

SILICON FRASER UNIVERSITY

S.73-63

As revised and approved by  
Senate, May 7, 1973

MEMORANDUM

SENATE

From ACADEMIC PLANNING COMMITTEE

Subject

COMPUTING SCIENCE PROGRAM

Date APRIL 18, 1973

MOTION: "That Senate approve, as set forth in S.73-63,  
the Undergraduate Computing Science major,  
honors and minor degree programs and courses."

If the above motion is approved,

MOTION: "That Senate waive the normal two semester  
time lag requirement in order that the  
Undergraduate Computing Science major, honors  
and minor degree programs and courses may be  
first offered in the Fall semester 73-3."

# SIMON FRASER UNIVERSITY

S.73-63

## MEMORANDUM

Dr. K. Strand

From... Academic Planning Committee

President

Subject... Computing Science

Date... April 18, 1973

The attached paper contains the recommendation of the Academic Planning Committee concerning the Computing Science Program proposal.



I. Mugridge

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## RECOMMENDATION.

That Senate approve the Undergraduate Computing Science major, honors and minor degree programs and courses as contained in Senate Document S73-63.

### Background Information

On December 7, 1970 Senate approved motions contained in paper S.437 calling for the establishment of a Computing Science program within the Division of General Studies.

The initial charge to the Dean was that a Coordinator/Director be appointed to oversee the development of the Program and that a Steering Committee be formed from within the University to ensure representation from those Faculties whose students would require access to the Program. In the Fall of 1971 a search committee was formed and Dr. Sterling was appointed as Director, effective 1st May, 1972.

In May 1972 Dr. Sterling presented a paper to the Academic Planning Committee entitled "Tentative Recommendations for a New Model Computer Science Curriculum" which laid down the general model under which he foresaw the eventual development of the Computing Science Program. The Academic Planning Committee reviewed this paper and approved it in principle.

In the Summer of 1972 the Steering Committee was formed and the detailed development of the proposal was undertaken. The Committee included representatives from all four Faculties and the Computing Centre (for membership see preface to the proposal).

During the Fall Semester 1972, the Committee forwarded copies of the proposal to all Departments in the University for comment; and a series of meetings was arranged between Dr. Sterling and interested departmental and Faculty Undergraduate Curriculum Committees.

In December 1972, the proposal was unanimously endorsed by the Steering Committee and was forwarded to the Academic Planning Committee.

In February, 1973 the Academic Planning Committee referred the proposals to SCUS for an evaluation of its various programs and courses. SCUS unanimously endorsed the proposal as a whole, but spoke against the recommendation of the Steering Committee that ten courses (Compt. 124, 290, 291, Math 306, Compt. 351, 390 and Math 401, 402, 403 and 406 in the present proposal) be cross-listed with other departments. This position was not meant to impugn the courses in question, but was the result of a motion which established a general policy against the cross-listing of courses within the University. (see attached recommendations from SCUS).

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The Academic Planning Committee later endorsed the SCUS action concerning cross-listing and referred the proposal back to SCUS for the appropriate designation of the ten courses.

SCUS recommended that five courses, namely Compt. 124-3, 290-3, 291-3, 390-3 and 351-3 are to be listed as Computing Science courses and that five courses, Math 306-3, 401-3, 402-3, 403-3 and 406-3 are to be listed as Mathematics courses but are to be used as required courses where appropriate within the Computing Science Program.

The document presented to Senate has been amended to reflect these course designations.

Note: The courses to be listed as Mathematics courses are included here for program information only. They will be developed and forwarded to Senate for approval after review by the Faculty of Science and the Senate Committee on Undergraduate Studies.

# SIMON FRASER UNIVERSITY

## MEMORANDUM

Members of Senate

From I. Mugridge

Chairman, Senate Committee on Undergraduate  
Studies

Subject Computing Science Program

Date April 18, 1973

The following memorandum is a summary of the actions taken by the Senate Committee on Undergraduate Studies in considering the Computing Science Proposal.

Initial consideration of this proposal was undertaken following referral from the Academic Planning Committee for an examination of the courses and the program. The result of this consideration was that the Committee sent the proposal back to the Academic Planning Committee with its unanimous recommendation that the program be approved. Doing this, however, the Committee raised the question of cross-listing of courses for which no rules existed in the University. SCUS indicated its intention to discuss this question and to forward a recommendation on it to Senate for its consideration. In the meantime, however, the Computing Science Proposal was referred back to the Academic Planning Committee in order to expedite its consideration so that it may be operational for the Fall semester. It should be noted that, by this action, SCUS did not intend to indicate its disapproval of any of the courses or any part of the program proposed by the Computing Science Steering Committee.

