



STATE OF CONNECTICUT

BOARD OF TRUSTEES

FOR THE STATE COLLEGES

P. O. Box 2008 NEW BRITAIN, CONNECTICUT 06050
TEL. NEW BRITAIN: 203-229-1607 TEL. HARTFORD: 203-566-7373

RESOLUTION

concerning

BACHELORS DEGREE

in

COMPUTER AND INFORMATION SCIENCES

at

EASTERN CONNECTICUT STATE COLLEGE

January 9, 1981

- WHEREAS, In Board Resolution #79-66 the Board of Trustees granted Eastern Connecticut State College permission to submit a program proposal leading to a Bachelors Degree in Computer and Information Sciences to the Board of Higher Education, and
- WHEREAS, Eastern Connecticut State College has submitted an amended proposal, now, therefore, be it
- RESOLVED, That under the authority granted them in Chapter 164, Section 10-109 and Chapter 178, Section 10-325c of the Connecticut General Statutes, the Trustees reaffirm their approval for Eastern Connecticut State College to submit a proposal for a Bachelors Degree in Computer and Information Sciences to the Board of Higher Education for planning approval.

A Certified True Copy:

A handwritten signature in cursive script that reads "James A. Frost".

James A. Frost
Executive Director

APPLICATION SUMMARY
(For Coordination of Planning and Licensure of a New Program or Degree)

Description of Proposed Academic Program or Degree

1. Program Name Computer and Information Science 2. Date of Submission _____

3. Title of Degree Bachelor of Arts (B.A.)
(include abbreviation)

* Subject Field
4. Code (Number) 0 7 9 9 (Title) Computer and Information Sciences - other (including systems analysis, software engineering)

5. Dept., School, or College Department of Mathematical Sciences, School of Arts and Sciences,

6. Institution Eastern Connecticut State College 7. Proposed Date of Initiation Upon Approval _____

8. Geographic Location of Program Willimantic, Connecticut

9. Institutional Liaison Person Dr. Thomas A. Porter

10. Title Exec. Officer, Student/Academic Affairs 11. Telephone _____

12. Board of Trustees Staff Person (when Trustees Staff is involved) Dr. Thomas A. Porter, Exec. Officer-Academic/Student Affairs

13. Summary (Describe the proposed academic program or degree. An additional page may be attached if necessary.)

This program is designed to train liberal arts specialists with significant mathematical skills in computer and information science. We view computer science as the study of computer systems from the perspectives of computer architecture, systems software and theoretics. This program includes the study of the organization and administration of information through the design, analysis, representation, and application of algorithms on computers. The curriculum selected provides the essential background while preparing the student to work as an applied mathematician as well as a computer scientist. Since the proposed program includes a balance of mathematics, computer science, and general education it is suitable for any liberally educated student interested in careers in computer and information sciences as well as math.

NOT FILL IN. THESE ITEMS WILL BE COMPLETED BY BHE STAFF FOR ENTRY INTO THE INFORMATIONAL SYSTEM.	Planning Approval Action	Licensure Action
	14. SAAC _____	16. SCA _____
	15. BHE _____	17. SAAC _____
		18. BHE _____

* To be selected from the Taxonomy of Instructional Programs (Provisions: Appendix D)

APPLICATION SUMMARY
(For Planning Approval and Licensure)

CONNECTICUT BOARD OF HIGHER EDUCATION

P.O. BOX 1320, HARTFORD, CONNECTICUT 06101

HL 7 NEW 7 78

DESCRIPTION OF PROPOSED ACADEMIC PROGRAM OR DEGREE

PROGRAM NAME	DATE OF SUBMISSION
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OF DEGREE (and abbreviation)

*SUBJECT FIELD CODE (No.)	TITLE
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DEPARTMENT, SCHOOL, OR COLLEGE

INSTITUTION	PROPOSED DATE OF INITIATION
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GEOGRAPHIC LOCATION OF PROGRAM

INSTITUTIONAL LIAISON PERSON	TITLE	TELEPHONE
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BOARD OF TRUSTEES STAFF PERSON (When Trustees Staff is involved)

SUMMARY (Describe the proposed academic program or degree. An additional sheet may be attached if necessary)

<p>DO NOT FILL IN These items will be completed by the BHE for entry into the Informational System.</p>	<p>PLANNING APPROVAL ACTION</p>	<p>LICENSURE ACTION</p>
	<p>SAAC _____ BHE _____</p>	<p>SCA _____ SAAC _____ BHE _____</p>

