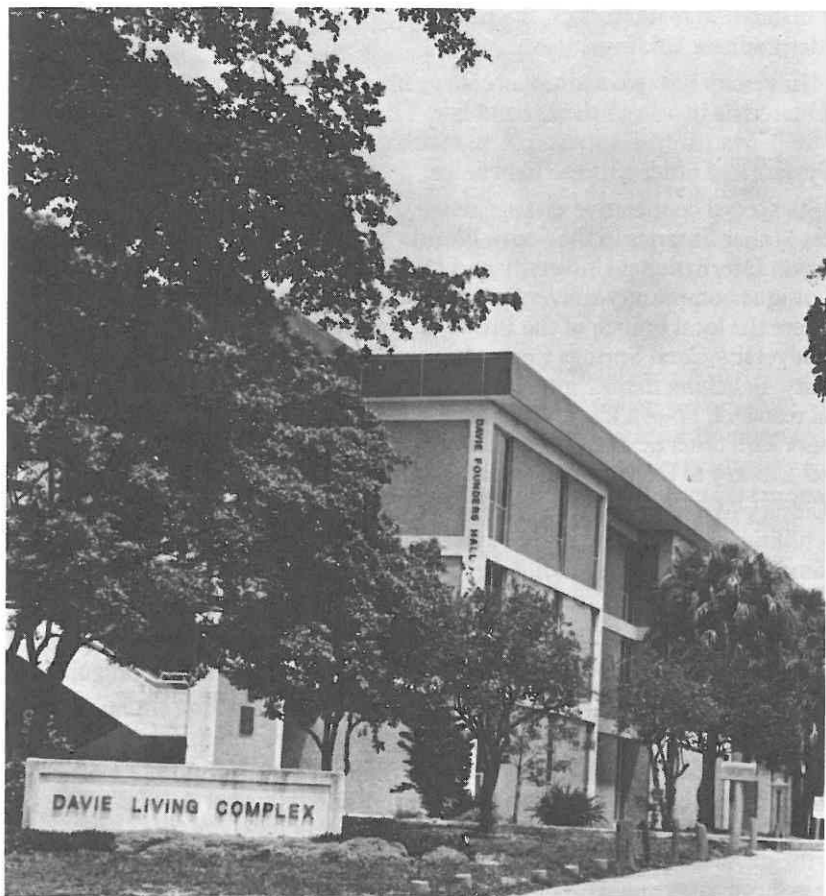
Some courses may have a slight variation from this format but all courses will meet for a minimum of the number of hours as listed above.

Faculty Faculty for the programs offered by the Center for Science and Engineering are drawn from many sources. Full time faculty and administrators carry out traditional roles of teaching, curriculum development, research and publication. Adjunct faculty who are employed full time in industry bring state-of-the art knowledge into the classroom. Outstanding faculty from other institutions are involved in the Center under the Sabbatical Program. Nationally-known professionals are instructors in both the workshop programs and in some of the graduate courses.

In addition, the Center is able to draw on the expertise of the faculty of New York Institute of Technology who have been involved in the program since its beginning.

A board of advisors composed of professionals from local industry assists the center in curriculum development and identification of industry needs.

Housing Located on the main campus are the University apartments consisting of three 3-story buildings of 30 apartments each. A limited number of apartments are available each year. Apartments are leased on a yearly basis. There are no dormitory facilities. For further descriptive information, application forms and off-campus housing information contact the Director of Housing, Nova University.



LEARNING RESOURCES

Libraries Nova University provides appropriate learning resources at each of its academic Centers. In addition, many resources within the broader community are utilized to enrich the learning environment of the students.

The Albert and Birdie Einstein Library in the Mailman-Hollywood Building contains a collection of books and periodicals in the disciplines of the behavioral sciences, education, public administration, electrical engineering, computer sciences, business administration, public communications, and the humanities. This facility also includes individual study carrels and a media room in addition to microform readers.

The George English Library in the Parker Building includes specialized material in mathematics, life sciences, physical science and general undergraduate holdings.

Nova University has two additional college libraries containing specialized materials in ocean sciences and law. Through computer terminals, the Nova Libraries are connected with the DIALOG Information Retrieval System and other national data bases.

Through special cooperative arrangements, Nova University students have access to other libraries in the South Florida Educational Complex, such as Florida International University and Miami Dade Community College. A unique community-university arrangement exists at Coral Springs, where the local branch of the Broward County Public Library and the Nova University Coral Springs Center have a joint "Communiversity" library facility. Believing in maximum interchange of community educational resources, Nova University also maintains cooperative arrangements with other academic libraries in the area, including the Professional Library of the Broward County Public Schools.

The Library Media Services provides a complete non-print media service, including educational materials and equipment in the following formats; 16mm film, videotape, audiotape, recordings, tape/slide presentations, sound filmstrips, and transparencies.

The Library Media Services also provides the complete range of media production services, enabling students and faculty to prepare video recordings, films, slides, audio cassettes, and transparencies for use in class.

Computing Facilities The University Computing Facility provides data processing facilities and services for meeting the instructional, research and administrative needs of the University. The central site is located on the main campus in the Mailman-Hollywood Building. Access to the facility is through terminals and other computer systems located both on

the main campus and at the Port Everglades site. Time-sharing services are available through the local telephone system. This facility is available to qualified students and faculty for research and for computer-oriented course work.

A microcomputer laboratory has been developed in the Parker building to provide the student with hands-on experience and immediate feedback regarding software development and computer language learning. The laboratory is available only to students currently enrolled in courses offered by the Center. A schedule of laboratory hours is posted each term.

Laboratory Facilities Laboratory experiences are available in the areas of electricity, electronics, logic design, firmware design, and computer science. Additional laboratory experiences in electrical engineering are currently being developed. The main laboratory facilities for the Center for Science and Engineering are located on the second and third floors of the Parker Building.

Books Books should be picked up *before* the first night of class because there is usually an assignment to be completed for the first class meeting. Books may be purchased at Corner Book Exchange, 4134 Davie Road Extension, Davie, Florida 33314, Phone: 792-7778.

ADMISSION

Admission-Graduate Programs Graduate work in Computer Science and in Electrical Engineering is based on a strong undergraduate foundation. For this reason a student seeking admission to the graduate computer science program should have an undergraduate major in computer science, engineering, mathematics or physics. A student seeking admission to the graduate electrical engineering program should have an undergraduate major in electrical engineering. Students who do not have one of these majors must take the prerequisite courses on the undergraduate level before being admitted to the graduate program. Students who do have one of these majors may still be required to take specific prerequisite courses.

In addition the applicant must possess the following:

1. a baccalaureate degree granted by an accredited institution representing completion of a course of study which fulfills prerequisites for graduate work in the specific area chosen
2. a 2.5 undergraduate grade point average on a grading scale of 4.0 (A)
3. the intellectual capacity and motivation to pursue graduate work as

determined by credentials and an interview. The interview may be waived if the applicant does not reside in the state of Florida. In this case the application must be supported by three letters of recommendation from individuals who would be in a position to judge the fitness of the candidate to pursue graduate study in the major chosen.

Admission-Undergraduate Programs In order to be admitted as a degree seeking candidate in the undergraduate programs, a student must

1. Submit a high school diploma, GED or college transcripts
2. Demonstrate adequate skills on the Nova College Placement Examination
3. Complete six (6) semester hours at Nova University with at least a 2.0 Q.P.A.
4. declare a major and have a program outline prepared. An evaluation of transfer credit will be made when the program outline is prepared.

An undergraduate student may take six (6) credits as a special student while the admission process is being completed.

Admission-Special Students Individuals will be permitted to take courses as a special student after submitting an application form and application fee. Up to six credits may be taken as a special student. Students desiring to take more than six credits as a special student are required to apply to the Center for permission. Students must have the prerequisite courses and skills for the courses chosen.

Admission-Second Bachelor Degree A student with a bachelor's degree from an accredited institution may earn a second bachelor's degree by completing a minimum of 30 additional credits at Nova University. All major and program requirements must be met. The student should note that this almost always results in more than 30 credits being required of the second degree student. The specific requirements will be identified in the program outline.

Admission—International Students International students must:

1. Demonstrate proof of graduation from an accredited secondary school in their home country.
2. Demonstrate proof that they are able to meet all costs of their education without financial aid from Nova University.
3. Submit a deposit on tuition of \$100 prior to issuance of the student

visa. This deposit is non-refundable if the student fails to enroll at the University. Otherwise, the amount will be credited toward initial tuition.

4. Demonstrate proficiency in the English language through testing in the Nova University Intensive English Program. Failure to achieve satisfactory scores on the test of English will require additional study in the Intensive English Program prior to registering for classes.

International students who need intensive English study prior to enrollment in regular courses should apply for admission to the Intensive English Program at Nova University.

All students for whom English is not their native or primary language will have to demonstrate proficiency in English through the Nova University Intensive English Program.

Admission Process Application forms for admission should be requested from the Center office or the Registrar's office which is located in the Parker Building, 3301 College Avenue, Fort Lauderdale, FL 33314. Application forms must be completed and returned to the Registrar's office with the non-refundable application fee. Checks should be made out to Nova University.

Placement Examination—Undergraduate Majors

The placement examination seeks to determine that the student has the basic skills in communications and in mathematics required to do the work in the program he/she has selected. The tests will primarily assess vocabulary, reading comprehension, writing ability, elementary algebra and intermediate algebra. Students will be placed in courses on the basis of performance in this examination. Second degree students are not required to take this examination.

The examination is given in the evenings and on Saturdays several times a month. A schedule may be obtained from the Center office. Students who do not do well on some part of the examination may have to successfully complete remedial courses before they are admitted to a specific program.

Advanced Standing The University recognizes that students may have acquired a substantial level of academic knowledge in a variety of ways. These may include courses completed at other colleges, technical courses, government and industry training courses, on the job experience and personal reading.

A graduate student may gain advance standing by transfer of credit or credit by examination. A minimum of thirty credits must be taken at Nova University.

An undergraduate student may gain advance standing by any of the processes described below. A maximum of ninety credits may be received through advanced standing. All program requirements must be fulfilled and a minimum of thirty credits in the major area(s) must be taken at Nova University.

Transfer of Credits Courses taken at other regionally accredited institutions may be transferred into the program if they fulfill program requirements.

There is a time limit for transfer of courses. Courses in the area of science, engineering, computer science, and mathematics taken more than ten years before the date of admission to the program will not be eligible for transfer.

Nova University undergraduate students must have prior written permission of the program director to take courses at another institution which they desire to transfer to meet Nova requirements.

Students who want to receive transfer credit for composition (LAN-111) must demonstrate their competence in this area by successfully completing the Nova undergraduate composition competency test.

Graduate students are restricted in the courses which will be accepted for transfer. These are identified in the section outlining program requirements.

Credit by Examination Students who believe they already have a good understanding of the course material may elect to take an examination which may have a written, oral, or lab component in order to demonstrate this knowledge. If they are successful in the examination, they may obtain credit from Nova University for the course. Students are only eligible to take such examinations if they have been admitted to the program and have already completed some course work at Nova University. The charge for the test and for credit by examination is published elsewhere. An examination schedule, a list of courses available for credit and study sheets for some courses may be obtained from the Center office.

NATIONALLY RECOGNIZED COLLEGE LEVEL EXAMINATIONS FOR UNDERGRADUATE STUDENTS ONLY

The College Level Examination Program (CLEP) and Advanced Placement Examinations (AP) are examinations through which a student may achieve advanced standing in college. CLEP is administered at Nova University through the College Board.

Before applying to take any of the CLEP tests, a student should consult an academic counselor to be sure that the credits granted through the exams

are applicable to specific Nova College degree requirements.

To receive credit through CLEP exams at Nova College, a student must score in at least the 50th percentile. For information call 475-7340.

Registration Registration is accepted at any time prior to the beginning of the term. Any student who completes registration after the close of the official registration period will be assessed a late fee. Students are reminded to register early to avoid classes being closed. The registration form and check for total amount due should be mailed to the Registrar's Office, Nova University, 3301 College Avenue, Fort Lauderdale, FL 33314 or delivered in person to the registrar's office, Room 103, Parker Building. The office is open from 8:30 to 6:30 p.m., Monday through Thursday, 8:30 to 5 p.m. on Friday. Checks should be made out to Nova University.

Students may obtain counseling by phone or in person through the Center of Science and Engineering Office.

The University requires that all tuition and fees be paid prior to the beginning of the academic term. Checks should be made out to Nova University.

Students may choose to pay tuition and fees by cash or check, Master Charge, Visa, or Hollywood Buy-O-Matic.

To pay by charge card when mailing a registration, clearly print the card type (Master Charge or Visa), the account number and expiration date in the upper right hand corner of the registration form. For Master Charge, also include the four digit bank number.



TUITION, FEES, FINANCIAL AID

Fee Schedule for 1982-1983

graduate application fee (non-refundable)	\$ 15
graduate registration fee (non-refundable)	\$ 15
graduate late registration fee	\$ 15
graduate tuition fee (per credit) (until 6/30/1982)	\$100
graduate tuition fee (per credit) (after 6/30/1982)	\$130
graduate credit by examination (per credit)	\$130
undergraduate application fee (non-refundable)	\$ 20
undergraduate registration fee (non-refundable)	\$ 10
undergraduate late registration fee	\$ 10
undergraduate tuition fee (per credit) (until 6/30/1982)	\$ 85
undergraduate tuition fee (per credit after 6/30/1982)	\$110
credit by examination (undergraduate) (per 3 credits)	\$110
Graduation fee	\$ 15
Transcript fee (first copy, no fee)	\$ 2
CLEP (payable to College Level Examination Program)	variable
Laboratory and materials fees	variable where applicable
Placement Examination	no fee

Please note that all fees are subject to change. Fees currently in effect are published in the Course Schedule for each term.

Refund Policies

Fees other than tuition are not refundable. Students who wish to receive a refund of tuition upon withdrawal from a course must complete an official withdrawal form. Withdrawal in itself is not a reason for an automatic refund. In the event of a refund, the following schedule applies:

For a 75% refund: withdrawal in writing before the second class meeting, regardless of class attendance.

For a 50% refund: withdrawal in writing before the third class meeting, regardless of class attendance.

No refunds after the third class meeting, regardless of class attendance.

Refunds will be based on the postmark date of written notification, not on the last date of attendance.

Students are not permitted to withdraw from a course after a certain date each term. For undergraduates students this date is before the third to the last class meeting. This date is printed in the schedule of courses for each term.

Financial Aid

The financial aid program at Nova University is

designed to assist students who would find it difficult or impossible to attend college without financial assistance.

Nova University participates in various governmental and private financial aid programs for the benefit of its students. The determining of need is based on a careful assessment of each student's financial situation which takes into account the family's income, assets, debts, number of children, and the estimated cost of attending the University. Application for *all* financial aid must be made annually. Financial aid is a time consuming task, both for students and the University. In order to be considered for funds, applications and all documentation must be in the financial aid office by the designated deadlines.

Nova's policy has always been and will continue to be a personalized approach to serving aid applicants.

The following programs are available to Undergraduate and Graduate Students.