In the interval between the consideration of the Computing Science Program by SCUS and its subsequent discussion by the Academic Planning Committee, the question of cross-listing of courses had been discussed by the former committee with the result that the motion on that subject now before Senate was passed. This motion was brought to the attention of the Academic Planning Committee during the discussion of the Computing Science proposal and was endorsed by the Academic Planning Committee. Following approval of the Computing Science proposal, the Academic Planning Committee referred back the question of the listing of courses which had been proposed for cross-listing to SCUS.

At its meeting of 17th April, 1973, the Committee discussed the courses in question. These are as follows:

1. Computing Science 290, Computing Science 291, and Computing Science 390 which were to have been cross-listed with Kinesiology;
2. Computing Science 351 which was to have been cross-listed with Geography;

3. Computing Science 124, Computing Science 320, Computing Science 421, Computing Science 422, Computing Science 423 and Computing Science 426 which were to have been cross-listed with the Mathematics Department.

In the case of the courses listed under 1 and 2, agreement had been reached with the departments concerned that these courses should be listed under Computing Science with the numbers noted. The faculty and resources necessary to mount the courses will be shared between the departments concerned and there is no overlap of subject matter with any courses currently offered within either the Kinesiology or the Geography Department. It was also brought to the notice of the Committee that, in the case of courses, Computing Science 290, 291 and 390, some question had been raised concerning the appropriateness of offering these courses within the Physics Department. Inasmuch as there seemed to be no overlap of subject matter with courses currently offered by Physics, ~~and~~ <sup>and</sup> requirement in the course proposals to use laboratory or other resources currently possessed by the Physics Department, ~~and it is proposed that a member of the Kinesiology Department should teach these courses and the~~ courses are specifically designed to service the Computing Science Program, it was thought that the courses should be offered as designated above.

In the case of the courses noted under 3 above, agreement had been reached by the departments concerned that Computing Science 320 will be offered as Mathematics 306, Computing Science 321 will be offered as Mathematics 401, Computing Science 422 will be offered as Mathematics 402, Computing Science 423 will be offered as Mathematics 403, Computing Science 426 will be offered as Mathematics 406. Offering of these courses will be cooperative in the manner indicated above. The Committee also accepted this recommendation.

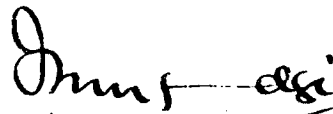
In one case, that of Computing Science 124, agreement had not been reached. Computing Science 124 is a new course entitled Elementary Computational Methods and is one in Arithmetic for Computing Science students. It was the understanding of the Committee that such a course would not normally be part of a Mathematics curriculum and that it had not been offered as such by the Mathematics Department at Simon Fraser, since the purpose for which it was now being proposed, the servicing of Computing Science students, had not hitherto been a relevant one. The course proposal states specifically that the course will be taught by members of the Mathematics Department. There is no overlap with any course currently offered by the Mathematics Department, although some of the material covered by this course had been included in Mathematics 205, which had earlier been dropped by the Mathematics Department with the advent of the Computing Science Program. In the light of these considerations, it was felt that Computing Science 124 should remain listed within that program.

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The recommendations of SCUS on the listing of courses is therefore as follows:

1. that Computing Science 124, Computing Science 290, Computing Science 291, Computing Science 390 and Computing Science 351 should continue to be listed as Computing Science courses as laid out in the Steering Committee's proposal; and
2. that Computing Science 320 should become Mathematics 306, Computing Science 421 should become Mathematics 401, Computing Science 422 should become Mathematics 402, Computing Science 423 should become Mathematics 403, and Computing Science 426 would become Mathematics 406.

These courses would come forward through the Mathematics Department and the Faculty of Science in the usual way.



I. Mugridge

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THE UNDERGRADUATE COMPUTING SCIENCE PROGRAMME

at

SIMON FRASER UNIVERSITY



The proposed programme in Computing Science attempts to resolve the difficult obstacles to integrating new scientific advances and ideas with implications for many disciplines into the traditional structure of a university education. Not all the implications of the proposal are discussed here. Many problems created by our approach may have to be resolved as the programme is implemented. But, despite the obvious difficulties of attempting to innovate rather than to adopt a more traditional format, we feel that the development of a universal course sequence has peculiar advantages for Simon Fraser and possibly carries with it the intellectual excitement that is of benefit to the life of a university.

One set of problems needs special mention, however, These are the very practical problems connected with the listing of courses. For purposes of this proposal, we treat all courses in the programme as Computing Science courses although eventually many may be offered through other departments. These courses have been carefully worked out by the Steering Committee, often in consultation with members of departments that are likely to be affected and with the understanding that they will be offered by Faculty on Joint Appointments and listed as Computing Science requirements as well as offerings by other departments.

The programme was generated with the help of many individuals. Extensive discussions were held between members of the Steering Committee and the Faculty, leading to a better definition of the Computing Science Programme and of its place in the University. Extremely valuable too was the discussion with leaders of student unions of a number of departments and with other interested students who proposed useful ideas for furthering the aims of the programme. Final credit and responsibility for ensuring that the programme conforms with the wishes of the Faculties and of the Senate and satisfies the needs of students rests with the members of the Steering Committee.