*To be selected from the TAXONOMY OF INSTRUCTIONAL PROGRAMS (Provisions: Appendix D)

CONNECTICUT BOARD OF HIGHER EDUCATION

APPLICATION FOR PLANNING APPROVAL: GUIDELINES

Instructions: When preparing an application, repeat as section headings all of the actual items listed in this format prior to listing the responses. Where the applicant does not believe a response is necessary, please provide an explanation. Your prepared application must follow the guideline topics. The completed application should be accompanied by the Application Summary, unless the summary has been previously submitted. Any questions about the application process or completion of any form may be answered by arranging a consultation with the staff of the office of Planning and Academic Affairs. Other information related to the completion and evaluation of the application may be found in the Board document Provisions for the Coordination of Planning and Licensure of New Academic Programs and Degrees dated July 1, 1978.

I. PROGRAM DESCRIPTION

- A. In addition to the Application Summary statement, indicate what are the characteristics and purpose or educational objectives of the program. Identify the area or areas of specialization and subspecialties where appropriate.
- B. Where there may be a question of program articulation with other institutions, as is the case in sending or receiving transfer students, clinical or field work arrangements or preparation for higher studies, please indicate the situation with regard to the proposed program.
- C. Indicate the geographic location(s) where the program will be offered. Provide an explanation if location is other than established campus.
- D. If special program approval is needed for certification or licensure of graduates for employment, identify the situation and intention of the institution toward securing such approval.

II. JUSTIFICATION (Educational Impact)

Supporting information for programs will vary. The applying institution should be able to adapt its questionnaire responses appropriately. If a program may be considered well justified on a basis other than labor market/manpower statistics, other bases should be provided with supporting data and rationale.

The Board also will take into account that there may be a difference in the types of data and justification for different levels of programs including those in two-year colleges.

- A. Relationship to master plan of institution, of its board of trustees, and of the Board of Higher Education should be explained.
- B. Relationship to Other Programs -
 1. Indicate the relationship of the proposed program to other programs and resources in the institution.
 2. Identify any similar existing or proposed academic programs or degrees in Connecticut in public, independent or proprietary institutions. Provide data and commentary to indicate that consideration has been given to the role of other institutions offering similar programs in the geographic area to be served by the proposed program.
- C. Future outlook information (social need, social change) should be provided.
- D. Student demand and citizen interest.
 1. Describe provisions made to identify prospective students.
 2. Estimate student enrollment for each of the first five years (explain and cite sources for estimates).
 3. Cite provisions that have been made for placement and/or student follow-up for this program.
- E. Program/Employment Articulation.
 1. Employment needs data as applicable--local, regional, state and/or national estimate--for the next five years should be provided.

2. Professional and technical advisory groups (as appropriate) which helped develop and will continue to assess the program should be identified and their roles explained.

III. RESOURCE SUPPORT (Fiscal Impact)

- A. Display the proposed budget for first year of operation, including explanation of the following categories. What is currently available? What additional is needed?
 1. Personnel
 2. Library and learning resources
 3. Other facilities and equipment
- B. Estimate income and expenditures for the next four years after program initiation. Identify new costs generated specifically by the new program or degree. Provide a rationale for the estimates.

IV. PROGRAM EVALUATION

Each new academic program and degree will be reviewed at some time after initiation to determine its success in achieving the purposes for which it was established.

A. Performance Criteria

Please indicate criteria which will be used to evaluate program success. Criteria or objectives might include quantitative or subjective information based upon reports of enrollments and degrees conferred, placement of graduates, alumni surveys, or special funding attracted by or through the program.

B. Schedule for Evaluation

An agenda for periodic assessment and evaluation should be provided, briefly indicating when, how, and by whom the performance criteria will be applied to the program. The first review should normally be conducted within two years of program initiation or within three years of degree adoption.

V. EQUAL OPPORTUNITY STATEMENT

The applying institution is required to certify that the program will be operated under the provisions of approved nondiscrimination plans including consideration for women and minorities and accessibility for the handicapped.

VI. TIME SCHEDULE

- A. Provide the date of program plan approval by the board of trustees, or indicate the date of approval and by whom if authorization has been delegated by the board of trustees.
- B. Indicate the proposed date (month) for initiating the program and officially matriculating the first students.
- C. Indicate the target date (month) when the first graduate of the program will be recognized, such as by conferring a degree.