GUARANTEED STUDENT LOAN PROGRAM

A Guaranteed Student Loan (GSL) is a low interest loan made through local financial institutions and is insured by the state or federal government. Unlike other Title IV programs, your eligibility for GSL is not based on need. In general, the interest rate is 7% for students who currently have outstanding GSLs with interest rates of 7% or less. The interest rate for new borrowers is 9% and all subsequent loans to those borrowers will be at 9%. Eligible independent students may borrow up to \$3,000 a year to a total of \$12,500 for undergraduate study. Aid in the form of loans which must be repaid after a student graduates or leaves school is a responsibility that should be considered carefully in making financial plans. Applications are accepted on a continuous basis.

NATIONAL DIRECT STUDENT LOAN PROGRAM (NDSL)

This program is much like the Guaranteed Student Loan Program, except that the determination and distribution of the loan award is made by the Financial Aid Office of the school. Application for a Nova NDSL award is made through the CSS on a Financial Aid Form (FAF). Awards are based on a determination of relative need.

COLLEGE WORK-STUDY PROGRAM (CW-S)

This program makes available on- or off-campus jobs for students with financial need who are able to work on a part-time basis to earn a portion of their educational expenses. Determination and distribution of the CW-S award is made by the Financial Aid Office of the school. Application for a Nova CW-S award is made through the College Scholarship Service (CSS) on an FAF. Awards are based on a determination of relative need.

V. A. BENEFITS

Nova University academic programs are approved by the Coordinator for Veterans Approval, State of Florida, Department of Education, for veterans educational benefits. The Financial Aid Office will assist veterans in applying for benefits.

The following programs are available to Undergraduate Students only.

BASIC EDUCATIONAL OPPORTUNITY GRANT (BEOG or PELL)

The Basic Grant is a federal student financial aid program designed to assist students in the continuation of their education after high school. Awards are made to students based on a uniform determination of need. The application is submitted to the Basic Grant Program. A notice of eligibility estimated award is then returned directly to the student. Upon receipt of this Student Eligibility Report (SER), it should be submitted immediately to the financial aid office, before registration, so that the necessary preparation and counseling may be completed. To be eligible to receive Basic Grant a student must be registered for a minimum of 6 semester hours. If a student should drop below half time status, all monies disbursed during that registration period will be returned to the Basic Grant Program. Awards for the 1981-82 year will range between \$200 and \$1750. Application deadline is March 15, 1982.

FLORIDA STATE STUDENT ASSISTANCE GRANT

The Florida Student Assistance Grant is funded by the State of Florida. This grant is available to eligible students who have 24 months of consecutive residency in the state of Florida preceding the beginning of the academic year and have demonstrated need. To be eligible for Florida Grant a student must be registered as a full time student (12 semester hours). If a student should drop below full time status, all monies disbursed during that registration period will be returned to the State. Awards range up to \$1200 a year. Application deadline for 1982-83 is April 1, 1982.

FLORIDA TUITION VOUCHER FUND

Florida Tuition Voucher Fund (FTVF) is a grant program funded by the state of Florida that provides tuition assistance to resident students. To be eligible to receive FTVF the student must complete the necessary application and provide a copy of his/her Florida high school diploma, proof of two-year residency, and a transcript evaluation from Nova University to determine class status. Students with less than 90 credits as of July 31, 1981, may be eligible. Students must also be registered as full time students (12 semester credits). If a student should drop below full time status, all monies disbursed during the registration period will be returned to the state.

Awards for the 1981-82 year will be \$375 per trimester to a maximum of \$1125 per year.

CAMPUS-BASED AID PROGRAMS, 1982-83

In order to be considered for the following aid programs, students need to have a Nova University Financial Aid Application and Financial Aid Form (FAF) on file by the designated deadline dates. For returning students, the FAF must be mailed to College Scholarship Service (CSS) no later than March 15th. Nova University Student Aid Application must be returned to the financial aid office on or before April 15. For new financial aid students, the FAF must be mailed by May 1 to College Scholarship Service (CSS). The Nova University Student Aid Application must be returned to the Financial Aid Office on or before June 1.

The Supplemental Educational Opportunity Grant (SEOG) Programs are for students who demonstrate need and would be unable to continue their education without additional assistance. Need is determined by use of the Financial Aid Form (FAF) which all financial aid students must complete. SEOG funds are very limited; only those students who have met the necessary deadline dates and have completed files can be considered. Awards will range between \$200 and \$800 for the 1981-82 year. Application deadline for 1982-83 is April 1, 1982, for returning students and June 1, 1982, for new students.

Application for all Financial Aid must be made annually. For further information about these programs, contact the Nova Financial Aid Office.



Transcripts Nova University transcripts are available only to students who have no outstanding financial obligations to the University. Transcript request forms are available at each program office.

Attendance Nova programming for adult learning makes class attendance essential. If an emergency necessitates an absence, a makeup assignment should be planned in consultation with the instructor.

ACADEMIC STANDARDS

Grades

		Quality Points
A	Excellent	4
B	Good	3
C	Satisfactory	2
D	Marginal	1
F	Failure	0
W	Withdrawn Without Penalty	---
I	Incomplete	---
I/W	Incomplete/Withdrawn	---
P	Pass	---
PR	Progress	---
NG	No Grade	---

Certain courses are designated Pass, Progress, and Fail only.

Incomplete The "I" grade may be obtained only with the approval of the instructor on the Incomplete contract. The student will have up to one additional term to complete the work for the course and receive the letter grade.

For undergraduate students, if the course is not completed within the extension period the "I" grade changes to the earned letter grade which is based on total course requirements.

For graduate students, if the course is not completed within the extension period the "I" grade changes to an "F" which remains permanently on the transcript.

Quality Point Averages A student's academic standing for a specific term is the Quality Point Average (QPA). The QPA is computed by multiplying the number of semester hours times the number of quality points earned for each course taken that term and dividing the total number of quality points by the total number of credits earned that term.

The student's overall academic standing is the Cumulative Quality Point Average (CQPA). The CQPA is computed by multiplying the number of semester hours times the number of quality points earned for each course taken at the College and dividing the total number of quality points by the total number of credits earned at the College.

Graduate students are required to maintain a minimum CQPA of 3.0.

Undergraduate students are required to maintain a minimum CQPA of 2.0 with a CQPA of 2.25 required for graduation.

Graduate Withdrawal Policy The last day for withdrawal from a course is published each term in the schedule for classes. Students seeking to withdraw from a course must first get the written approval from the instructor.

Undergraduate Withdrawal Policy A student may withdraw from a course during the first three weeks of the course without the instructor's consent by filing the appropriate form. After the first three weeks of the course, the student seeking to withdraw from a course must get the written approval of the instructor and program advisor. Both are expected to discuss the basis of this request and the wisdom of this course of action. Such a withdrawal will appear on the transcript but will not be included in the Quality Point Average. No withdrawal is permitted during the last three weeks of class.

Academic Expectations—Graduate Program

It is expected that graduate students enter the program having a first level of professional training in their area of concentration and that they will perform as professionals in their coursework.

Skill and Competency Requirements—

Undergraduate Programs Students are expected to demonstrate skills appropriate for college work in English (reading, writing, and speech) and in mathematics in all courses at Nova College. During the first term of enrollment, students will complete placement tests and will be advised as to appropriate course selection based on test results. Any who may need to develop further the skills required for Nova College work will be counseled as to opportunities available for assistance. While a student is acquiring these skills, his or her enrollment is limited to courses approved by an advisor, generally at the 100 or 200 level.

All students are also required to pass competency tests in college composition and mathematics (elementary algebra). Students with high scores on placement tests may take competency tests immediately; others will take them after completing appropriate course work to acquire the competencies.

The mathematics competency requirement may be met through the successful completion of MAT-150 or a higher level mathematics course. Students who elect this option do not have to take the mathematics competency examination.

COURSE PREPARATION

To insure that students can obtain maximum benefit from the Nova course format, most courses have assignments to be completed before the first meeting. These assignments are posted and available through divisional offices during registration. The course outline is distributed at the first class meeting.

Students should anticipate spending a substantial amount of time in preparation for each session to complete the course objectives and requirements set forth in the course outline. Courses with 300 and 400 numbers are considered to be upper division college level and require in-depth preparation and performance. Students experiencing difficulty keeping up with course requirements should consider reducing their course load.

REPEATED COURSES

Students may repeat a course to improve their grade but credit toward graduation will be granted only once. Both enrollments will appear on the transcript. The second enrollment will have a notation that it is a repeated course. The highest grade will be counted in the student's Quality Point Average.

SKILL DEVELOPMENT COURSES

Special courses designed to help students attain the skills necessary for successful college work (090-099) do not count toward graduation. Upon completion of one of these courses a student not yet achieving all required skills will receive a PR (Progress) grade and may re-enroll to continue to work toward the required competencies.

Academic Progress-Graduate Programs To remain in good academic standing a graduate student must maintain a CQPA of 3.0 or higher.

A candidate is expected to complete course work and the thesis or practicum in four years. The University reserves the right to withdraw the matriculation status of a student who does not fulfill this time requirement and it also reserves the right to withdraw the privilege of enrollment from a student whose grade average falls below 3.0.

Academic Progress—Undergraduate Programs

SATISFACTORY ACADEMIC PROGRESS

To remain in good academic standing, an undergraduate student must maintain an average of C or higher on all credits attempted (quality point

average of 2.0 on a 4.0 scale). A CQPA of 2.25 is required for graduation in all of the undergraduate majors offered by the Center for Science and Engineering.

ACADEMIC PROBATION

A student failing to earn a 2.0 average or higher after his first 12 credits of work or to maintain at least 2.0 thereafter, will be placed on probation. Academic probation is removed when the student earns a cumulative quality point average of 2.0 or higher at Nova University.

After being placed on probation, any student receiving financial aid must remove the probation during the next period of enrollment to be eligible for further financial aid.

SUSPENSION

To avoid suspension, a student on probation must maintain a quality point average of 2.0 or better for each term of subsequent enrollment, otherwise he or she will be placed on suspension for one term.

Following this suspension, the student may re-enroll. Failure of the student to maintain a 2.0 grade point in each of the two terms subsequent to re-enrolling will result in final suspension.

COUNSELING

Students are encouraged to seek counseling when their quality point average places them in danger of probation so that a cooperative plan may be devised to assist them to improve.

APPEAL

Any student placed on suspension may file a petition for review by the Academic Progress Committee.

A student placed on final suspension may, after a two term absence, request a hearing before the Academic Progress Committee for the purpose of showing cause for readmission.

Requirements for a Degree

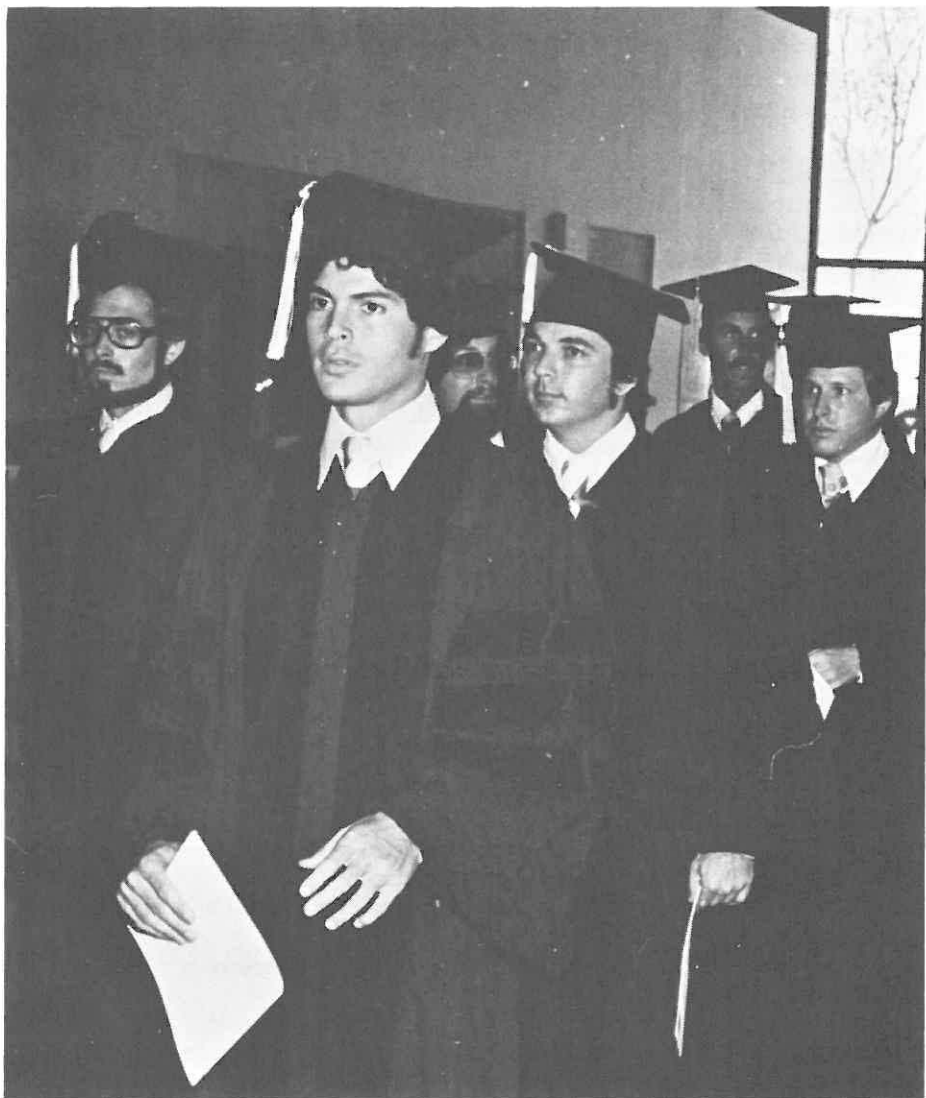
In order to qualify for a degree the student must:

1. have been admitted to the degree program.
2. complete the courses and number of credits as specified by program requirements.
3. pass competency requirements in English and Mathematics (undergraduate only).
4. have a 3.0 quality point average for a graduate program or a 2.25 quality point average for an undergraduate program.
5. complete the minimum number of credits at the University as

specified elsewhere in this catalog.

6. submit a graduation form and payment of graduation fee prior to completing registration for the last term.

7. have fulfilled all financial obligations to Nova University including the library, the laboratories and the comptroller's office.



STUDENT RIGHTS AND RESPONSIBILITIES

Students of the Center for Science & Engineering will enjoy the same rights and services as all other Nova University students, including use of University study and recreational facilities, all support services, and participation in student affairs.

Students will be expected to maintain University standards of conduct, which prohibit theft, plagiarism, and abuse and misuse of facilities or equipment.

Statement of Academic Rights and Responsibilities

Nova University, as a community of women and men, is committed to furthering scholarship, academic pursuits, and service to our society. As an institution, our purpose is to assure every student an equal opportunity to fulfill her or his potential as a student at the highest standard of excellence.

Certain rights and obligations flow from membership in the academic community including:

1. the rights of personal and intellectual freedom which are fundamental to the idea of a university;
2. a scrupulous respect for the equal rights of others; and
3. dedication to the scholarly and educational purposes of the university and participation in promoting and assuring the academic quality and credibility of the institution.