T. D. Sterling

Members of the Steering Committee

Egan, K.	Education
Gay, I. D.	Chemistry
Harrop, R.	Mathematics
Jewell, R.	Computing Centre
Koopman, R.	Psychology
Lardner, R.	Mathematics
Sterling, T.	Computing Science
Vergin, R.	Economics & Commerce

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## Rationale

Two major guidelines determined the form of this proposal.

1. Any Computer Science Programme faces severe difficulties in devising a curriculum that will satisfactorily meet the educational aims and add to the academic life of the University community.
  - a. Wide-ranging demands are made on a computer science curriculum. There is the increasing computerization of biological, management, and social sciences. The humanities have been drawn into uses of computers mainly through numerical taxonomy, graphics, and text processing. Engineering and the physical sciences use computers as major computational tools. Then, there are a large number of students who expect to earn a living by working in industry as programming technicians, analysts, or software engineers. Finally, there are students who wish to take up Computing Science as an academic or professional career.
  - b. Students come to the programme with a wide variety of backgrounds. In some instances, students have had introductory courses in high school or even have worked as programmers before coming to the University (and some of them do so while going to school), while others have no background in computing. Some students have a thorough background in numerical methods

and/or statistics, others may be seriously deficient in these topics, with no intention of undertaking additional studies in these fields.

- c. There is no traditional sequence of courses that make up a Computing Science curriculum. Curriculum 68, (suggested by the Association for Computing Machines in 1968) has by and large, served its purpose. There is a great deal of confusion as to what ought to supersede it.
- d. Just as any other area, Computing Science must strive for an economy of intellectual content and an economy in the use of staff.

- 2. The proposed programme has to fit into the evolving structure of the University and take cognizance of the practical needs of all involved and potentially involved departments and existing programmes.

Since Simon Fraser does not have a long or firm tradition in its organization or in teaching Computing Science, the decision was made to design and implement an innovative programme in Computing Science that offers at the same time a valuable service to many departments and contributes to the breadth of scholarship that epitomizes the idea of the university.

The approach adopted is a Universal, Single Track Programme in which teaching and research in applied computing, carried on by qualified faculties from "user" departments, is co-ordinated and integrated in a strong core programme

## The Basic Strategy for the Computing Science Programme

It is proposed to develop a programme in basic and applied computing, taught by:

- I. qualified faculty members from a number of departments in the university who are qualified to teach selected topics in Computing Science;
- II. a Computing Science faculty, whose core programme supports, and is co-ordinated and integrated with I.

The results are a sequence of courses that pivot around a single track which all students in the university may enter and leave at different levels, depending on their educational aims and needs. The following guidelines will be followed:

1. Teaching will be done by:
  - (a) computing scientists with full-time commitment to the programme;
  - (b) faculty in other divisions of the university who have a joint appointment in Computing Science and another department. They will be qualified by their background, experience, and interest to teach courses (at all or some levels) in Computing Science;
  - (c) faculty in other divisions of the university who take responsibility for special courses in the Computing Science Programme - they may or may not need to rely for additional support on

Computing Science staff

- (d) staff members for the University Computing Facility who will teach (or participate in courses) as can be arranged
  - (e) others on special arrangements
2. The curriculum will be constructed of progressively advanced levels each consisting of:
- (a) one or two core courses in basic Computing Science topics that will prepare students for a number of applications courses, and
  - (b) a number of "technique" courses that deal with specific applied problem areas
3. The design of the entire undergraduate curriculum in Computing Science will be the responsibility of all the Computing Science faculty (as defined in 1(a) and 1(b) before).
- (a) overlap among applied courses will be avoided.  
(for example, if a member of a particular department offers the course in "Graphics", this will be the only course offered on this topic)
  - (b) each proposed course will have to be approved by the faculty of the Computing Science Programme (full-time and joint appointments)
  - (c) the syllabus for each approved course will specify the concepts to be taught and level of sophistication to be achieved. (The actual design of the course or choice of text will be up to the instructor)
  - (d) since it is not unlikely that some applied courses may require

highly technical input, some courses may be taught as joint ventures between a number of faculty members.

4. The full-time Computing Science faculty will carry major responsibility for teaching the core sequence and assist with applied courses as needed.
5. All faculty in the Programme will advise on all new appointments.
6. The Computing Science Programme will offer the student the opportunity to concentrate either in a "scientific", a "business", or a "humanistic" direction. A major and an honors degree will be offered as a B.Sc. or a B.A. depending on the direction of the student's work.
7. Programmes for students who major in another field but who want to minor in Computing Science (see below) will be designed from available course offerings and will take cognizance of individual student needs.
8. A year work-study programme will be incorporated in the programme as soon as possible for senior Computing Science majors and for selected students who obtain a minor (or its equivalent) in Computing Science.
9. While no graduate programme is presently proposed, programmes will be worked out for graduate students in the Arts and Sciences who want to acquire a Computing Science background.
10. The Computing Science Steering Committee, appointed by the Dean of the Faculty of Interdisciplinary Studies, will have the final say in all policy matters that may arise in implementing the programme.