Submit application to: Planning and Academic Affairs
Board of Higher Education
P.O. Box 1320
Hartford, Connecticut 06101

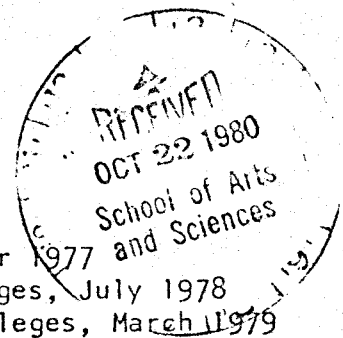
Phone: 566-3910

July 1, 1978

APPLICATION FOR PLANNING APPROVAL

B.A. DEGREE IN COMPUTER AND INFORMATION SCIENCE

Submitted to President, Eastern Connecticut State College, November 1977
Submitted to Planning Committee, Board of Trustees for State Colleges, July 1978
Resubmitted to Planning Committee, Board of Trustees for State Colleges, March 1979



I. PROGRAM DESCRIPTION

- A. This program is designed to train liberal arts specialists with significant mathematical skills in computer and information science. We view computer science as the study of computer systems from the perspectives of computer architecture, systems software and theoretics. This program includes the study of the organization and administration of information through the design, analysis, representation, and application of algorithms on computers. The curriculum selected provides the essential background while preparing the student to work as an applied mathematician as well as a computer scientist. Since the proposed program includes a balance of mathematics, computer science, and general education it is suitable for any liberally educated student interested in careers in computer and information sciences as well as math.
- B. Special courses in electrical engineering are available at the University of Connecticut in Storrs for those students desiring specialization in hardware aspects of the subject.
- C. Geographic location: ECSC campus.
- D. No special certification or licensure involved.

II. PROGRAM JUSTIFICATION (Educational Impact)

- A. This program is in accord with the mission of Eastern Connecticut State College and the mission of the Board of Trustees for State Colleges of Connecticut. The academic master plan for Eastern Connecticut State College includes this program as a proposed new

offering in the 1979-80 timetable, with two additional positions proposed by 1982. This combined academic and occupational program is also in keeping with the Board of Higher Education's stance on educational planning challenges viewed as opportunities to provide improved educational offerings within a dynamic and responsive system of higher education for the State of Connecticut.

B. Relationship to other programs.

1. The Liberal Arts major in Computer and Information Science is well suited to the qualifications of our present faculty. The program, similar to one recommended in the March, 1975 issue of the American Math Monthly of the Math. Association of America, carries a heavy mathematics emphasis. The calculus and differential equations courses are taught by all the members of the department. The two advanced math courses required in the new program, Set Theory (Math 230) and Real Analysis I (Math 420), can be taught by any one of the staff, though they are usually handled by Harkness and Kenton, the staff members who are chiefly concerned with theoretical mathematics. The introductory programming language courses in Fortran (CIS 110) and Cobol (CIS 115) can be taught by Carter, Geissert, Duchow, Sharlow, and Ferbrache, though the latter three usually handle this. The advanced computer and information science courses are taught by Ferbrache with Carter and Geissert handling Numerical Analysis and Operations Research. Professor Sharlow, with support from a Board of Trustees Retraining Grant, is pursuing advanced studies in Computer Science at the University of Connecticut and will soon be expected to teach certain advanced courses.

The resources of the Department of Mathematical Sciences are well suited to this program: all courses within the new major are now scheduled at least once every two years on a regular basis; our equipment is more than sufficient to meet future demand.

(see III. A. 3.)

2. Similar academic programs in Connecticut. (as of date of first submission 1977-78)

Of the State Colleges, only Central has a major in Computer Science, while Southern and Western have concentrations in the area.

Central has about seventy-five students, while Southern and Western have about thirty each. In Connecticut, Yale, the University of Connecticut and the Hartford Graduate Center (R.P.I.)

have major programs; Yale has a major in mathematics/computer science and a major in computer science with a combined enrollment of about thirty-five students; the University of Connecticut has about sixty advanced students and R.P.I. has about 220 students (mostly part-time) enrolled in its Master's program. Several other colleges in Connecticut have concentrations in computer science: the Coast Guard Academy (20 students), the University of New Haven (35 students), Wesleyan University (25 students), Trinity College and the University of Bridgeport.

- C. Future outlook (social need, social change).