The University expects its students to manifest a commitment to academic integrity, and to that end a definition of original work is presented for each student's information, instruction, and acceptance.

Assignments such as course preparations, exams, tests, projects, term papers, practicums, MARPS, etc., must be the original work of the student. Original work may include the thoughts and words of another, but if this is the case, those ideas or words must be indicated by quotation marks or other accepted reference devices.

Work is not original which has been submitted previously by the author or by anyone else for academic credit. Work is not original which has been copied or partially copied from any other source including another student unless such copying is acknowledged by the person submitting the work for credit at the time the work is being submitted or unless copying, sharing, or joint authorship is an expressed part of the assignment. Exams and tests are

original work when no unauthorized aid is given, received, or used prior to or during the course of the examination.

A student who is found guilty of academic misconduct shall be subject to the maximum sanction of dismissal or any lesser sanction. Academic misconduct includes all forms of student academic misconduct wherever committed, illustrated by, but not limited to cases of plagiarism and dishonest practices in connection with examinations. All work submitted by students must be their own work project; where the language of another is set forth quotation marks must so indicate, and appropriate credit must be given when the language, ideas, expressions, and writings of another are used. In addition to academic standards, the student must maintain behavior appropriate to professional standards.

A student should not interfere with the rights of other students seeking their education at the University. Accordingly, theft, vandalism, and any other disruptive behaviors are unacceptable.

Where circumstances are such as to place a student in a position of power over University personnel, inside or outside the institution, the student should avoid any reasonable suspicion that he/she has used that power for personal benefit or in a capricious manner.

Grievance Procedures

I. STUDENT GRIEVANCES ARE DEFINED TO INCLUDE:

1. A student complaint against a policy, procedure or administrative action or interpretation of a policy, procedure or administrative action. In such a case the student should meet with the program administrator in the first instance in an attempt to reach a satisfactory resolution. (If this does not satisfy the student, the student should follow the formal grievance procedures outlined in the section below entitled: IV. Procedure—Formal Grievance.)
2. A complaint between an instructor and student concerning an academic activity. (In such case the student would follow procedures outlined in the section entitled: III. Procedure—Informal Grievance.)

II. GRIEVANCE TIME LIMITATIONS:

Any grievance procedure, informal or formal, must be initiated within 60 days following the term in which the event or series of events occurred.

III. PROCEDURE—INFORMAL GRIEVANCE:

1. The student should discuss the grievance in the first instance with the instructor in case of a grievance involving an academic activity.

2. If the student and instructor do not reach a satisfactory resolution of the problem, the instructor or student should schedule within two weeks following their discussion a conference with the program administrator or Center Director.
3. If a satisfactory resolution of the problem is not reached between the program administrator and the student, the program administrator should schedule another conference with the student and the instructor within two weeks at which the program administrator shall preside.
4. A memorandum outlining the decision reached at this conference must be sent by the program administrator to the student and the instructor within two weeks. If the issue is not settled to the mutual satisfaction of the student or the instructor, either one may follow the formal grievance procedure.

IV. PROCEDURE—FORMAL GRIEVANCE:

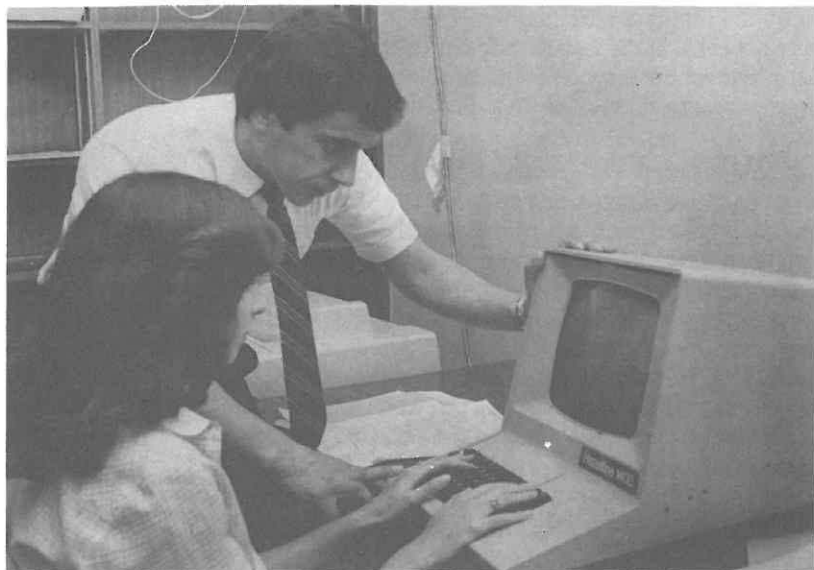
Formal grievances must be written (printed or typed) and copies submitted to the program administrator *and* the Director of the Center for Science & Engineering within 60 days following the date of the event or series of events in question or within two weeks following the completion of the informal grievance procedures as outlined in the section entitled: III. Procedure—Informal Grievance. No grievance will be considered if it is filed beyond the time stipulated. It will always be in the interest of the student to file a grievance as early as possible. This formal grievance statement must include, but *not* be limited to, the name of the program administrator, the name of the program and program division, the date or dates of the event(s) questioned, the name or names of the person(s) involved, a description of the problem and a description of any and all attempts to resolve the question prior to filing a formal grievance. No formal grievance can be filed without first following the informal procedures as stated in I and III.

Within ten days after the formal grievance statement is filed (mailed or personally delivered), the director will notify the student or instructor of a hearing to discuss and resolve the issue. This hearing will include the student, the director or his designee, the program (department, major or division) director most closely associated with the issue and any others (instructors, students, etc.) directly involved in the complaint.

The hearing will be chaired by the director or his designee. At this hearing, a Grievance Judgment Committee (see below) consisting of four members, two students and two University employees, appointed by the Director will hear the case. The Committee will report its findings in writing to the Director. The Director will inform in writing the parties involved of the final decision within one week after the hearing. This judgment will be considered final and any further appeal must be appealed to the President of the University.

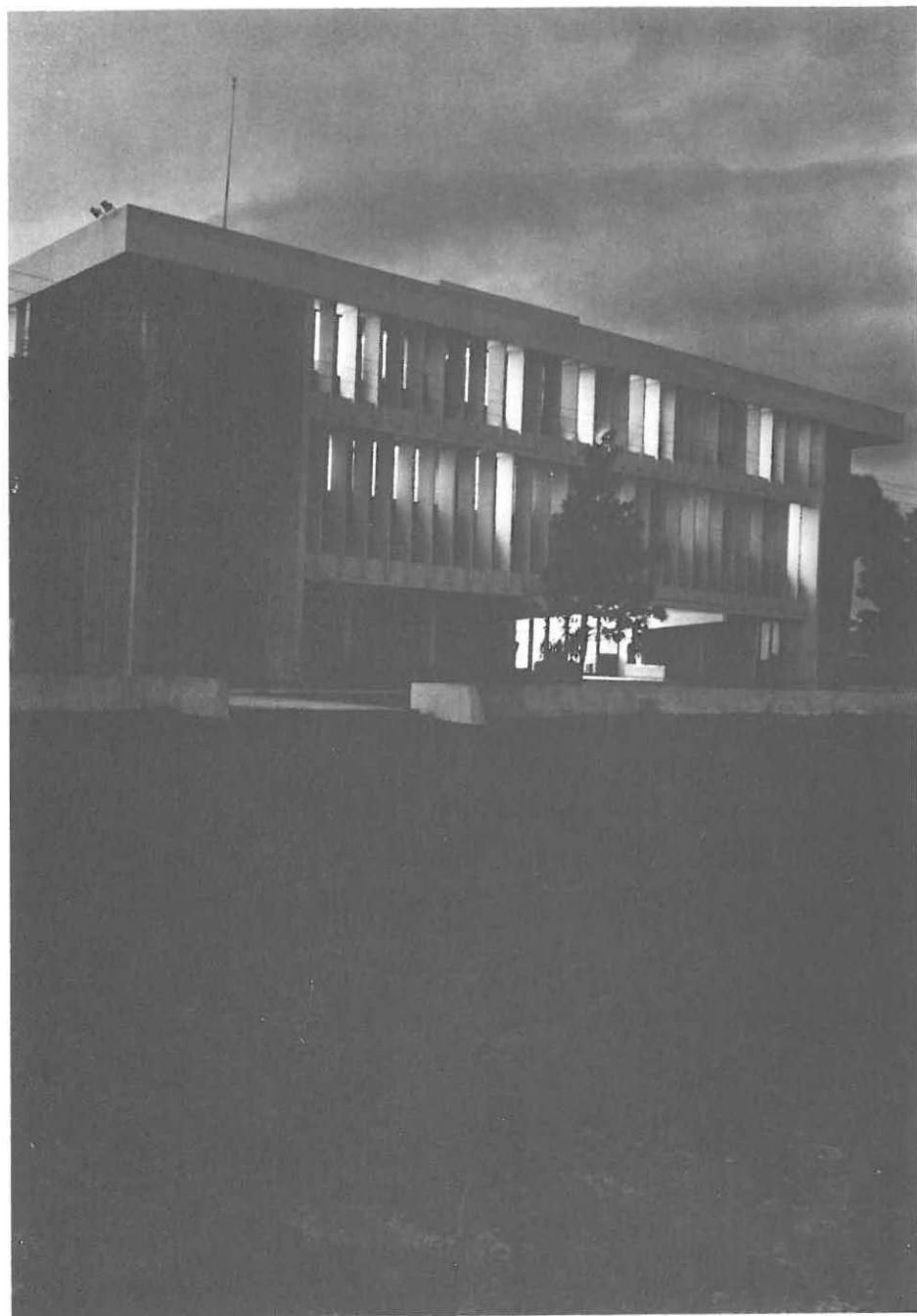
V. GRIEVANCE JUDGMENT COMMITTEE

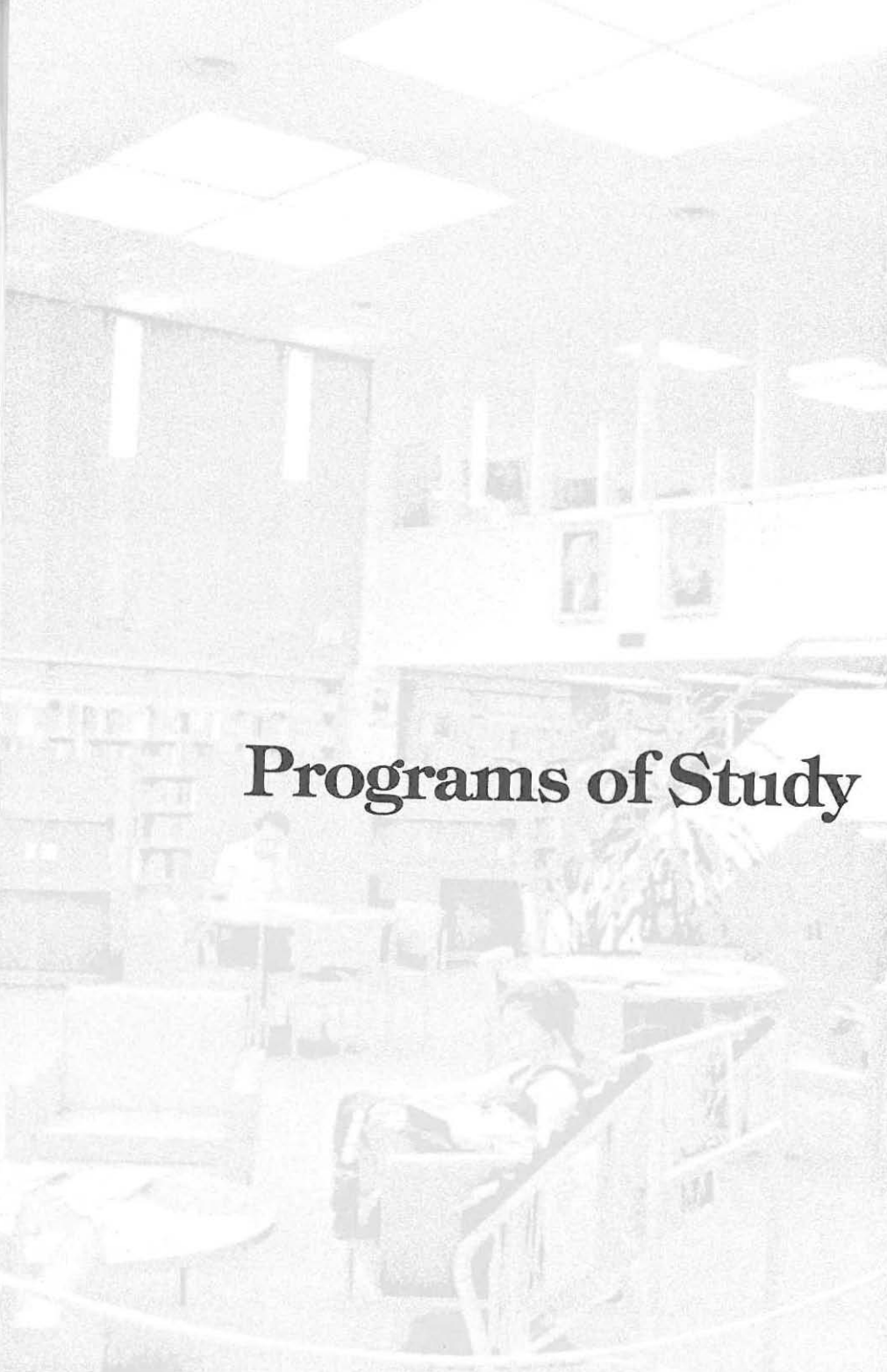
The Director of the Center for Science & Engineering will appoint annually, on or before September 30, a standing Grievance Judgment Committee of four persons, two students of the Center, and two employees of Nova University. The Director will convene and chair this committee whenever a hearing for student grievance is needed or to review and revise existing student grievance procedures. After a hearing the committee will reconvene to come to a judgment on the grievance issue. This judgment will be determined by majority vote. In the case of a tie vote, the Director will be informed and will cast the deciding vote.



Reservation of Power Nova University shall reserve the right to amend, modify, change, add or delete such rules and regulations which may affect its relations with its students, as may be prescribed by law or deemed necessary by the administration.

Further, Nova University reserves the right to change academic requirements, curriculum, tuition and/or fees when in the judgment of the administration such changes shall be required.





Programs of Study

MASTER OF SCIENCE IN ELECTRICAL ENGINEERING

The MSEE degree program is currently being developed by the Center. Individuals who are interested should contact the Center office for further information.

MASTER OF SCIENCE WITH A MAJOR IN COMPUTER SCIENCE—

The Center for Science and Engineering offers a graduate program leading to the degree of Master of Science with a major in Computer Science. The program has been designed to give the student an in-depth knowledge of computer systems and their numerous applications. The program emphasizes those areas of specialization which are currently of great importance for the industry, mainly:

- Operating system design
- Very large scale integration
- Array processors
- Compiler construction
- Data base and data communications design
- Numerical analysis
- Structured programming, microprogramming and software engineering
- Computer system performance
- Computer simulation and modelling

Students will participate in ongoing projects in the area of research of the major professor.

Students applying for admission to the Masters in Science, Major in Computer Science Program who do not have an undergraduate major in computer science must satisfy the following undergraduate prerequisites through prior course work or through taking the indicated undergraduate courses.