## PROGRAMMES

### Programme for Majors and Honors in Computing Science

The programme for majors in Computing Science is organized so that students may take advantage of a number of options:

1. he may continue graduate work leading to a higher degree in Computing Science
2. he may continue graduate work leading to a higher degree (not in Computing Science) in an Applied or Theoretical Science or Art
3. he may seek employment

Generally, the highest demand for all graduates (B. A. or B.Sc.) is for Applied Business Programmers (80% of those employed in and around computers work on business applications) and a substantial demand is for the scientific programmers. Although there is a considerable demand for systems programmers within computing facilities and installations, jobs in such installations usually require additional experience in some applied programming pursuit.)

It may be expected also that students with an undergraduate degree wishing to obtain a higher degree in an area other than Computing Science predominately will be students in a business or economics field and only to a lesser extent come from a Science or from Mathematics. The Simon Fraser Curriculum has the flexibility to permit students to prepare themselves for all options listed above. (For content of courses refer to the next section,



DESCRIPTION OF COURSES, page 19).

For students who wish to gain practical experience in working on information problems in Science or Business, a year of practical work under supervision will be available (Computing Science 417).

Entering students may request to take a placement examination which will allow them to identify their point of entry into the program. Students will be allowed to enter the programme at the level at which their operating knowledge is adequate to fulfill most prerequisites.

#### Lower Division Course Requirements

Students who plan to major or take honors in Computing Science normally should obtain credit for the following lower division courses in the first four levels.

1. Computing Science 100-3, Computing Science 102-2.
2. Three credits in Computing Projects in the Arts and Sciences.
3. Computing Science 201-4.
4. Computing Science 260-3.

The following is the recommended sequence of lower division courses for students with regular entry:

1st Semester - Computing Science 100-3, and Computing Science 102-2.

2nd Semester - Three credits in Computing Projects in the Arts and Sciences

3rd and 4th Semester - At least Computing Science 201-4 and  
Computing Science 260-3.

Students are advised to take not more than one Computing Science course in each of the first two levels. (For students with no previous programming experience, Computing Science 100-3 and 102-2 should be considered as a single course.) They will profit greatly if they select a wide range of outside course work in the Arts and Sciences. In selecting courses during the first four levels, the student should keep in mind that Information Sciences draw heavily on all resources of knowledge a university education provides. The student also ought to keep in mind that many courses in Computing Science assume a background of education or skill in diverse areas. In selecting his programme, the student might be guided by the following remarks:

- (a) Computing Science is concerned with man-machine communication. Communication 200-3 or Linguistics 221-3.
- (b) Computerization of social processes tend to fix and perpetuate dehumanizing practices. Computing Science is concerned with developing humanizing procedures.  
Philosophy 103-3, Psychology 106-3, and courses that foster insight into social processes in a modern society.
- (c) Mathematics requirements for students aiming toward scientific applications probably are determined more by their scientific interest than by the needs of Computing Science. The minimal mathematics prerequisite for students

aiming toward graduate work in Computing Science or toward a career in business applications are Mathematics 101-3, Mathematics 151-3 and Mathematics 232-3.

(d) Computer applications are flourishing in the life and demographic areas especially in relation to community health and study and control of the environment.

Geography 001-3.

(e) Some understanding is required of the physical principles underlying the computing hardware and instruments controlled by it.

(CMPT. 290-3 may help students who wish to acquire some knowledge about the basic electronics involved.)

#### Upper Division Course Requirements

Major and honor students are required to consult the undergraduate advisor before making up a programme of study.

#### For Programme - Majors in Computing Science

	Semester Hours
(a) Five courses from Group A	(15)
(b) One course from Group B	(3)
(c) Two courses from Group C	(6 or 7)
(d) Two courses from Group D	(6)
	<hr/>
	30 or 31

For Honors programme in Computing Science

	Semester Hours
(a) Five courses from Group A	(17)
(b) Two courses from Group B	(6)
(c) Four courses from Group C	(12 or 13)
(d) Five courses from Group D	<u>(15)</u>
	50 or 51
Group A - Computing Science 301-3, 302-3, 400-3, 401-3, 415-3, 416-5 418-3, 419-5.	
Group B - Mathematics 306-3, 401-3, 402-3, 403-3, 406-3.	
Group C - Computing Science 305-3, 351-3, 354-3, 370-3, 404-4.	
Group D - Computing Science 371-3, 380-3, 390-3, 410-3, 451-3, 491-3.	