There is little doubt that a technological age requires citizens who will bring to their society humanistic values as well as technological expertise. The proposed program will provide access to both, and will ensure delivery within the state system of post-secondary education of modern concepts and skills in math and computer sciences together with traditional values and learning. Nationally, computer science is one of the fastest-growing professional careers.

Within the state, numerous opportunities for employment are available in a wide variety of public and private settings. Most certainly computer technology will, in the future, inform and assist every field of human endeavor. In order to avoid the danger voiced in New England more than a century ago by Ralph Waldo Emerson, "Things are in the saddle and they are riding mankind," the proposed program would aim to prepare state college graduates with the technical skills, humanistic values, and social awareness needed to provide human and ethical controls for man's technology, together with the communicational skills needed to articulate its values and shape its future. The program will be accessible to the same student population which now manifests an aptitude for an interest in mathematics and computer science and will provide a rigorous discipline suited to the needs and abilities of the state college student without being, in any sense, an "elitist" program. In an age of overabundant information, graduates of this proposed new program will be better able cognitively and practically to process information and to perform other essential processes with understandings and skills acquired in working toward the bachelor's degree in Computer and Information Science. (3% of student S.A.T. Math scores for Eastern's 1979 freshman class were 600 or over, only slightly lower than the national norm (4%), and 15% scored 500 or over in 1979, (national norm 15%).)

D. Student demand and citizen interest.

1. Provisions made to identify prospective students. The College's Office of Admissions and Records reports from staff experience in visits to high schools and interviews a great interest among prospective college students concerning the computer sciences as their intended area of study. Most of these students do not now

come to Eastern. Of students who actually do list Eastern as one of the colleges of their choice, a recent report by the Admissions Testing Board of the College Board, (January 1979 "A.T.P. Summary Highlights of the 1977 and 1978 Freshman Class, Eastern Connecticut State College") shows that a higher percentage than the national norm listed computer science as their intended area of study at Eastern: 2% of students tested nationally in 1977 and 1978 listed computer science as their intended major; of the students whose scores were sent to Eastern in 1977, 2% chose computer science; in 1978 that number had risen to 3% and 3% again in 1979, with a corresponding increase in student numbers. Of the current math majors now in their senior year, 50% have indicated they would have been interested in a Computer and Information Science major if such a program had been available. Among freshmen, the percentage is even higher. In a September 1980 survey of freshmen and sophomores enrolled in calculus and pre-calculus, 45 indicated they would seriously consider our computer science major if it were offered. Academic advisement shows that some students who have left Eastern after freshman or sophomore year did so to take advantage of computer science programs elsewhere. A few have changed majors within the institution. The Office of Academic Advisement records for July 1978 show 62 students with a declared major in Mathematics, with an additional 27 in Mathematics-Data Processing, and 3 more with a concentration in Mathematics-Secondary Education. The current ECSC catalog lists a minor in Computer Information Science that serves mathematics majors, liberal arts non-math majors, with a separate Business Track for students in Business/Economics. These tracks are also helpful in identifying prospective students.

2. Estimated student enrollment.

<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>	<u>1985-86</u>
50	65	90	100	110

1981-82 estimates are predicated on incoming freshmen preferences and the large number of current freshmen who will transfer to the program as sophomores. We conservatively estimate 40 students entering the program by its fourth year of operation; it is likely this numbering may be doubled. As shown in II B. 1, present staffing can accommodate the initial stages of the program.

3. Placement and/or student follow-up.

Since completion of internal planning for this program (Nov. 1977) the chairman of the Department of Mathematical Sciences has been actively engaged in exploring with area business and corporate leaders the possibility of internships and employment opportunities for students in this program. The Dean of Arts and Sciences has also contacted John Marsh, Technical Director of the new I.T.T. Communications Center in Shelton, in response to an August 1978 item in the Hartford Courant and Willimantic Chronicle citing Director Marsh's difficulty finding 75 communications engineers, computer scientists and programmers to staff the new facility. I.T.T. has expressed an interest in the proposed program and their Lab Director and Director of Software Technology have agreed to meet with department staff to arrange for student interns and to advise concerning the program itself. In addition, Michel Guilloud, Director of the Schlumberger-Doll Research Center in Ridgefield, has informed the Dean of Arts and Sciences of SDRC's interest in hiring qualified liberal arts

graduates from the program and in placing student interns; there is also a possibility of scholarships available from the Schlumberger Foundation (which stipulates the CIS major must be accompanied by a minor in English or Communications, particularly writing) and from other corporations contacted by the department chairman.