- A. Higher level programming languages such as Fortran, Cobol, Pascal, and Assembly language.
- B. CS-150, Introduction to Computer Organization.
- C. CS-340, Data Structures.
- D. Mathematics including calculus, linear algebra, and some discrete mathematics.

MASTER OF SCIENCE/MAJOR IN COMPUTER SCIENCE DEGREE REQUIREMENTS

Two options leading to the Master of Science degree in Computer Science are offered. The requirements for both the thesis and the non-thesis option are:

The completion of 36 semester hours of graduate credit of which 21 semester hours are required courses and must include the following courses:

- ICS-616 Theory and Principles of Programming
- ICS-630 Programming Languages
- ICS-634 Compiler Design Theory
- ICS-635 Compiler Implementation
- ICS-650 Operating Systems Theory and Design
- ICS-660 Data Base Management
- ICS-690 Software Engineering

The additional requirements for the thesis option are the completion of nine semester hours of approved elective courses in Computer Science, and six semester hours for a written thesis.

The non thesis option has the additional requirement of the completion of 15 semester hours of approved elective courses in Computer Science.

ELECTIVES

- ICS-618 Systems Programming and Project Implementation
- ICS-620 Graph Theory
- ICS-622 Complexity Theory
- ICS-624 Operations Research
- ICS-625 Numerical Analysis
- ICS-626 Modelling and Simulation
- ICS-632 Language Theory and Automata
- ICS-640 Digital Computer Design
- ICS-645 Integrated Computer Systems (VLSI)
- ICS-646 Array Processors and Super Computers
- ICS-647 Concurrent Programming Languages
(ADA, Modula, Simula-67)
- ICS-651 Operating Systems Implementation
- ICS-656 Network Design and Analysis
- ICS-658 Data Communications
- ICS-675 Systems Performance Evaluation
- ICS-680 Microprogramming and Microprocessors
- ICS-691 Software Engineering Implementation
- ICS-694 Management in Data Processing
- ICS-695 Management in Data Processing Practicum
- ICS-696 Management of Research and Development
- ICS-692 Advanced Topics Seminar

BACHELOR OF SCIENCE IN ELECTRICAL ENGINEERING

This is a professional engineering degree with a clearly identified curriculum. The electrical engineer will be hired for such career opportunities as research, conceptual design, system synthesis and development, product innovation and operations management. The engineer is described by A.B.E.T. as a conceptualizer, an innovator, planner/predictor, designer, developer, systematizer, judge, decision maker, producer of standard, formulator of techniques and methods, synthesizer.

Although the electrical engineer may perform many different functions when hired by different companies, there still exists a generalized concept of the basic training needed for the electrical engineer. This program contains a high level of mathematical computation which is evident both in the level of the mathematics courses required for the major and the use of the mathematics in the engineering and electronic courses. This program is generally a 4.5 to 5 year program on a full-time basis. At Nova this program will require 138 credits for graduation compared to 120 credits for other bachelor degrees.

GENERAL DISTRIBUTION REQUIREMENTS

Communications (6 cr.) (LAN 111, LAN 112, or TEC 330)

Humanities (6 cr.)

Social and Behavioral Sciences (12 cr.)

MATHEMATICS REQUIREMENTS

MAT 210	Calculus I	3
MAT 220	Calculus II	3
MAT 305	Calculus III	3
MAT 310	Differential Equations	3
*MAT 360	Matrices and Statistics	3
*MAT 420	Linear Algebra	3
MAT 440	Numerical Analysis	3
*MAT 450	Probability and Statistics	3

PHYSICAL SCIENCE REQUIREMENTS

PHY 140	Physics I	3
PHY 150	Physics II	3
PHY 160	Physics III	3
PHY 212	Science of Matter (or general Chemistry course)	3
PHY 310	Modern Physics	3

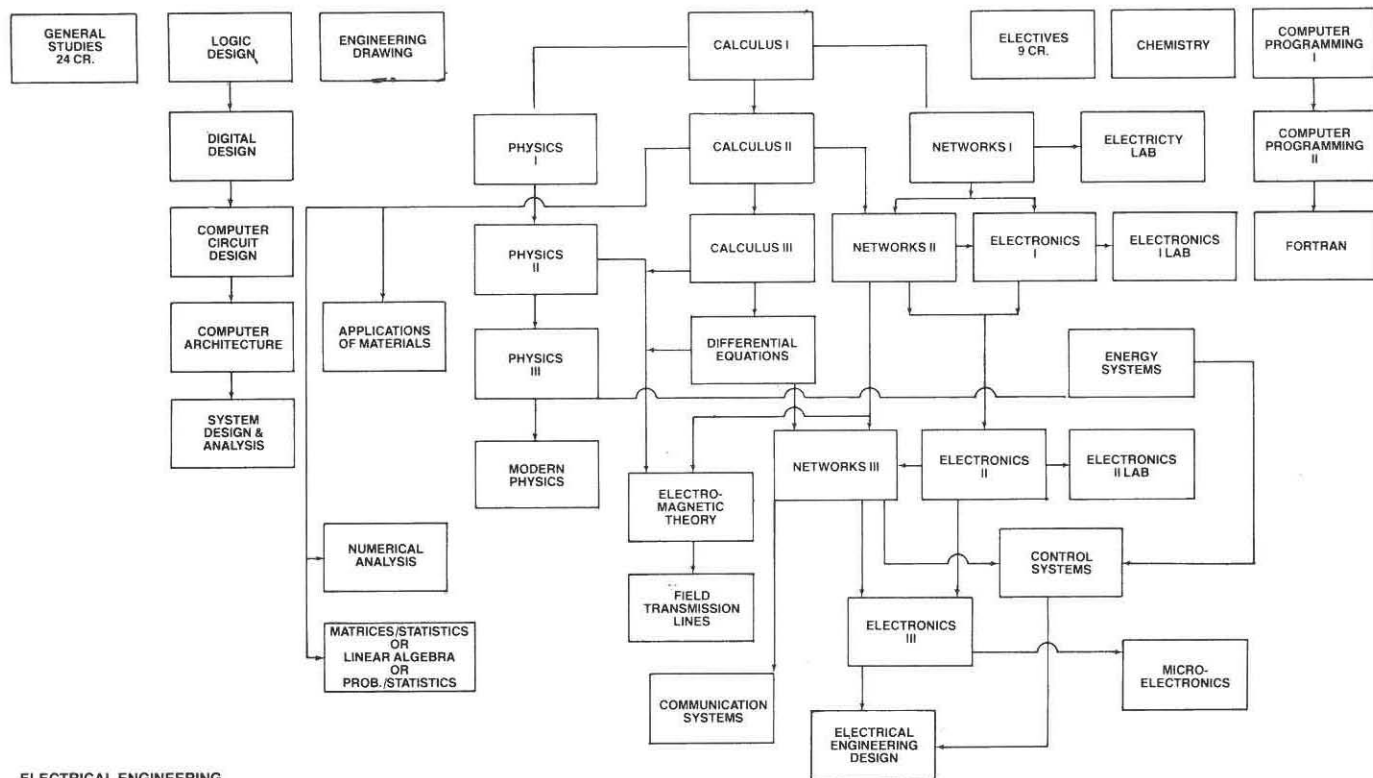
COMPUTER SCIENCE REQUIREMENTS

CS 160	Fundamentals of Logic Design	3
CS 170	Computer Programming I (BASIC)	3
CS 200	Computer Programming II	3
CS 210	Fortran	3

CS 240	Digital Design	3
CS 350	Computer Circuit Design	3
CS 360	Computer Architecture	3
CS 410	System Design and Analysis	3
ELECTRICAL ENGINEERING REQUIREMENTS		
EE 210	Networks I	3
EE 255	Electricity Laboratory	1
EE 310	Networks II	3
EE 330	Electronics I	3
EE 335	Electronics Lab I	1
EE 340	Electronics II	3
EE 345	Electronics Lab II	1
EE 400	Electronics III	3
EE 405	Networks III	3
EE 410	Electromagnetic Theory	3
EE 420	Field Transmission Lines	3
EE 430	Fundamentals of Communication Systems	3
EE 440	Energy Systems	3
EE 450	Control Systems	3
EE 460	Micro-electronics	3
EE 470	Electrical Engineering Design	3
ENGINEERING SCIENCE REQUIREMENTS		
ES 220	Engineering Drawing	3
ES 310	Engineering Applications of Materials	3
ELECTIVES		9

*Choose 1 of *courses





ELECTRICAL ENGINEERING

BACHELOR OF SCIENCE/MAJOR IN COMPUTER SCIENCE

The field of Computer Science is expanding rapidly. The program as presented here has a strong component in hardware design and development coupled with a strong software component. Many people in the computer industry find they need strengths in both areas. This program will provide a substantial base for the graduate to work in a number of computer career fields in computers and to pursue graduate work in computer science.

GENERAL DISTRIBUTION REQUIREMENTS

Communications (6 cr.) LAN 111, LAN 112 or TEC 330

Humanities (6 cr.)

Social and Behavioral Sciences (12 cr.)

MATHEMATICS REQUIREMENTS

MAT 150	Precalculus	3
MAT 210	Calculus I	3
MAT 220	Calculus II	3
*MAT 360	Matrices and Statistics	3
*MAT 420	Linear Algebra	3
MAT 440	Numerical Analysis	3
*MAT 450	Probability and Statistics	3

PHYSICAL SCIENCE REQUIREMENTS

PHY 140	Physics I	3
PHY 150	Physics II	3
PHY 160	Physics III	3
PHY 212	Science of Matter (or general Chemistry course)	3

COMPUTER SCIENCE REQUIREMENTS

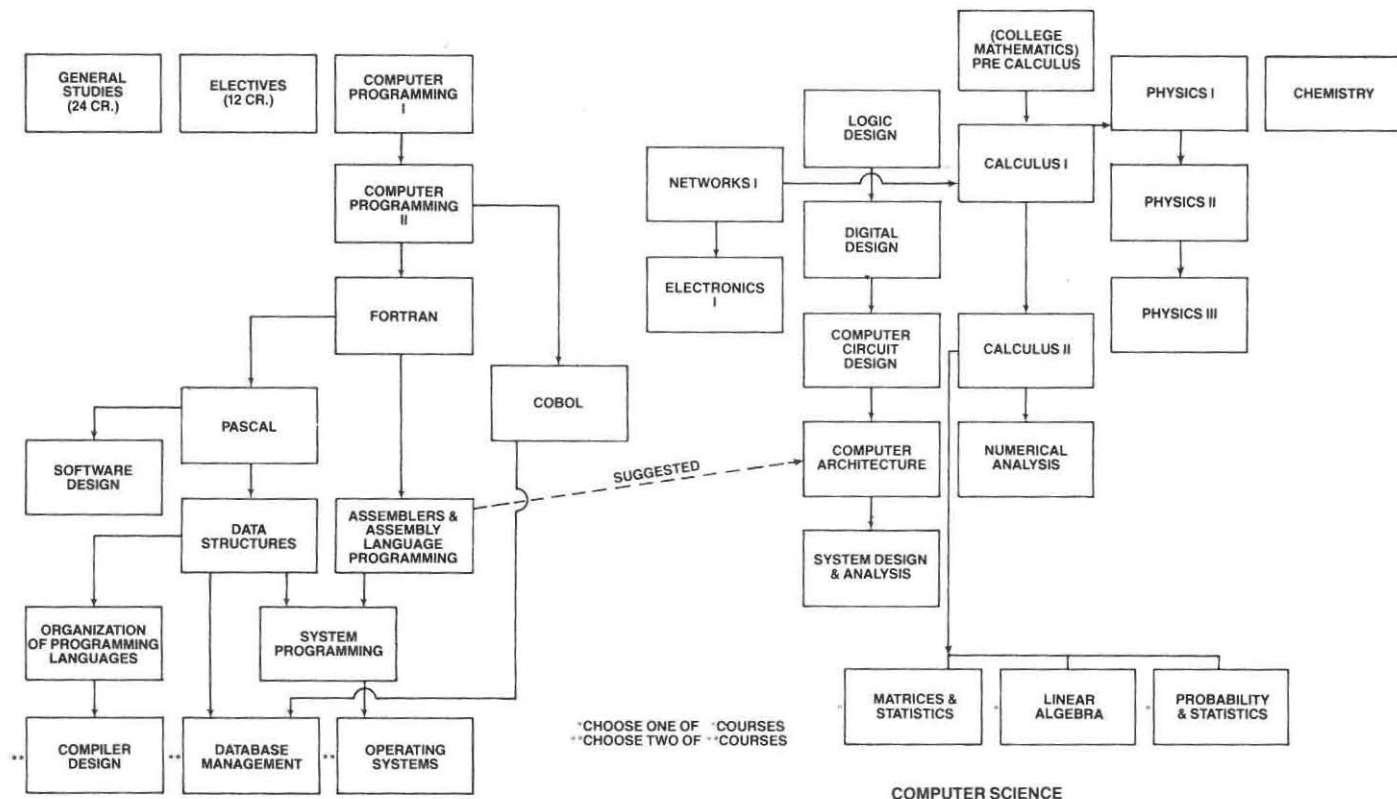
CS 150	Fundamentals of Logic Design	3
CS 170	Computer Programming I	3
CS 200	Computer Programming II	3
CS 210	Fortran	3
CS 220	Cobol	3
CS 240	Digital Design	3
CS 320	Organization of Programming Languages	3
CS 330	Structured Programming (Pascal)	3
CS 335	Assemblers & Assembly Language Programming	3
CS 340	Data Structures	3
CS 350	Computer Circuit Design	3
CS 360	Computer Architecture	3
CS 370	Software Design	3
CS 410	System Design and Analysis	3
**CS 420	Operating System Concepts	3
**CS 450	Data Base Management Systems Design	3

CS 460	System Programming	3
**CS 480	Introduction to Compiler/Interpreter Design	3
ELECTRONICS REQUIREMENTS		
EE 110	Networks I	3
EE 120	Electronics II	3
ELECTIVES		12

*Choose 1 *courses

**Choose 2 of **courses.





BACHELOR OF SCIENCE/MAJOR IN MATHEMATICS-COMPUTER PROGRAMMING

While providing the student with basic information about computer hardware, this program combines a full major in mathematics with a strong programming component. Graduates will be well prepared to assume analytical and programmer roles in computer careers as well as follow career paths or graduate training in mathematics.

GENERAL DISTRIBUTION REQUIREMENTS

Communications (6 cr.) LAN 111, LAN 112, or TEC 330

Humanities (6 cr.)

Social and Behavioral Sciences (12 cr.)