Degree

Students may obtain a B.A. or a B.Sc. depending on the direction of their concentration and content of their overall programme. (There are two plans leading to a B.A., one to a humanities and one to a business oriented degree.) All programmes have to be approved by a programme advisor.

Plan A: B.Sc.

Students wishing to obtain a B.Sc. must complete at least 15 credit hours approved by a programme advisor in a natural or social science or in mathematics of which six credit hours must be in upper division courses.

Their choice of courses must include one of the following groups:

- (1) either Computing Science 390-3, 410-3, Mathematics 402-3 OR
- (2) Mathematics 406-3, Computing Science 451-3, 491-3. Students wishing to obtain an honors degree must complete a research project in a Science, Mathematics, or Computing Science related topic for at least three credits (Computing Science 415-3).

Plan B: B.A. (Relating to Humanistic Studies)

Students wishing to obtain a B.A. under Plan B must complete at least 15 credit hours approved by a program advisor in a humanistic concentration of which at least six hours must be in upper division courses. Their choice of Computing Science courses must include Computing Science 290-3 or 390-3, Computing Science 351-3, 354-3, 380-3, 410-4 and at least five credit hours in a creative project (Computing Science 416-5). Students wishing to obtain an honors degree must complete eight hours of special projects (Computing Science 415-3 and 416-5). Students in this programme will have their possible needs in Mathematics especially evaluated.

Plan C: B.S. (Relating to Commerce and Economics)

Students wishing to obtain a B.A. under Plan C must complete at least 15 credit hours approved by a program advisor in Economics and Commerce of which at least six hours must be in upper division courses. Their choice of Computing Science courses must include Computing Science 290-3 or Computing Science 390-3, and Computing Science 302-3, 305-3, 371-3, and Computing Science 404-4. Students who wish to obtain an honors degree must complete a research project in a business or economics related topic for at least three credits (Computing Science 415-3).

### Minor Programmes

Students majoring or obtaining an honors degree in any field in the Arts or Sciences may combine their study with a minor concentration in Computing Science. Students must discuss their programme with a programme advisor before signing up for courses.

The following lower division courses are required for undergraduate minors in Computing Science: Computing Science 100-3, 102-2, at least two credits in Computing Projects in the Arts and Sciences, Computing Science 200-3 or Computing Science 201-4 and Computing Science 260-3.

Students minoring in Computing Science need to complete at least 15 credits in upper division courses. The following sequences are recommended for students in:

Chemistry and Physics - Computing Science 301-3, 305-3, 351-3, 451-3, Mathematics 406-3.

Life and Social Sciences - Computing Science 305-3, 351-3, 360-3, 410-3, 451-3 (Computing Science 124-3 is required.)

Mathematics - Computing Science 301-3 and four courses selected from Computing Science 305-3, 351-3, 354-3, 410-3, Mathematics 306-3, 401-3, 402-3, 403-3, 406-3. (However, these courses cannot be used to satisfy both the 30 hours Mathematics upper division and the 15 hours Computing Science upper division requirements.)

Business and Management - Computing Science 301-3, 302-3, 370-3, 371-3, 404-4.

Humanities - Computing Science 351-3, 380-3, 354-3, at least five credit hours in a special research project (Computing Science 416-5). All minors who want to develop skills in manipulating computer controlled instruments and display devices (Computing Science 491-3) should note that they will require some background in electricity and mechanics (Computing Science 290-3 is adequate to provide sufficient information in these areas to enable most students to take Computing Science 491-3). Students in this programme will have their possible needs in Mathematics especially evaluated.

General Support in Computing Science for Students Who Wish to Learn Something about Computing Science but Remain Short of Developing a Minor

Computers may be one of the most dominant though apparently unobtrusive features of everyday life. Some knowledge about computers is increasingly necessary for every educated person. Also, a certain amount of knowledge about computers and what to do with them is helpful in almost every practical and theoretical pursuit.

The Computing Science Programme at Simon Fraser University is

so designed that students may enter and leave the programme acquiring in the process as much of a basic background in computing and computer applications as they may need. The programme is also designed so that the student does not get caught in a cul-de-sac. If a student needs additional work or develops a special interest, he can continue in the Computing Science sequence without loss of time.

A number of minimal programmes are shown also (they may be expanded if desired). It should be noted, however, that a Mathematics background equivalent to Computing Science 124-3 is recommended for all students taking Computing Science courses.

Minimal Desirable Programme in Computing I:

Computing Science

- 100-3 Introduction to Computing
- 260-3 Social Implications of a Computerized Society  
(the student may add:-)
- 102-2 Introduction to a High Level Programming Language (PL/1)

Minimal Desirable Programme in Computing II: For Commerce

Computing Science

- 102-2 Introduction to a High Level Programming Language  
(However the student is warned that without Computing Science 100-3, he will just acquire the bare bones of a programming language.)