The Director of Career Planning and Placement would be directly involved with the department and staff in assisting students by means of placement and follow-up procedures now in effect for existing programs at Eastern. The department already has a very active internship program for college or industrial experience in computer science or operations research making further placements in internship situations no problem. As is done now, the student will gain experience in using skills learned during the first three years of study. Supervision will be provided by both the employer and the internship coordinator.

The Director of Career Planning and Placement (ECSC) is of the opinion that this is a very marketable program; the Director of Admissions and Records (ECSC) believes it will be an effective response to prospective student needs and will prove useful in recruitment. Open hearings held by the Five Year Academic Master Plan Committee during the fall 1978 semester reveal general faculty support for the proposed program.

A 1980 survey of all math alumni shows a majority in computer related areas. These alumni agree that there will be increasing need for individuals with the training our new program will offer. Of special note is their encouraging us to continue the training of scientists with general skills in both mathematics and computer science.

E. Program/Employment Articulation

1. The proposed new program in Computer Information Sciences combines two features in demand today by prospective employers: a strong foundation in general education, including improved communications skills, values clarification, and cognitive skills, together with structured development of mathematical skills in computer and information sciences. Following the lead of personnel management who urge greater diversification among liberal arts graduates and the acquisition of marketable skills, students following this proposed curriculum will be prepared to work as applied mathematicians and/or computer scientists and will be prepared as educated persons to cope with and participate in the technological world of work and leisure. Since computer and information sciences comprise a rapidly growing field that will continue to expand, graduates having the flexibility produced by the strong mathematical background and computer skills integral to this program can be expected, in the foreseeable future, to find ready employment in both public and private sectors. Of the many corporate interviews arranged by the Director of Career Planning and Placement on campus since January 1978 (three of these specifically for majors in the Department of Mathematical Sciences), the majority of personnel management emphasize the need for strong background in computer science, with fluency in Fortran and Cobol particularly necessary; however, it was also indicated that management requires flexibility among graduates in the acquisition of on-site skills through follow-up training provided by each company. For this reason, and reasons cited above, the inclusion in this program of systems analysis (user designed programs) real analysis and computer

architecture should greatly enhance the marketability of skills acquired by students in the program and yet remain within the range of mathematical abilities of the state college undergraduate student as manifest in current enrollments. A Pratt and Whitney consultant particularly recommended the Real Analysis course.

2. Professional and technical advisory groups as appropriate.

Using as basic models the approaches suggested in the official journal of the Mathematics Association of America (American Mathematical Monthly, March 1975) and the Dartmouth College "computer literacy" programs, the proposed program in Computer and Information Science was formulated with the assistance of internal staff, members of the ECSC Department of Mathematical Sciences, in consultation with the University of Connecticut Computer Center, which assisted also in preparation of hardware proposals for equipment best suited to their IBM 360/70. The chairman of the Department of Mathematical Sciences has also consulted with members of the University of Connecticut Department of Mathematics and computer staff in preparation of this program, the Department of Applied Mathematics at Central Connecticut State College, Professor David Meeker of the University of New Hampshire and Mr. John Vose, Vice-President of American Thread Company in Willimantic, Connecticut.

Consultant

III. Resource Support (Fiscal Impact)

A. Proposed budget for the first year of operation.

1. Personnel--part time staff only. With the addition of David Ferbrache to the staff in 1978 the existing staff is qualified to initiate the program. At present, the two advanced math courses

required in the new program can be handled by regular mathematics staff. Two introductory level and two existing and five new advanced courses in Computer and Information Science can be staffed by four qualified members of the department, including Professor Paul Duchow (who was on leave 1978-79 to pursue further studies in Computer Science at California Polytechnic State University) and Dr. John Sharlow who is pursuing advanced studies in Computer Science at the University of Connecticut under a Board of Trustees Retraining Grant. Several math courses that will be required for the computer and information Science Program are not now filled to their maximum allowable enrollment (M150, 151, 160, 161, 263, 300, 420, 350, 360). It is thus possible to accommodate some students now without an increase in faculty.