MATHEMATICS REQUIREMENTS

MAT 210	Calculus I	3
MAT 220	Calculus II	3
MAT 305	Calculus III	3
MAT 310	Differential Equations	3
MAT 320	Advanced Calculus	3
MAT 420	Linear Algebra	3
MAT 430	Functions of a Complex Variable	3
MAT 440	Numerical Analysis	3
MAT 450	Probability & Statistics	3

PHYSICAL SCIENCE REQUIREMENTS

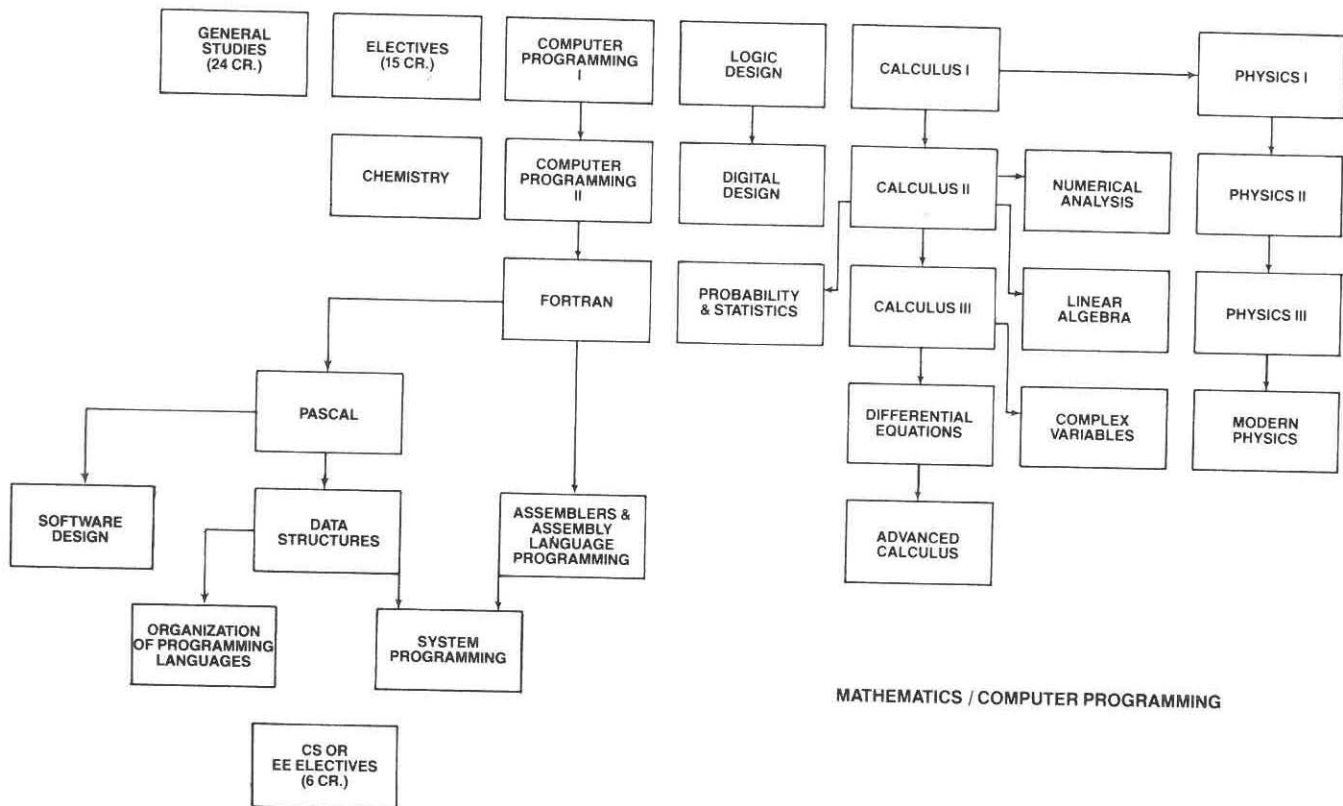
PHY 140	Physics I	3
PHY 150	Physics II	3
PHY 160	Physics III	3
PHY 212	Science of Matter (or general Chemistry course)	3
PHY 310	Modern Physics	3

COMPUTER SCIENCE REQUIREMENTS

CS 160	Fundamentals of Logic Design	3
CS 170	Computer Programming I (BASIC)	3
CS 200	Computer Programming II	3
CS 210	Fortran	3
CS 230	Structured Programming (PASCAL)	3
CS 240	Digital Design	3
CS 320	Organization Programming Languages	3
CS 335	Assemblers and Assembly Language Programming	3
CS 345	Data Structures	3
CS 370	Software Design	3
CS 460	Systems Programming	3

ELECTIVES 15

CS or EE electives 6



BACHELOR OF SCIENCE/MAJOR IN COMPUTER SYSTEMS

Computer Systems has been developed for students who desire to combine computer and business components in their degree program. This program focuses on a computer systems approach and on programming techniques rather than on circuit design or computer hardware development.

GENERAL DISTRIBUTION REQUIREMENTS

Communications (6 cr.) (LAN 111 and LAN 112 or TEC 330)

Humanities (6 cr.)

Social and Behavioral Sciences (12 cr.)

MATHEMATICS REQUIREMENTS

MAT 150 Pre Calculus 3

MAT 210 Calculus I 3

PHYSICAL SCIENCE or LIFE SCIENCE REQUIREMENTS 9

COMPUTER SCIENCE REQUIREMENTS

CS 150 Introduction to Computer Organization 3

CS 170 Computer Programming I 3

CS 200 Computer Programming II 3

CS 210 FORTRAN 3

CS 220 COBOL 3

CS 320 Organization of Programming Languages 3

CS 330 Structured Programming (PASCAL) 3

CS 335 Assemblers & Assembly Language Programming 3

CS 340 Data Structures 3

CS 370 Software Design 3

*CS 420 Operating System Concepts 3

CS 450 Data Base Management Systems Design 3

CS 460 System Programming 3

*CS 470 Information Systems Analysis & Design 3

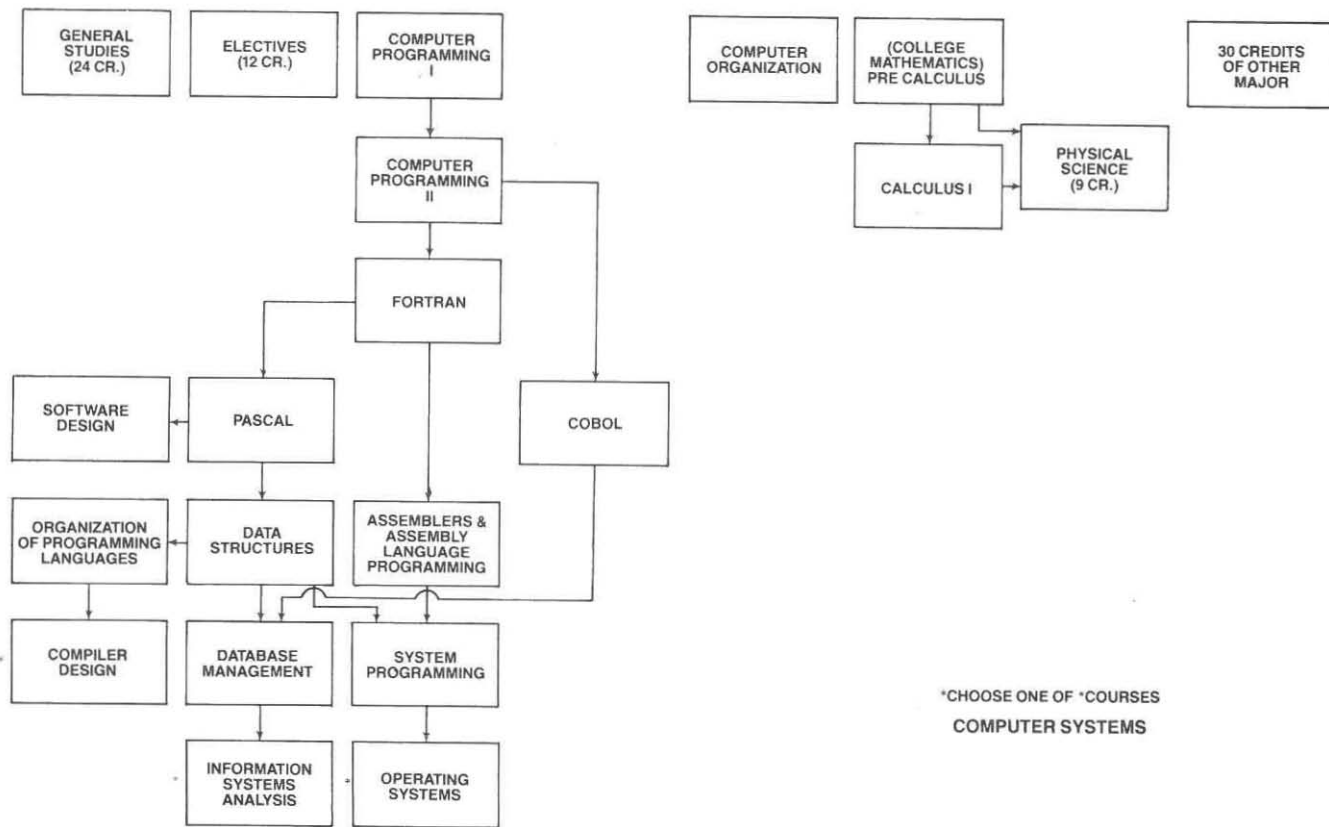
*CS 480 Intro to Compiler/Interpreter Design 3

OTHER REQUIREMENTS:

Thirty (30) credits must be taken in another description such as Business Psychology, Socialwork, Journalism, Health Care, Science.

ELECTIVES 12

*Choose one of *courses



BACHELOR OF SCIENCE/MAJOR IN COMPUTER SYSTEMS-TECHNICAL COMMUNICATION

An option in technical communications has been developed for those students who wish to learn how to develop technical material as well as have a solid foundation in Computer Science. This program focuses on understanding programming techniques and the operation of computer systems along with courses in technical communications.

GENERAL DISTRIBUTION REQUIREMENTS

Communications (6 cr.) (LAN 111 and LAN 112)

Humanities (6 cr.)

Social and Behavioral Sciences (12 cr.)

MATHEMATICS REQUIREMENTS

MAT 150	Precalculus	3
MAT 210	Calculus I	3

PHYSICAL SCIENCE or LIFE SCIENCE REQUIREMENTS 9

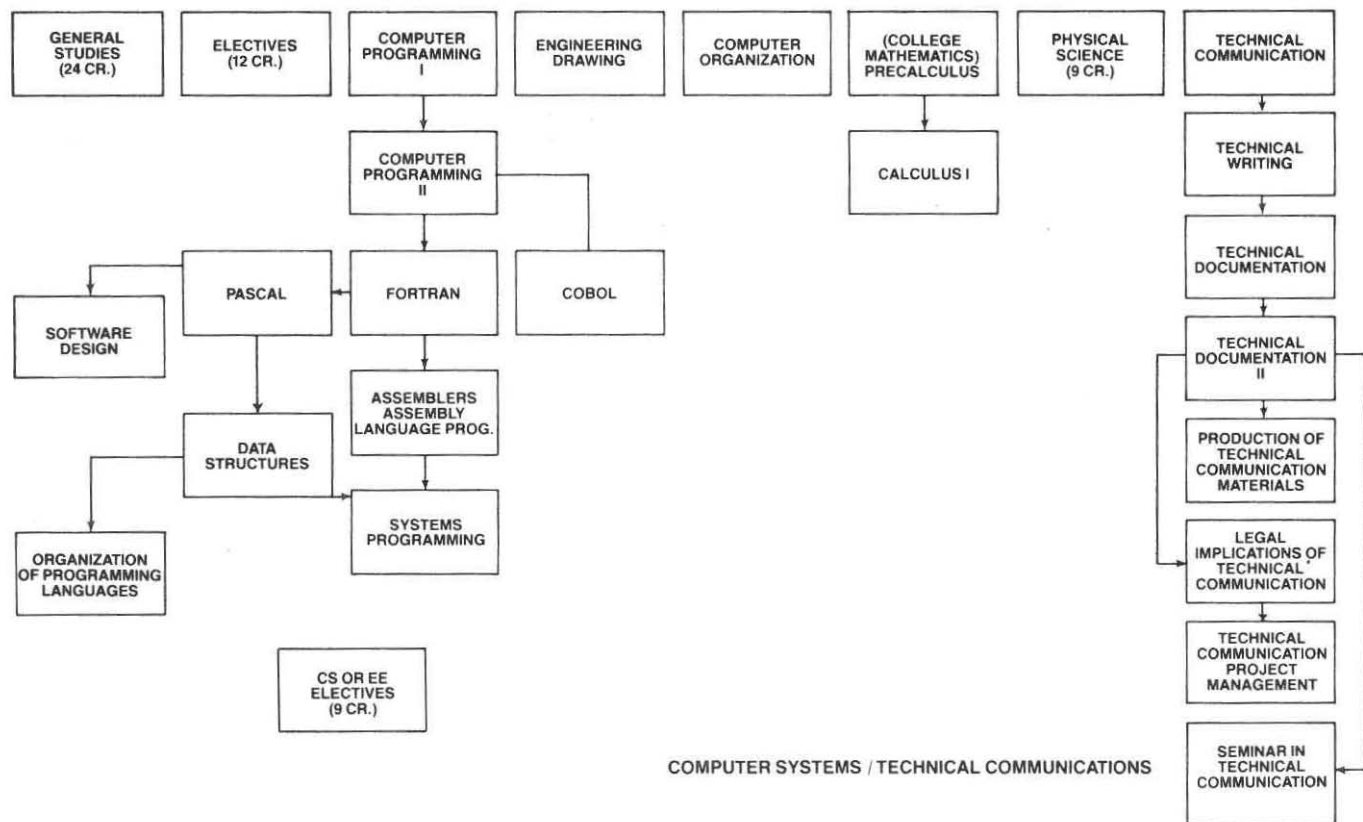
COMPUTER SCIENCE REQUIREMENTS

CS 150	Introduction to Computer Organization	3
CS 170	Computer Programming I	3
CS 200	Computer Programming II	3
CS 210	FORTRAN	3
CS 220	COBOL	3
CS 320	Organization of Programming Languages	3
CS 330	Structured Programming (PASCAL)	3
CS 335	Assemblers & Assembly Language Programming	3
CS 340	Data Structures	3
CS 370	Software Design	3
CS 460	System Programming	3

TECHNICAL COMMUNICATION REQUIREMENTS

ES 220	Engineering Drawing	3
TEC 320	Technical Communication	3
TEC 330	Technical Writing	3
TEC 350	Production of Technical Communication Materials	3
TEC 370	Technical Documentation	3
TEC 380	Technical Documentation II	3
TEC 450	Legal Implications of Technical Communication	3
TEC 460	Technical Communication Project Management	3
TEC 470	Seminar in Technical Communications	3

Elective credits chosen from courses with prefix CS or EE	9
Electives	12



COURSE DESCRIPTIONS

All courses are 3 semester hours credit unless otherwise noted.

GRADUATE

ICS 610 Computer Systems Introduction to digital computer design, peripheral devices, storage allocation, operating systems, compilers and assemblers. An understanding of the total operating environment will be developed. Investigation of the common programming techniques and their theory. Segmentation and overlays, recursion, dynamic storage processing, (stacks, queues, trees), macros. **Prerequisite:** Consent of instructor.

ICS 616 Theory and Principles of Programming The mathematics of algorithm and programming construction. The art of structured programming. The dynamic environment of a program and its record of execution. The theory of concurrent programming. **Prerequisite:** ICS 630.