Commerce

337-3 Business Data Processing

If the student has taken Computing Science 100-3, it is recommended that he also take Computing Science 260-3 Social Implications of a Computerized Society.

Minimal Desirable Programme in Computing III: Minimal Programming Skills

Computing Science

100-3 Introduction to Computing

102-2 Introduction to a High Level Programming Language (PL/1)

Two credits in Computing Projects in the Arts and Sciences

Minimal Desirable Programme in Computing IV: For Education Students

Computing Science

100-3 Introduction to Computing

362-3 Educational Uses of Computers

If possible, the Education students ought to take Computing Science 260-3 Social Implications of a Computerized Society as well.

Expansion of Minimal Programmes

Students who have completed the five credit core course sequence (Computing Science 100-3 Introduction to Computing and Computing Science 102-2 Introduction to a High Level Programming Language PL/1) and who

have taken at least two credits in ~~Computing Projects~~ in the Arts and Sciences <sup>page 20</sup> / may take any of the following ~~courses~~ (however the student will have to check for other than Computing Science requirements in some of these courses):

Computing Science

- 240-3           Computers in the Life Sciences
- 250-3           Computer Uses in Environmental Studies
- 260-3           Social Implications of a Computerized Society
- 362-3           Educational Uses of Computers
- 280-3           Computation in the Humanities I
- 290-3           Digital Circuits and Systems
- 380-3           Computation in the Humanities II (The Computer and the Humanist)
- 283-3           Programming Languages
- 350-3           Information and Public Policy

Students who add Computing Science 200-4 Introduction to Software Organization Systems Design may take any of the following additional courses. (However, it should be noted that some of these courses have additional non Computing Science prerequisites or require completion of some of the courses listed above):

Computing Science

- 320-4           Introduction to Automata Theory
- 351-3           Computer Graphics I: Linear Graphs

- 354-3 Information Organization and Retrieval
- 360-3 Computation for Statistical Data Processing
- 370-3 Management and Information Systems I

Students who substitute Computing Science 201-4 (Data and Programme Organization) for Computing Science 200-4 may take all courses with Computing Science 300 numbers. Students going on beyond that point would have the equivalent of minor or major in Computing Science.

DESCRIPTION OF COURSES

In order to oversee the division of the curriculum into basic core and applied branch courses, all core courses will have an asterisk before their course numbers.

The following Mathematics courses are included as part of the Computing Science program requirements. They will be developed and brought forward to Senate for approval.

\* Mathematics 306-3 Introduction to Automata Theory

Finite-state machines. McCulloch-Pitts nets and the equivalence of these concepts. Recognition of sequences by finite-state machines and by nets; regular expressions; Kleene's theorem. Turing machines; a universal Turing machine; unsolvability of the halting problem and of some related problems; computability and recursivity; program machines. (3-1-0)

Prerequisite: Computing Science 100-3, knowledge of a programming language, 5th level standing or permission of instructor.

Mathematics 401-3 Switching Theory and Logical Design

Mathematical foundations, switching devices, minimization of Boolean functions, tabular minimization and multiple-output circuits. Sequential circuits pulse-mode and fundamental mode sequential circuits. Introduction to threshold logic. (3-1-0)

Prerequisite: Computing Science 320-3.

Mathematics 402-3 Automata and Formal Languages

Languages and grammars. Finite automata and regular grammars; context-free grammars and pushdown automata; Turing machines and recursively enumerable (type 0) languages; context-sensitive grammars and linear bounded automata. Operations on languages. Complexity of calculation. Deterministic pushdown automata. (3-1-0)

Prerequisite: Computing Science 320-3.

Mathematics 403-3 Algebraic Theory of Automata

The course gives a development within an abstract algebraic context of several concepts introduced in Computing Science 320-4. Algebraic preliminaries. Semi-automata, recognizers, regular expressions, coverings of automata.

Prerequisites: Computing Science 320-3, Mathematics 432-4 or permission of instructor.

Mathematics 406-3 Numerical Analysis I

Theoretical and practical study of numerical methods appropriate for high speed digital computer solution and a variety of mathematical problems. (3-1-0)

Prerequisites: Computing Science 100-3, Calculus 152-3, Mathematics 232-3, knowledge of a programming language.

Editorial Change, following amendment at Senate meeting, May 7, 1973.

Mathematics 104-3 Elementary Computational Methods

The course is intended to give non-mathematics students an introduction to computational methods and various applications. (3-1-0)

Prerequisite: Knowledge of a programming language.

## Computing Science

### 001-3 Computers and the Activity of Man

The purpose of this course is to provide a basic understanding and knowledge about computers, what they are, what they do, and what they imply. Such information is an increasingly necessary component of the armamentarium of every educated person. Topics covered will be: Programming Computers, Programming Languages, Application of Computers to the World of the Arts, Commerce, Industry, Science, and everyday activity, the implication of Computers for the Future of Man and Society. This is not a computer appreciation course. Students will acquire elementary programming skills and critically analyze examples of contemporary research and thought. (3-0-0)

No special prerequisites. Students who have obtained credit for or are currently enrolled in any other Computing Science course cannot take this course for credit.