2. Library and learning resources. Since inception of the planning stages for the proposed new program, the Department of Mathematical Sciences has been purchasing library materials to augment the mathematics collection of materials in statistics, operations research, numerical analysis, probability, and real analysis. Additional technical materials in machine language, logical design, switching theory, and electronic data processing are purchaseable within the department's normal budget for the three-year projection of library acquisitions for the program. Books and library materials for specifically computer and information science were purchased in the amount of \$1,085 for the last academic year.
3. Other facilities and equipment. With the award of a Board of Trustees grant in 1979, and the recent (Sept. 1980) \$20,000 award from the National Science Foundation, our equipment needs will be completely met during the first year of program operation

without need of additional funding. In this first year, other expenses (CPU time on the University of Connecticut IBM 370 computer being the largest) should not exceed that allotted for the current budget for advanced CIS courses. A possible additional expense, depending on the disposition of the College's update of its computer is an additional CPU expense for use of the DEC 11/70 at Central Connecticut State College.

B. Estimated income/expenditures four years after initiation.

Income accruing from full-time student enrollments:

	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>
Majors	50	65	90	100

At present time, joint consideration is being given to combined operations for administrative and academic computer use. The Department of Mathematical Sciences is spending \$22,500 in the 1980-81 academic year, awarded to it by the Board of Trustees, for the purchase of computer terminals and other peripheral equipment. A further award of \$20,000 from the National Science Foundation for computer equipment was announced in September, 1980. In this expanding area of technology, the grant-writing team in the Department of Mathematical Sciences is optimistic about future outside grants-in-aid from corporate and government sources.

The principal item of additional expense will be CPU (central processing unit) time at the University of Connecticut for Assembly Language, Fortran, and Numerical Analysis Courses (about \$2000/yr. by the fifth year of operation), though this cost would be more than halved if the new college computer has a Fortran compiler. In addition, a program expanding according to our estimates will require a new full-time staff person no later than the third year of operation (perhaps

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Faculty
1980-81?

sooner, as increasing demand for low level computer courses from students in other majors drains faculty resources from the more advanced courses). Continued hardware additions are not anticipated for this liberal arts program.

IV. Program Evaluation

A. Performance Criteria

1. Reports of enrollment and degrees conferred.
2. Placement of graduates.
3. Alumni surveys.
4. Grants-in-aid and scholarships.
5. Interest surveys of related industries and evaluation of student interns and/or graduates employed.

B. Schedule for Evaluation:

1. October 1980: New England Association of Schools and Colleges, re-accreditation visit by team, preceded by year-long institutional self-study to examine solidity, integration, and viability of academic programs overall. (Team members will examine the new program, with possible provision for consultants in mathematics and computer science.)

In the regular course of admission to junior standing (1980 and every year thereafter), student evaluations of the program will be sought and its efficacy re-examined in the light of student progress and faculty evaluation of the program components.

2. June 1982: First-year progress report to Board of Trustees and Board of Higher Education.

Handwritten note:
1980
1981
1982
1983

V. Equal Opportunity Statement.

This program will be operated under the provisions of approved non-discrimination plans as described in the 1978-79 undergraduate catalog of Eastern Connecticut State College (p.18), which states that no applicant will be rejected "because of sex, race, color, religion, national origin, or handicap," and in the Eastern Connecticut State College Affirmative Action Plan updated and filed with the Commission on Human Rights and Opportunities, March 5, 1979 which states, in part, "It is the policy of Eastern Connecticut State College to provide equal opportunity in all phases of employment based on qualification and competence without discrimination because of racial origin, color, religious belief or association, sex, age, national origin, physical disability (including, but not limited to blindness), criminal record, mental disorder, and marital status."

VI. Time Schedule

- A. 1. Institutional approval: February 1, 1978.
2. Program plan approval by the Board of Trustees for State Colleges: June 8, 1979.
- B. Proposed date for initiating program: September, 1981.
- C. Target date for conferring of first degree: June, 1982.

(Three students currently in their junior year are taking the full complement of math and computer science courses; they may have sufficient credits for a double major.)

COMPUTER AND INFORMATION SCIENCE MAJOR

General degree requirements will conform to the basic requirements of Eastern Connecticut State College's Four-Year Curricula; a minimum of 120 semester hours required for the degree, and the general distribution requirements as listed below:

<u>General Distribution Requirements*</u>	<u>Semester Hours</u>
1. General Education Core	36
2. Health and Physical Education	3
3. Electives	37
4. Introductory Courses for Majors:	
a. Introductory Mathematics	16
b. Introductory Computer and Information Science	<u>3</u>
5. Advanced Courses for Majors	95
a. Advanced Mathematics	7
b. Advanced Computer & Information Science	<u>18</u>
	<u>120</u>

* In addition to the General Distribution Requirements, the student must take seven credits in advanced mathematics and 18 credits in advanced computer and information science.