ICS 618 Systems Programming and Project Implementation/3/6/9 sem. hrs. Participation in the implementation of an Industrial, business or University Project requiring the know-how of system's programming. Variable number of credits. **Prerequisite:** ICS 630.

ICS 620 Graph Theory Finite Linear graphs. Applications to modelling optimization, networks, operating systems design, digital design. **Prerequisite:** ICS 630.

ICS 622 Complexity Theory A general theory of computational complexity. Theory of algorithms. Turing Machines, Unsolvability problems. Exponential difficulty, NP-Completeness. **Prerequisite:** ICS 620.

ICS 624 Operations Research Analytic formulation and solution of decision problems using mathematical techniques. Linear and dynamic programming. Queuing, searching, maximizing/minimizing techniques. Scheduling and Inventory models, forecasting and time series analysis. **Prerequisite:** ICS 630.

ICS 625 Numerical Analysis Introduction to error analysis, iterative methods, eigenvalue problems; integration and differentiation by computer, interpolation, ill conditioned problems. Nonlinear systems. Boundary value problems. **Prerequisite:** ICS 630.

ICS 626 Modelling and Simulation Introduction to modeling techniques. Discrete events systems. Development of models (e.g. mathematical) of physical processes. Use of simulation programs such as SIMULA, GPSS, and SIMSCRIPT. **Prerequisite:** ICS 624.

ICS 630 Programming Languages Introduction to data structures and data types, and understanding of the modern approach to structured programming will be developed. A comparative study of several high-level programming languages. Emphasis will be placed on how concepts are expressed in each of the major languages, such as FORTRAN, COBOL, PL/I, PASCAL, and ALGOL. **Prerequisite:** Consent of instructor.

ICS 632 Language Theory and Automata Introduction to formal grammars, Backus-Naur notation. The formal theory behind the design of a computer language is studied. The corresponding types of automata which may serve as recognizers and generators for a language will be described. **Prerequisite:** ICS 630.

ICS 634 Compiler Design Theory Language theory will be applied to the design of a compiler for a high-level language. Parsing, syntax analysis, interpretation phase and code generation. Other areas of the compilation process will be covered, such as storage allocation, symbol table management, searching and sorting, and recursion. **Prerequisite:** ICS 632.

ICS 635 Compiler Implementation Design, implementation, and testing of a compiler for a high-level language. **Prerequisite:** ICS 634.

ICS 640 Digital Computer Design Principles and techniques of digital computer design. Integrated circuits, logic design, LSI and MSI design, sequential circuit analysis. Processor logic design, arithmetic unit, memory systems, input-output structures, micro-programming. **Prerequisite:** ICS 630.

ICS 645 Integrated Computer Systems (VLSI) Introduction to MOS circuits. The technology of integrated systems. Design of elementary components and subsystems (shift registers, dynamic registers, stacks). Fabrication process and implementation procedures. The design of an Integrated Computer (Data path, controller, micro-programmed control), System timing. Processor arrays. The physics of Integrated systems. **Prerequisite:** Consent of instructor.

ICS 646 Array Processors and Supercomputers An introduction to supercomputers. Parallel Computer Organization. Pipeline, associative and array computer architectures. Examples: Texas Instrument ASC, Control Data STARAN, CRAY-I, Burroughs BSP. Control and parallel processors. Stream of micro-instructions. Conflict free memory. Algorithmic detection

of parallelism. Vectorizing compiler. Array operations. Bitvectors. Analysis of recurrent relations. Control flow graphs. **Prerequisite:** ICS 630.

ICS 647 Concurrent Programming Languages (ADA, MODULA and SIMULA-67) An introduction to concurrent programming languages. Modules and class concepts in MODULA and SIMULA-67. Compilation units, subprograms, module structures, packages and concurrent tasks in ADA. Generic procedures. Concurrent programming, mailbox tasks, signals and semaphores. Abstract data types, operations on abstract objects, hiding of the representation of objects of a given type, private data types. **Prerequisite:** ICS 630.

ICS 650 Operating Systems Theory and Design Analysis of computer operating systems with emphasis on structured design. Multi-programming and multi-processing, real-time, time-sharing, networks, job control. Scheduling, synchronization and other forms of resource management: I/O programming, memory and file system management. **Prerequisite:** ICS 630.

ICS 651 Operating Systems Implementation Implementation and testing of operating system design on actual hardware. **Prerequisite:** ICS 650.

ICS 656 Network Design and Analysis Distributed processing and other forms of network systems. **Prerequisite:** ICS 630.

ICS 658 Data Communications An introduction to basic data communication concepts, coding modes and types of transmissions, multiplexing, line protocols, switching techniques and communication satellite technology. **Prerequisite:** ICS 656.

ICS 660 Data Base Management Computer-oriented techniques for information storage and retrieval with emphasis on on-line capability. File structures, including data definition and manipulation languages. **Prerequisite:** ICS 630.

ICS 675 Systems Performance Evaluation An analysis of the computer resources in a monitoring environment. CPU, I/O Channel, memory and mix utilization statistics. Hardware monitors and software monitors. Determining the overloaded computer system Capacity analysis. **Prerequisite:** ICS 630.

ICS 680 Microprogramming and Microprocessors The past, present and future of Microprogramming will be discussed in detail with particular attention given to Processor Technology. An in-depth survey of commercially available microprogrammable microprocessors will be presented as well as monolithic microprogrammed devices. The students will implement a processor instruction set in both vertical and horizontal

microcode utilizing a Simulator, Micro-assembler, and Register Transfer language. Advanced topics in special-purpose processor design and architecture redefinition (dynamic) will be presented. **Prerequisite:** Consent of instructor.

ICS 690 Software Engineering This course offers a thorough analysis of the problems related to the design, development and implementation of Software Projects. First, the fundamentals of Software project management are presented, followed by a discussion of the techniques of Software development. A comprehensive, modern approach to structured programming, program modularization and program correctness is offered. Software Verification and Validation, Software security and Software protection will also be analyzed in detail. **Prerequisite:** Consent of instructor.

ICS 691 Software Engineering Implementation The techniques of software engineering will be applied to practical projects. **Prerequisite:** ICS 690.

ICS 692 Advanced Topics Seminar This seminar will focus on topics of mutual interests to faculty and students.

ICS 694 Management in Data Processing Develops an awareness of the task of the manager of a data processing activity. The course introduces the student to the techniques and responsibilities of the manager in order to develop a better working relationship. **Prerequisite:** ICS 630.

ICS 695 Management in Data Processing Practicum The techniques of data processing management will be applied to practical examples. **Prerequisite:** ICS 694.

ICS 696 Management of Research and Development This course analyzes the role of R&D in the company, its relation to other activities. The planning and organization of R&D, its control and evaluation. **Prerequisite:** ICS 630.

UNDERGRADUATE

CS 111 Computer Literacy. Introduction for the non-technical person. Computer literacy, principles of computer operation, uses of computer in small business, schools, social service agencies, hospitals. Hands-on experience with micro-computers and specialized software. This course is for non-computer science majors.

CS 112 Introduction to Data Processing. (BUS 3801, CS 101) Topics include basic computer theory, file storage media input devices, number systems and programming techniques. This course is for non-computer science majors.

CS 150 Introduction to Computer Organization An Introduction to principles of digital computer operation and organization, data representation, the central processing unit, memory, input/output devices, number systems, logic systems. **Prerequisite:** demonstrated competency equivalent to MAT 102.

CS 160 Fundamentals of Logic Design (Formerly called Digital Systems) An introduction to elementary digital logic circuits, Boolean algebra, Karnaugh maps, digital counters, other basic circuit elements. Number set modules, binary, octal and hexadecimal number systems are investigated and related to digital computing structures. **Prerequisite:** demonstrated competency equivalent to MAT 102.

CS 170 Computer Programming I An introduction to good programming techniques including flowcharting, code design, debugging techniques and documentation, problem-solving methods and algorithm development to be used in the design of computer programs. The language, BASIC, will be taught as part of this course. An introduction to the use of microcomputers and computer terminals. **Prerequisite:** demonstrated competency equivalent to MAT 102.

CS 200 Computer Programming II Continuation of Computer Programming I including introduction to random and sequential files, program design, modular design, structured programming, large programming design, documentation. **Prerequisite:** Computer Programming I.

CS 201 Programming Methods (CPS 101) Intended to provide students with an understanding of the basics of computer programming. How to flow chart, program in basic, and implement and debug programs in basic. This course is for non-computer science majors. **Prerequisite:** CS 111 or CS 112.

CS 202 Programming Methods II Continuation of CS 201.

CS 210 FORTRAN Introduction to the language FORTRAN with reference to the latest standards, special techniques for programming in FORTRAN. **Prerequisite:** Computer Programming II, demonstrated competency equivalent to MAT 102.

CS 220 Business Oriented Language (COBOL) A study of the COBOL programming language with emphasis on business applications. Topics covered

will include program structure and breakdown, report generation and file handling. **Prerequisite:** Computer Programming II.

CS 240 Digital Design Application of the principles of logic design in digital systems. Arithmetic logic units, parallel and serial interfaces, information transfer in a digital system, major hardware components and peripheral devices, digital computers. **Prerequisite:** Fundamentals of Logic Design.

CS 291 Special Topics in Computer Science Topics in computer science that are not included in regular course offerings and may be taken without prerequisites. Specific content is announced in the course schedule for a given term. Students may re-enroll for Special Topics covering differing content.

CS 310 Programming Techniques Advanced programming techniques including algorithm analysis, structured programming techniques, program design, large program development and management. **Prerequisite:** Computer Programming I.

CS 320 Organization of Programming Languages Development of an understanding of the organization of programming languages, introduction to formal study of programming language specification and analysis, comparison of two or more high level modern programming languages. **Prerequisite:** FORTRAN, PASCAL, Data Structures.

CS 330 Structured Programming (Pascal) Basic principles of structured programming and language foundation. PASCAL will be taught as an example of a structured programming language. **Prerequisite:** Computer Programming II and FORTRAN.

CS 335 Assemblers and Assembly Language Programming A detailed analysis of the operation of assemblers. Assembler features, assembly language programming, macro facilities, Assembly language programs will be written as part of this course. **Prerequisite:** FORTRAN.

CS 340 Data Structures (formerly I & II) Introduction to the concepts and techniques of structuring data on bulk storage devices, introduction to data structures and file processing including arrays, records, strings, lists, trees, stacks, queues and manipulation and limitations of files. **Prerequisite:** Computer Programming II, PASCAL.

CS 350 Computer Circuit Design Design of combinational and sequential digital circuits, programmable logic design, and firmware design. **Prerequisite:** Digital Design.

CS 360 Computer Architecture The analysis and design of computer systems; the interrelation of software and hardware design in the final computer system, interrelation between the operating system and the architecture of computer systems, concurrent processes and resource allocation. **Prerequisite:** Computer Circuit Design. **Suggested prerequisite:** Assemblers and Assembly Language Programming.

CS 370 Software Design Algorithm analysis, software design, management of large software projects, functional specification, design and testing phase of large scale projects, quality control. **Prerequisite:** PASCAL.

CS 401 Organization of the Computer Environment Management of the computer environment, personnel, customer interface, budgeting, coordination, policy development, staffing, department interface, hardware and software selecting, planning, maintenance, and management. **Prerequisite:** Requires Senior standing.

CS 410 System Design & Analysis Advanced topics in design of digital computer systems and components. **Prerequisite:** Computer Architecture.

CS 420 Operating System Concepts Methods in the analysis and design of large scale systems, including concepts of semaphores, processes, linear address space, resource allocation, protection and basic topics in operating system development. **Prerequisite:** Data Structures, Systems Programming.

CS 430 Simulation and Modeling Construction and use of complex models on digital computers; structures of simulation language, verification and validation of models, statistical analysis of results. Students will design and run a number of simulations. **Prerequisite:** FORTRAN and PASCAL.

CS 440 Microcomputers Design elements of microcomputers including both hardware and software aspects.

CS 450 Data Base Management Systems Design Concepts and structures necessary to design and implement a database management system, including physical file organization and data organization techniques, data models, networks, data integrity and file security. **Prerequisite:** Data Structures, COBOL.

CS 460 Systems Programming A study of various system programming techniques, hardware-software interface, software controlled hardware. A comparison of several existing computer systems will be made. **Prerequisite:** Assembly Language, Data Structures.

CS 470 Information Systems Analysis and Design Information processing systems, project planning, software package. **Prerequisite:** Data Base Management.

CS 480 Introduction to Compilers and Interpreters An introduction to compiler/interpreter design. Topics include lexical analysis, parsing, intermediate code, final code generation, optimization, and error recovery. **Prerequisite:** Organization of Programming Languages.

CS 485 Theory of Computation Theoretical approach to computer science. Topics include correctness, automata and Turing machines, finite state machines, grammars. **Prerequisite:** FORTRAN, Calculus I.

CS 490 Directed Project in Computer Science A major project in computer science will be completed by the student under the direction of a faculty member. **Prerequisite:** Requires Senior standing.

EE 210 Networks I Definitions of charge, current voltage, energy, Ohm's Law, Kirchoff's Law, networks, resistance, voltage, current power, nodal analysis, mesh analysis, principle of superposition, power transfer, Thevenin and power theorems. Two port networks. **Prerequisite:** Calculus I.

EE 255 Electricity Laboratory Basic laboratory to complement Networks theory courses.

EE 310 Networks II A.C. circuit theory, capacitance, inductance, source free RL & RC circuits, application of unit step forcing function, RLC circuits, sinusoidal analysis, phasor sinusoidal steady state response. Polyphase circuits, average power and RMS power. **Prerequisite:** Calculus II, Networks I.

EE 330 Electronics I Physical theory and analysis of semi-conductor properties, circuits containing non-linear elements, semi-conductor diodes, zener diodes, conduction in semi-conductors, transistor characteristics, large system signal analysis, small models, single-stage amplifiers. **Prerequisite:** Networks I.

EE 335 Electronics Lab I — (1 cr.) Laboratory work to complement electronics theory course. **Prerequisite:** Electronics I.

EE 340 Electronics II Multi-stage amplifiers, difference and Darlington amplifiers, properties of feedback, feedback amplifiers, integrated circuits, high-and-low frequency analysis of single and multi-stage amplifiers, frequency response of feedback amplifiers, analyze p-n diodes using transistor models for design and analysis. Basic concepts of electronic design. **Prerequisite:** Electronics I, Networks II.

EE 345 Electronics II Lab—(1 cr.) Lab work to complement electronics theory course. **Prerequisite:** Electronics I Lab, Electronics II.

EE 400 Electronics III Passive and wave-shaping circuits, logic circuits, multi-vibrators and blocking oscillators, investigation of limitations, advantages and methods employed in integrated technology, solution of problems in electronic analysis and in electronic design. **Prerequisite:** Electronics II, Networks III, Calculus III and Differential Equations.

EE 405 Networks III Continuation of Networks II to include Fourier transforms and Z-transforms, magnetic coupling, introduction to filter theory, and advanced topics in Networks Theory. **Prerequisite:** Networks II, Calculus III, Differential Equations.