### \* 100-3 Introduction to Computing

This course introduces the fundamental concepts and procedures by which problems are defined, described, and implemented on computing machines. The students learn principles of algorithms and their implementation through computer compatible languages. Computing Science 100 is pre-requisite to most courses in the Computing Science Programme. (3-1-0)

No Prerequisites.

### \* 102-2 Introduction to a High Level Programming Language

This course will introduce the student to the PL/I language. PL/I serves as the key language for most subsequent courses in the Computing Science Programme because it is the most comprehensive and versatile language in existence. The purpose of the course is to make the student into a reasonably competent programmer, giving him a tool he can use for all his other work besides upper division courses in Computing Science. (2-1-0)

No Prerequisites.

### \* 118-3 Computing Projects in the Arts and Sciences

The student will work with investigators in different fields in the Arts and Sciences and will be introduced to and solve problems in various disciplines. The student has two options. He may enroll for Computing Science 118-3 in which he will meet a large number of problems in various disciplines that

are amenable to solutions via computers and will be required to do at least three such projects. As an alternative, the student may enroll for short project courses offered by instructors in different departments. The student may enroll for any number of such projects depending on his schedule and availability of instructors. Each of these short project sections carries one credit. Some sections may require prerequisites besides Computing Science 100-3 and 102-2. All sections will not be offered each semester. A list of projects available each semester, their descriptions, and prerequisites for them will be available at the Computing Science office. It is recommended that students enroll for Computing Science 119-3 only if insufficient instructional supervision is available for short Computing Projects in the Arts and Sciences. Different Computing Projects in the Arts and Sciences will be available under the following numbers:

Computing Science

Mathematics	121
Chemistry	131
Physics	132
Biology	141
Kinesiology	142
Geography	151
Archaeology	152
Anthropology	161
Communication Studies	162
History	163
Political Science	164
Sociology	165
Commerce	171
Economics	172
Modern Languages	181
Linguistics	182
English	183
Literature	184
Design	185
Music	186

Prerequisite: Computing Science 100-3, 102-2.

~~124-3 Elementary Computational Methods~~

See page  
18

~~The course is intended to give non-mathematics students an introduction to computational methods and various applications. (3-1-0)~~

~~Prerequisite: Knowledge of a programming language~~

\* 200-4 Introduction to Software Organization (Systems Design)

This course<sup>is</sup> concerned primarily with software organization - and, to a lesser extent, with the hardware of computer systems that support a wide variety of users. Principles of software construction will be covered. The student will be introduced to formal specification languages. Hardware and software concepts for multiprogramming, multiprocessing, and multi-accessing will be reviewed. The general load carried by executive systems will be studied. (3-1-0)

Prerequisites: Computing Science 100-3, 102-2 and at least two credits in Computing Projects in the Arts and Sciences. Mathematics - at the level of Computing Science 124-3. (Not for Computing Science Majors)

\* 201-4 Data and Programme Organization

This course reviews the basic organization of programmes, data, and control languages and input/output routines. Advanced methods will be introduced for the design and implementation of large programmes including the need for, type of, and implementation of modular designed programmes. (3-1-0)

Prerequisites: Computing Science 100-3, 102-2 and at least two credits of Computing Projects in the Arts and Sciences. (For Computing Science Majors)

240-3 Computers in the Life Sciences

Data acquisition systems in biology and medicine. Uses of special displays. Monitoring of physiological activities. Computation for studies using isotopes. Computers in radiology and nuclear medicine. Patient monitoring. Medical record systems. (3-0-0)

Prerequisites: Computing Science 100-3, 102-2, at least two credits in Computing Projects in the Arts and Sciences, one course in Introductory Statistics, two appropriate courses in the Life Sciences.

### 250-3 Computer Uses in Environmental Studies

Data acquisition systems for monitoring environmental variables. Problems in air and water pollution that are particularly amenable to solution by computer processing procedures. Use of inventories of environmental resources and information systems in emergencies. The use of simulation and mathematical models. (3-1-0)

Prerequisites: Computing Science 100-3 and 102-2, at least two credits in Computing Projects in Arts and Science, at least two appropriate courses in the Environmental Sciences.

### \* 260-3 Social Implications of a Computerized Society

An examination of social processes that are being automated and implications for "good" and "evil" that may be entailed in the automation of procedures by which goods and services are allocated. Examination of what are "dehumanizing" and "humanizing" parts of systems and how can systems be designed to have a humanizing effect. (3-0-0)

Prerequisites: Computing Science 100-3 or 102-2. (Philosophy 105-3 recommended). This course is a requirement in all major, honors, and minor programmes in Computing Science.