Computer and Information Science Requirements1. Introductory Mathematics

<u>Course</u>	<u>Title</u>	<u>Sem. Hrs.</u>
Math 150, 151 or Math 160, 161	Calculus and Analytic Geometry	8
Math 170	Linear Algebra	2
Math 260	Infinite Series and Differential Equations	4
Math 261	Vector Calculus	$\frac{2}{16}$

2. Introductory Computer and Information Science

CIS 110	Fortran	3
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3. Advanced Mathematics

Math 230	Set Theory	3
Math 420	Real Analysis I	$\frac{4}{7}$

4. Advanced Computer and Information Science

CIS 230	Assembly Language Programming	3
CIS 320	Programming Methodology	3
CIS 330	Data Structures	3
CIS 350	Numerical Analysis	3
CIS 370	Systems Programming	3
CIS 380	Computer Architecture	$\frac{3}{18}$

Description of Computer and Information Science Courses

All courses: 3 semester hours, 3 credits.

CIS 100: Computer Concepts

Introduction to computer applications in all fields, development of the five components of a computer system, binary and hexadecimal number systems, logic, flowcharting, programming in BASIC.

CIS 110: Computer Programming - Fortran

An introductory course in computer programming using the Fortran language. Students will flowchart, write, and debug their programs. Application will be from many fields.

CIS 115: Computer Programming - Cobol

A beginning course in computer programming using the COBOL language. Flowcharting, writing programs, keypunching and running the programs on the college's computer, and debugging them. A minimum of six programs will be required. Applications will be chiefly in the area of business and data processing.

CIS 116: Advanced Cobol

Sequential file processing, sequential file updating and table handling, using disk and tape storage.

CIS 230: Assembly Language Programming

Computer organization and data representation; programming in machine language and assembly language; subroutines, macros; description of an assembler.

CIS 320: Programming Methodology

Programming as a systematic activity. Procedures for the production of readable, reliable, modifiable programs. Problem analysis, modular design, testing, and documentation; programming assignments.

CIS 330: Data Structures

Implementation and manipulation of arrays, stacks, queues, lists, trees, and graphs; programming exercises.

CIS 350: Numerical Analysis

Computer solution of problems of interpolation, approximation, numerical integration, polynomial and differential equations and systems of linear equations.

CIS 370: Systems Programming

Introduction to systems programming concepts; assemblers, loaders, compilers, and operating systems; programming exercises.

CIS 380: Computer Architecture

Basic hardware components, register operation, central processor organization, microprogramming, I/O organization.

CIS 401: Topics in Computer Science

CIS 480: Independent Study

Prerequisite: Consent of instructor.

CIS 490: Computer Internship

Prerequisite: Thorough knowledge of at least one programming language and permission of department.

On the job training. The student will work 16 to 20 hours per week for one semester or one summer, in the computer section of some private industry.

Proposed Schedule of Course Offerings

All advanced Computer and Information Science courses will be offered in a 2-year cycle as shown below. The cycle began in Fall, 1980 with the current offering of CIS 230.

Every Year

CIS 230 (Fall)

CIS 320 (Spring)



STATE OF CONNECTICUT

EASTERN CONNECTICUT STATE COLLEGE

WILLIMANTIC, CONNECTICUT 06226

November 21, 1980



RECEIVED

NOV 24 1980

BOARD OF TRUSTEES
FOR THE STATE COLLEGES

TELEPHONE
456-2231
AREA CODE 203

Dr. Thomas Porter
Executive Officer for Academic Affairs
Board of Trustees for State Colleges
P. O. Box 2008
New Britain, Connecticut 06050

Dear Dr. Porter:

Enclosed is the updated Computer and Information Science Program proposal. Since all the courses included in this proposal are currently being offered, we would be in a position to implement the program upon approval. For these same reasons I hope that it can go forward very quickly so that we would in fact be able to implement it during the second semester of this academic year.

If there are any questions about it please call.

Sincerely yours,

Delbert E. Meyer
Vice President for Academic
Affairs

DEM:dcb

*Fiscal Impact Statement
"Liberal arts specialists" ✓
March 25 issue of Monthly
Comm. March Monthly
Wrong - Sachson has money - see p. 3.
Other programs.
Where does computer architecture fit in?
Report on the 1/2 of 1% grant?*