EE 410 Electromagnetic Theory Fundamentals of static, electric and magnetic fields, electro-quasistatics, potential and voltage, charge singularities, boundary conditions, as well as Maxwell's equations in cartesian, spherical and cylindrical coordinates, subject to give boundary conditions, Ampere's law, Gauss' law, electric and magnetic functions. **Prerequisite:** Physics II, Calculus III, Differential Equations, Networks II.

EE 420 Field Transmission Lines Plane waves in free space and in uniform homogeneous media, reflection and transmission at multiple interfaces, non-normal incidence, Poynting theorem, time averages. Power, energy and dissipation; wave guides and cavities, groups and phase velocities, wall loss attenuations, T & M waves in Z-conductor transmission line, antennas, radiation, design of transmission lines. **Prerequisite:** Electromagnetic Theory.

EE 430 Fundamentals of Communication Systems Review of Fourier analysis, various methods for modulating and demodulating signals, calculating effects of noise on single transmissions, sampling theory and digital data transmission, design of various types of communication systems, transmission lines and microwaves; mathematical description of noise, fundamentals of information theory as applied to communications. **Prerequisite:** Networks III, Electronics II.

EE 440 Energy Systems Conversion of energy between electrical and other forms: electromechanical, electrochemical, photoelectric, thermoelectric and other methods of conversion are studied, transmission of electric power, design problems in energy systems. **Prerequisite:** Physics I, Physics II, Physics III, Networks II and Electronics I.

EE 450 Control Systems An introduction to the fundamental principles and main ideas of classical feedback control and its applications including design of con-

trol systems. Differential equations of servo-mechanisms using frequency domain techniques. Frequency response, transfer functions, analog techniques for treating automatic control systems analysis of performance over techniques, performance criteria, stability criteria, design of linear feedback systems, introduction to non-linear feedback systems. **Prerequisite:** Networks III, Energy Systems.

EE 460 Micro-Electronics Physical, economic and reliability considerations. Properties of silicon wafers, thin film and diffusion processes, mesa and planar transistors, epitaxial techniques, photochemistry and wafer processing, design rules for monolithic integrated circuits, assembly and testing. Applications in the design of basic differential amplifier circuits: dc, audio, video, IF, RF and operational amplifiers. Discriminators and limiters, digital logic modules, system design characteristics. **Prerequisite:** Networks II, Electronics III.

EE 470 Electrical Engineering Design Application of design techniques to special projects in Electrical Engineering. **Prerequisite:** This is a senior-level Electrical Engineering course and requires that most Electrical Engineering and Electronic courses be completed.

ES 220 Engineering Drawing Introduction to the use and preparation of engineering graphics including basic drawing techniques, dimensioning of orthographic drawings, auxiliary and oblique views sectional drawings, working drawings, blueprint readings, freehand sketching, methods and symbols.

ES 310 Engineering Applications of Materials Basic concepts of material structure and their relation to mechanical, thermal, electrical, magnetic and optical properties with engineering applications. Simple stress and strains, thermal stresses, pure torsion, shearing force, bending moment, combined stresses. **Prerequisite:** Physics I, Physics II, Physics III, Calculus II.

ES 320 Industrial Planning An introduction to industrial processes and planning, development of cost, time and material estimates, production planning, procurement. **Prerequisite:** must have Junior standing.

ES 330 Statics Equilibrium of coplanar force systems; analysis of frames and trusses, friction, non-coplanar force systems, centroids and moments of inertia. **Prerequisite:** Physics I, Calculus II.

ES 340 Dynamics Measurement and calculation of dynamic forces and motions, relative motion, kinetics of translation, rotation and plane motion, work-energy, impulse-momentum. **Prerequisite:** Physics I, Calculus II, Statics.

ES 390 Thermodynamics First and second laws of thermodynamics, application to fluid dynamic processes,

energy conversion cycles and combustion phenomena, the reversible processes, characteristics of gases, mixtures of gases and vapors with thermodynamic equilibrium considerations. **Prerequisite:** Physics I, Physics II, Physics III, Calculus II.

MAT 092 Foundations of Mathematics A basic course which will prepare the student for college level mathematics courses. Students not achieving all of the required competencies will receive a grade of PR and may re-enroll. Credit does not count toward graduation.

MAT 102 Introductory Algebra A basic review of algebra including algebraic terminology, polynomials, and applications. Appropriate for non-match and non-science majors.

MAT 105 College Algebra (MAT 3002) Includes topics such as fundamental operations, functions and graphs, linear and quadratic equations, and conic sections.

MAT 150 Precalculus (Formerly called College Mathematics) Review of algebra, trigonometric functions, graphs of functions, logarithms, exponents, functions of the natural number, introduction of calculus, concept of limits, integrals.

MAT 201 Finite Math Study of mathematical concepts and models and their practical application to problem solving techniques in the areas of business, social science and economics. The main topics covered in this course will be review of algebra, graphs of functions, permutations, combination, probability, probability distributions, linear equations and an introduction to statistics.

MAT 210 Calculus I Functions, limits, derivatives of algebraic functions. Introduction to derivatives of trigonometric functions, logarithmic functions, application of derivatives to physics problems, related rates and maximum/minimum problems, definite and indefinite integrals with applications.

MAT 220 Calculus II Riemann sums, the definite integral methods of integration, continuation of exponential logarithmic functions. Inverse trigonometric functions. L'Hopital's rule, and improper integrals. **Prerequisite:** Calculus I.

MAT 305 Calculus III Sequences and series. Taylor series, vector analysis functions of several variables, partial derivatives, total differential chain rule, multiple integral and application functions of a complex variable. **Prerequisite:** Calculus II.

MAT 310 Differential Equations Solving first order ordinary differential equations, exact, separable and

linear. Applications to rates and mechanics, theory of higher order linear differential equations. Methods of undetermined coefficients and variation of parameters, application to vibrating mass and electric circuits; power series solutions. Partial differential equations: the methods of separation of variables, linear partial differential equations and their application to electronics and electrical engineering problems, solutions of initial boundary problems. Fourier series and Fourier transforms; inhomogeneous problems, introduction of numerical methods. Laplace transforms. **Prerequisite:** Calculus I.

MAT 320 Advanced Calculus Infinite series and sequences, uniform convergence, vector functions of several variables, the Jacobian matrix, inverse function theorem, the Laplacian in cylindrical and spherical coordinates. Lagrange multipliers, Vector differential and integral calculus including Green's, Stokes' and Gauss' theorem. The change of variable in multiple integrals. **Prerequisite:** Calculus III.

MAT 360 Matrices and Statistics Systems of linear equations, matrix algebra, determinants, eigenvalues and eigenvectors, applications to differential equations; introduction to statistics. **Prerequisite:** Calculus II.

MAT 420 Linear Algebra Matrices and systems of linear equations, vector spaces, linear transformations, determinants, eigenvalues and eigenvectors, canonical forms, inner product spaces. **Prerequisite:** Calculus II or Equivalent.

MAT 430 Functions of a Complex Variable The general theory of functions of a complex variable, analytical functions, the Cauchy-Riemann equations, the Cauchy integral theorem and formula. Taylor series. Laurent series, singularities and residues, conformal mappings with application to problems in applied science and engineering. **Prerequisite:** Calculus III.

MAT 440 Numerical Analysis Solution of algebraic and transcendental equations by a number of iterative methods including discussion of convergence considerations, probability and statistical theory, numerical integrator of a number of types of problems will be discussed both in theory and in practice through the use of computer problem-solving. **Prerequisite:** Calculus II and some competency in Computer Programming.

MAT 450 Probability and Statistics Probability function, random events, expectation, conditional probability, distribution functions, foundations of statistics. **Prerequisite:** Calculus I.

PHY 101 Introduction to Physical Sciences A survey course in physical sciences for non-science

majors. Topics include the concepts of motion, electricity and light, matter, atoms and nuclei and the solar system.

PHY 103 Introduction to Geology An introductory course that will provide an understanding of the earth's composition and structure; an explanation of the processes that affect the earth and the resulting features; a description of the physical evolution of the major mountains and oceans; a description of biological evolution in relation to ancient geologic environments; and an analysis of earth's resources and implications for the future.

PHY 140 Physics I Basic principles of mechanics including vectors, force, equilibrium, displacement, velocity, acceleration, mass, Newton's Laws, work energy, gravitation, momentum, rotational motion, mechanics of systems of particles and rigid bodies. **Prerequisite:** Calculus I.

PHY 150 Physics II Electrostatics, electric currents, electric fields and electric potential AC and DC circuits, magnetic fields, capacitance inductance and electromagnetic waves. **Prerequisite:** Calculus I.

PHY 160 Physics III Thermodynamics, entropy, wave motion & optics, temperature, heat and kinetic theory, reflection and refraction of light, interference and diffraction polarization radiation. **Prerequisite:** Calculus I.

PHY 212 Science of Matter Introductory course in the science of materials, review of atomic theory, atomic bonding and periodic table, chemical equations, states of matter, structure of crystals, nature of crystal imperfections and atom movements; metallic and ceramic materials and their properties; multiphase materials, equilibrium relationships. **Prerequisite:** Physics I, II, III.

PHY 220 Introduction to Astronomy An introduction to astronomy which examines in brief both solar system and the universe. Topics include: fundamentals and history of astronomy, study of the earth, moon, planets, and optical instruments used in astronomy. In addition, the sun, stars, galaxies, and cosmology are also examined.

PHY 226 Conservation of Natural Resources Study of the natural resources within the framework of the man-environment system. Included are problems related to pollution, populations, technology, growth, conservation of the environment and developmental planning as they relate to the various geographic areas of the western and non-western world. **Identical to GEO 226.**

PHY 291 Special Topics in Physical Science Topics in physical science that are not included in regular course offerings and may be taken without prerequisites. Specific content is announced in the course schedule for a

given term. Students may re-enroll for Special Topics covering differing content.

PHY 310 Modern Physics An introduction to modern concepts of physics including atomic structure and microscopic structure of matter, quantum mechanics, elementary particles, special relativity, wave particle duality, statistical physics, X-rays, molecular binding, nuclear physics, including nuclear structure. **Prerequisite:** Physics, I, II, III, Calculus I.

TEC 320 Technical Communications Technical vocabulary, methods for developing technical materials, skills for presenting technical material to both technical and non-technical audiences, oral presentations of technical material. **Prerequisite:** LAN 311 Business Communication or demonstrated competency on Nova College examination.

TEC 330 Technical Writing Basic techniques of technical writing, techniques for writing reports, description of processes, instructions, proposal and progress reports and oral presentations. **Prerequisite:** LAN 311 Business Communication or demonstrated competency on Nova College examination.

TEC 350 Production of Technical Communication Materials Production techniques for various forms of media used in technical communication including print, slide, tape, videotape.

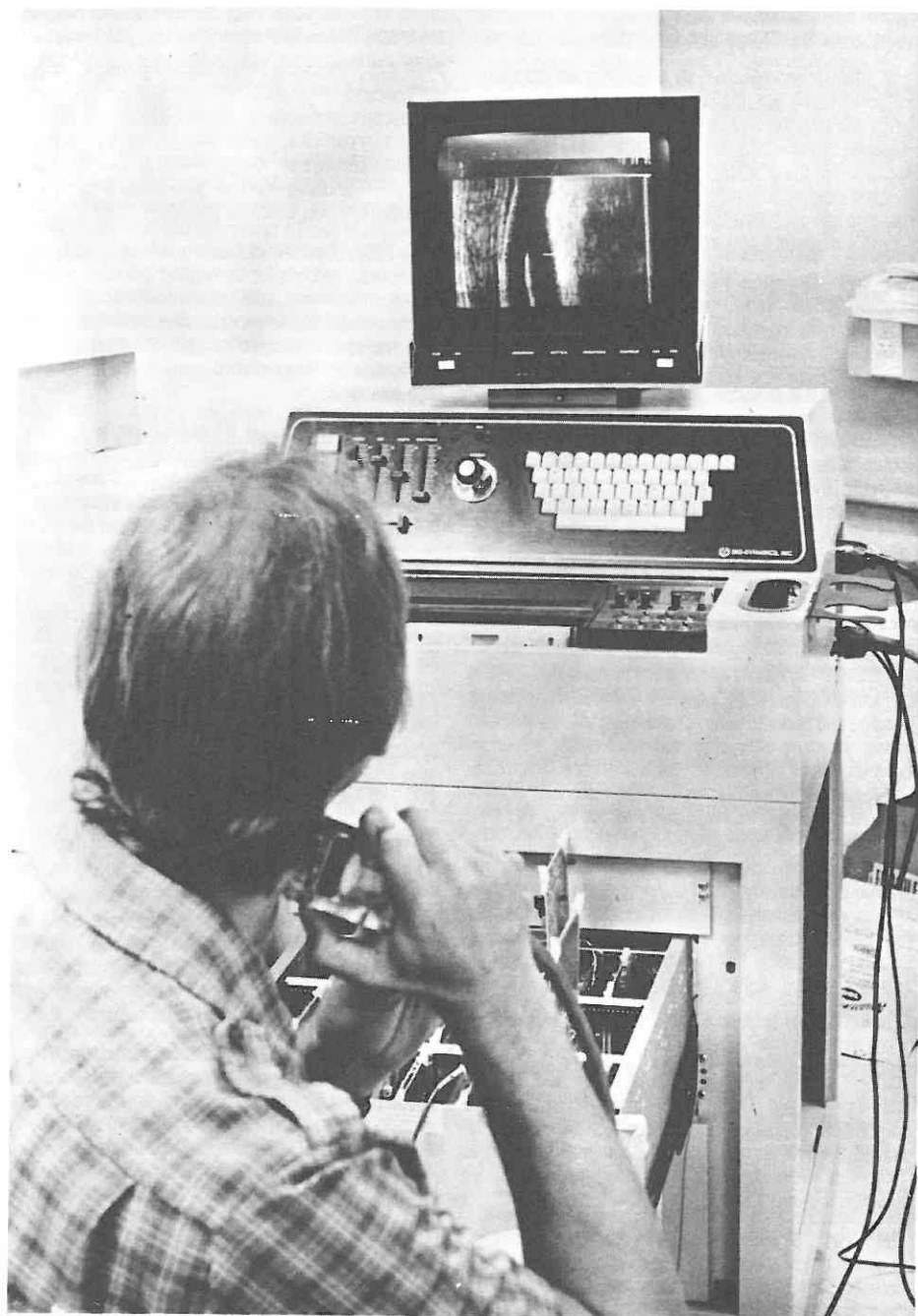
TEC 370 Technical Documentation I Development of technical documentation material and analysis of documentation, techniques for testing, the validation process and quality control, technical editing. **Prerequisite:** TEC 330 Technical Writing.

TEC 380 Technical Documentation II Continuation of TEC 370. **Prerequisite:** TEC 370.

TEC 450 Legal Aspects of Technical Communication A discussion of the legal requirements of technical documents, implications of technical communication material, releases, copyright, contracts and implied warranties, international aspects of technical communications. **Prerequisite:** Technical Documentation II.

TEC 460 Technical Communication Project Management Management of the technical communication project including scheduling, time management of various stages, budget, and management of interdepartment interfaces, inter-company interfaces and international interfaces. **Prerequisite:** Technical Documentation II, Legal Aspects of Technical Communication.

TEC 470 Seminar in Technical Communications Advanced topics in technical communications including quality control. **Prerequisite:** TEC 380 Technical Documentation II.



**Academic Centers and
Major Programs
of Study**

The Center for the Study of Administration The Center for the Study of Administration offers a variety of programs at the doctoral and master's degree levels that stress innovative learning processes and delivery systems for working professionals who wish to increase their administrative or managerial effectiveness.

The major programs offered at the master's degree level are: the Master of Business Administration (MBA) which thoroughly develops the quantitative skills used in management; the Master of Public Administration (MPA) designed for persons aspiring to management positions in public and community service agencies; the Master of Science in Criminal Justice (MSCJ) for persons in law enforcement and corrections agencies; the Master of Science in Human Resource Management (MSHRM), which is built on a foundation of behavioral science, is for managers who are responsible for such functions as organizational staffing, affirmative action and equal opportunity requirements, management education, and development or career planning. There are also various majors that may be taken in conjunction with the MBA, MPA, and MSHRM degrees, such as accounting, computer systems management, criminal justice, health management, and procurement and contract administration. In conjunction with the Center for the Study of Law, the Center awards the MBA along with the JD for those students who complete the core requirements. The JD and MBA joint degrees are of special value to attorneys who anticipate a career in a large organization or corporation.

The Center's two doctoral level programs address both public and private sector management. The Doctorate in Public Administration (DPA) is national in scope, is offered in several states, and is built around a senior faculty drawn from key government and academic centers throughout the United States. The degree is designed to broaden the professional competence of practicing administrators in the public sector. The DPA curriculum addresses the environment, processes, techniques and methods of public management and provides, through participant clinical or laboratory experience, direct learning in the key functions, systems, and roles involved in the administration of public institutions and enterprise at all levels of government. The degree content is guided by the standards set by the National Association of Schools of Public Affairs and Administration (NASPAA).

The Doctorate in Business Administration (DBA) prepares people for careers in high-level teaching, research, or managerial positions. The DBA curriculum covers the spectrum of foundation knowledge, both quantitative and behavioral, represented by the professional divisions and special interest groups of the Academy of Management.

In addition, through its Government Assistance Service, the Center seeks to promote efficient and economical methods of administering local government and other public bodies. It helps develop programs based on

knowledge and consideration of the needs and resources of the particular community. The Center also provides an Urban Workshop where the application of system dynamics to local and state administrative issues can be undertaken by practitioners and research persons.

Behavioral Sciences Center The Behavioral Sciences Center focuses on the study of man.

The Department of Psychology offers the Ph.D. in clinical psychology. This is a full-time on-campus degree program. The Master of Science degree is offered in counseling, gerontology, applied psychology, psychometry, school guidance. The Educational Specialist degree is offered in school psychology. The Master of Science degree programs in counseling, applied psychology and human services are offered at both on-campus and off-campus locations.



The Florida School of Psychology in Miami has become a component of the Behavioral Sciences Center of Nova University and will be called the School of Professional Psychology.

Established in 1977 in Miami, the Florida School of Psychology offered the Doctor of Psychology (Psy.D.) degree on a full-time basis to students seeking a career in psychology in a practitioner-oriented format rather than in a research-oriented manner. This degree, the Doctor of Psychology (Psy.D.), will now be offered by Nova University.

The Behavioral Sciences Center also operates, or is affiliated with, various institutes and clinics which provide facilities for research and service in the behavioral sciences. These include: The Nova University Clinic, Inc., The Children's Assessment and Treatment Program, The Biofeedback Clinic and Laboratory, The Institute of Social Services to Families (Foster Parent Project), The Family Center, and the Nova Research Institute.

Family Center The Family Center is a community resource located on the Nova Ft. Lauderdale/Davie Campus. The Center provides a network of programs and services designed to strengthen the family and enhance the quality of family life. It serves as a training facility for students in clinical and applied developmental psychology. The Family Center provides:

FAMILY PROGRAMS — a selection of courses and programs for families with young children.

CLINICAL PSYCHOLOGY — psychological services on a sliding fee basis to community residents. Services include psychological and psycho-neurological assessment, individual therapy, and family and group therapy.

EDUCATION — educational and learning disability assessment, private and small group tutoring, learning disability remediation and college board preparatory classes.

PROFESSIONAL DEVELOPMENT — courses, workshops, and consultative services to child-care practitioners and professionals working with families.

PRODUCT AND RESOURCES — resources devoted to children and their families. The Family Resource Library is open to the public.

Nova University at Coral Springs Nova University established an educational center at Coral Springs specifically to meet the needs of men and women living in north Broward County and Palm Beach County. The uniqueness of this branch of Nova University is its community based mission. Classrooms and administrative offices are presently located at 3501 University Drive. Nova has recently purchased a permanent site for its university center in Coral Springs. It is located in the heart of the community services complex across from Mullins Park on N.W. 29th Street. Plans for the first building are in the process of development.

Undergraduate courses leading to the Bachelor of Science degree in a variety of majors are offered at Coral Springs. In addition to regular courses, the Alternative Classroom program offers undergraduate courses through television, newspaper and community research.

The Master of Science degree in counseling, school guidance, and gerontology is also available. Other graduate programs are in the planning stages. Continuing education courses and workshops are offered for personal enrichment and career development. Cooperating with community agencies, Nova University at Coral Springs is developing a full cultural program.

The Nova University Clinic, Inc. — a non-profit, publicly supported mental health clinic serving Northwest Broward — is located in the Coral Springs Center.

Center for the Advancement of Education The Center for the Advancement of Education is dedicated to the training and continuing support of teachers, administrators, trainers, and others working in education. These practitioners serve as the bridge between the knowledge base in education and the quality of education experienced by their students. The Center hopes to fulfill its commitment to the advancement of education by serving as a resource for practitioners and by supporting them in their self-development.

In accomplishing its mission, the Center offers educational programs designed to meet the needs of the working practitioner and makes a special commitment to provide educational programs in those geographical areas in which there are few resources for the training and for the professional support of practitioners in education.

Because of its commitment to the working professional, the Center offers alternative delivery systems for education that are adaptable to practitioners' work schedules and locations. Center programs reflect and anticipate the needs of practitioners to become more effective in their current positions, to fill emerging roles in the field, and to be ready to accept changing responsibilities within their own organizations. The Center also aids professional educators in achieving personal goals, including certification requirements.

The programs offered by the Center are:

MASTER'S PROGRAM FOR CHILD CARE ADMINISTRATORS

This program was developed for the administrator in for-profit and not-for-profit centers. The primary mode of instruction is independent study. Additional participant responsibilities include a special project and a summer institute.

GRADUATE EDUCATION MODULE PLAN (GEM)

The participants include teachers, administrators, and health educators seeking Master's and Ed.S. degrees, certification, and "redirection" credit in 19 majors. The learning experiences are organized into six and nine-credit modules.

MASTER OF ARTS IN TEACHING

This program is designed to prepare, for a career in teaching, the person whose undergraduate degree was not in education. The program's major components include the completion of modules in the GEM program and a full year internship at The University School of Nova University.

Ed.D. IN EARLY CHILDHOOD

The early childhood program is designed for those persons who are in leadership positions in the field of early childhood education, but participation is not limited to those in school-related positions; it is open to

The Center is the *only* school of law in Broward County, Florida, and it is one of two law schools in South Florida. It maintains the most extensive law library in Broward County.



The Law Center has responded to the need for continuing legal education. It provides educational experiences for lawyers consistent with the Florida Bar Association's mandating continuing attendance at legal enrichment courses by members of the practicing bar. Because the State of Florida is in the unique position of being at the hub of trade with South America, the Center provides programs to prepare attorneys to deal with the scope of international trade. Programs held at Oxford, England and Cali, Colombia have explored the comparative law of the United States and of Latin America. The Center has sponsored a major conference on Labor Law, as well as seminars on International Finance, Tax, and Marketing and the Revenue Act of 1978.

Biology Laboratories In conjunction with the Ocean Sciences Center, the biology laboratories now offer Ph.D. programs in a variety of sub-disciplines of the biological sciences. Students with master's degrees interested in research opportunities are encouraged to make inquiries.

The curriculum leading to the Doctorate in Biological Sciences is designed to utilize the unique facilities of the Biological Laboratories at the Oceanographic Center and the Goodwin Institute for Cancer Research in nearby Plantation, Florida. The program is oriented toward qualified students with an interest in cell biology with emphasis on oncology, immunology, virology, and biochemistry. Opportunities for field studies in marine biology and experimental cancer research in animals are noteworthy. Programs are formulated to meet the needs of the individual student. Candidates are expected to demonstrate evidence of scholarly work in the form of a dissertation based on laboratory research.

Microcomputer Laboratory The Microcomputer Laboratory provides courses and programs based exclusively on applied microcomputer technology. The laboratory is equipped with the latest versions of the most popular microcomputers. Its extensive software library provides opportunity for the study of the range of applications of software in word processing, simulation, computer-assisted instruction and other areas.

In addition to individual courses, two complete degree programs are offered—the M.S. and the Ed.S. in Computer Education—through the Center for the Advancement of Education. Through these offerings, teachers can gain the competencies needed to provide leadership in the rapidly increasing use of microcomputers in schools.

The Microcomputer Laboratory and its programs were designed and are administered by the Office of New Programs, which develops new program content as well as new delivery systems.

Nova College—Undergraduate Programs NOVA COLLEGE draws upon the extensive human and technological resources of the Nova University/New York Institute of Technology (NYIT) Federation in providing quality undergraduate programs. The College offers programs leading to the Bachelor's degree in accounting, business administration, community services and administration, computer science, computer systems, education, electrical engineering, mathematics, psychology, social science and professional management.

A Day Division is available to qualified, intellectually motivated high school graduates and high school students seeking an education with an emphasis on the liberal arts. All students participate in a comprehensive series of interdisciplinary courses which include experiential components and career orientation through the major. The academic year in the Day Division is 11 months divided into five terms of nine weeks each, permitting students to be enrolled in up to nine credits of time-intensive interrelated course work per term and allowing the completion of the B.A. or B.S. degree in three calendar years. Students who opt to enroll for any four of the five terms can still be considered full time. Some merit scholarships are available to Broward County residents.

The Career Development Program and the Center for Science and Engineering (see page 64) have been organized for adults. Courses are offered on campus in the evenings and on weekends. They are also offered at institutional, industrial, and other off-campus locations convenient to the student. Although course content is designed to meet traditional educational requirements, courses are scheduled to meet the needs of employed students and are taught utilizing a blend of university professors and knowledgeable practicing professionals in the community.

The Center serves as a demonstration facility as well as a training center for prospective and in-service teachers in the fields of early childhood, elementary and secondary education, reading, learning disabilities, and administration and supervision. Its programs and facilities are available to graduate students in the Behavioral Sciences Center and to education majors in the Center for Undergraduate Studies and the Center for the Advancement of Education for the purposes of research and degree-credit internships.

Center for School Leadership Development The Center for School Leadership Development offers the Doctor of Education degree as a field-based program through its National Ed.D. Program for Educational Leaders. The Program is currently being offered to candidates in 17 states. Open only to practicing elementary- and secondary-level school administrators, this program provides three years of targeted study, in which candidates must pass eight study areas, satisfactorily complete three performance-oriented practicums, and attend two summer institutes. Using such a structure, the Program seeks to develop the leadership skills of those able to apply their training immediately to the solution of real problems in the schools. By focusing on real life situations and school problems, the Program moves toward its goal of improving elementary and secondary schools.

Center for Science and Engineering The Center for Science and Engineering focuses its efforts in the area of science, mathematics, computer science and electrical engineering. Faced with a rapidly expanding body of technical knowledge, the Center serves three groups of individuals: the computer science or engineering major who is seeking to prepare for a career in technology, the non-major who needs some foundation in science and technology in order to function as an educated person in today's world, and the professional who needs continuing education to maintain his or her professional knowledge. Classes are offered at night and on Saturday in order to provide an opportunity for the working adult to pursue a professional degree. Electronic, microprocessor and microcomputer laboratories are available for instruction in addition to the University mainframe, a DEC 20. In addition, the Center draws on the resources of Nova's sister institution, the New York Institute of Technology. To provide this educational base to the community, the Center offers:

- The Master of Science, major in computer science, which is designed to give the student practical experience and in-depth knowledge of computer systems.
- The Bachelor of Science in Electrical Engineering, a well-defined professional degree program in which students focus on computer science in addition to the traditional electrical engineering courses.

- The Bachelor of Science, major in computer science, a program which has strong components in both hardware design and software development.

- The Bachelor of Science, major in computer systems, which combines both computer systems and business components.

- The Bachelor of Science, major in computer systems/technical communication, which combines courses in computer systems with those in technical communication.

- The Bachelor of Science, major in mathematics/computer programming which provides the student with formal education in mathematics and computer software development.

Additional undergraduate coursework and specializations are provided for the non-major.

The Center also offers a series of workshops which are designed to bring the latest technical information to professionals in the South Florida area. A Masters in Electrical Engineering is currently in the planning stage.

New York Institute of Technology, which offers programs in engineering and technology at three locations in the New York area, works closely with the center to make their programs and resources available in South Florida.

Nova University does not discriminate on the basis of handicap, sex, race, religion, national or ethnic origin in admission, access or employment for any of its programs and activities. The University Registrar and Director of Personnel have been designated as student and employee coordinators, respectively, to assure compliance with the provisions of the applicable laws and regulations relative to non-discrimination.

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B.S. University of Florida
Ph.D. University of Kansas

FACULTY SABATTICAL PROGRAM

Jan-Mar 1982

OTIS LANCASTER
B.S. Central Miss. State University
M.A. University of Missouri
Ae.E. California Institute Technology
Ph.D. Harvard University

*Shared with another Center

**Part-time Faculty

The provisions set forth in this bulletin are not to be regarded as an irrevocable contract between the student and Nova University. The regulations and requirements herein, including tuition and fees are necessarily subject to change without notice at any time at the discretion of the administration. The University further reserves the right to require a student to withdraw at any time, as well as the right to impose probation on any student whose conduct is unsatisfactory. Any admission on the basis of false statements or documents is void upon the discovery of the fraud, and the student is not entitled to any credit for work which he may have done at the University. Upon dismissal or suspension from the University for cause, there will be no refund of tuition and fees. The balance due Nova University will be considered receivable and will be collected.

A transcript of a student's academic record cannot be released until all his/her accounts, academic and non-academic, are paid.

Nova University maintains a system of records which includes application forms, letters of recommendation, admission test scores and transcripts of students previous academic records and Nova University transcripts. These records may be made available upon written request through the Office of Registrar. The law limits access and disclosure to a third party. Such access is given only upon consent of the student or if required by law.

A person does not have the right of access to educational records until he or she has been admitted and has actually begun attending Nova University. There is no prohibition from disclosing such information to the parents of students who are listed on their parents federal income tax forms.

Parents or eligible students will be provided a hearing by Nova University if they wish to challenge the content of the record. If still not satisfied, the parents or eligible student may add explanatory or rebuttal matter to the record. If the student or parents are denied access to a hearing or if records are alleged to have been illegally disclosed to a third party, the student or parents may file a complaint with the Family Educational Rights and Privacy Act (FERPA) Office, Room 4512, Switzer Building, Washington, D.C. 20202.

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