### 280-3 Computation in the Humanities

This is the first of a two semester course designed to present the student with an overview of the use of computers in humanistic work and to provide an opportunity to acquire some experience in basic and advanced text handling procedures, construction and processing of dictionaries, style and content analysis and to review the uses of computers in literary research and history. Students will be introduced to SNOBOL. (3-1-0)

Prerequisites: Computing Science 100-3 and at least two credits in Computing Projects in the Arts and Sciences. At least six credits in English, Linguistics, Foreign Language, Music, or a Fine Arts subject.



### 283-3 Programming Languages

This course introduces the student to the structures of different programming languages. Global properties of algorithmic languages will be compared including scope of storage allocation, grouping statements, control of programme logic, type of procedures implemented, default mechanisms, and debugging facilities. Students will learn to evaluate different languages and when some are of greater use than others.

Prerequisites: Computing Science 100-3, 102-2, at least two credits in Computing Projects in the Arts and Sciences, at least one course in Grammar, a Foreign Language, or Linguistics. (3-1-0)

### 290-3. Introduction to Digital Systems

The physical principles underlying digital circuitry will be developed. Digital circuit components will be introduced and typical digital systems will be described. The aim is to give those with minimal background in the physical sciences an understanding of the physical limits which govern the organization and performance of computers.

(Note:- This course may not be taken for credit by those who have obtained credit for or are concurrently registered in Computing Science 390 or Physics 204). (3-1-0)

Prerequisite: Computing Science 100-3.

### \* 291-3 Analogue and Digital Circuits

An introduction to the principles of electrical circuits. Tools for transient and frequency analysis will be developed. These will be applied to the design of system components with particular emphasis on digital integrated circuits. (3-1-0)

Prerequisites: Physics 204, Computing Science 100-3.

### \* 301-3 Applied Programming I

This course is designed to give the student practice and direct exposure to the functions of and techniques applied by professional programmers. Topics include among others, system software, linkage, editor functions, basic debugging techniques, telecommunications, system accounting and security, methods of control and performance measurement and project management. The course consists of a series of assignments, tutorials and seminars given by faculty and computing centre staff. (3-1-0)

Prerequisite: Computing Science 201-4.

\* 302-3 Applied Programming II

This course emphasizes business and scientific systems development, maintenance and documentation. Topics include use of on-line systems, graphic output, user consultation, programme library development, maintenance and documentation, selecting an application language, system life cycle. The course consists of a series of assignments, tutorials, and seminars given by the faculty and computing centre staff.

Prerequisite: Computing Science 301-3 (3-1-0)

305-3 Computer Simulation and Modeling

This course introduces the techniques for modeling and computer simulation of complex systems. The philosophy and practice of modeling and of Monte Carlo simulation will be reviewed. The student will learn at least one simulation language (SIMULA, SIMSCRPT, GPSS, CSS or other languages implemented at Simon Fraser University) and apply it to model and simulate a non-trivial system from his area of interest.

(3-1-0)

Prerequisites: Computing Science 201-4. At least six credits in a Science, Kinesiology, or Business. Some knowledge in statistics and probability (at least at the level of Math 101-3)

350-3 Information and Public Policy

The flow of information will be examined between managerial levels. Quantitative indices for economic and other states will be reviewed and their use in decision making evaluated. The same will be done with social and other qualitative indices. The United States, various European, and the Russian method of using information to reach management decisions will be compared. Impacts of computerized information systems on management decisions will be assessed.

(3-0-0)

Prerequisites: Computing Science 260-3 and permission of instructor.

### 351-3 Computer Graphics I: Linear Graphs

This course introduces the basic concepts and techniques of computer graphics and teaches the use of facilities available in Vancouver. (3-1-0)

Prerequisites: Computing Science 200-4 or Computing Science 201-4.

### 354-3 Information Organization and Retrieval

This course covers techniques for organizing, storing, matching, and retrieving of structured information. It teaches procedures for efficient storing and retrieving and for optimization of search effectiveness. Problems on protection of information against unauthorized search will be reviewed. (3-0-0)

Prerequisites: Computing Science 200-4 or 201-4 and some experience in literature search.

### 360-3 Computation for Statistical Data Processing

This course provides the student with the background required for applying computers to the statistical analysis of scientific data. Special computer controlled instrumentation for data acquisition and display. Graphic and numeric description of data using varieties of available output devices. Curve fitting, linear and non-linear, multiple regression. Special search techniques for data screening. Interactive data processing. (3-1-0)

Prerequisites: Computing Science 200-4 or 201-4, a background in Statistics and a Science are required.

### 362-4 Educational Uses of Computers

The uses of computers as teaching tools will be reviewed in detail, including interactive and batch based computer aided instruction. The student will learn COURSEWRITER and study design approaches to CAI. Special uses of CAI for teaching the handicapped, the very young, and the maladjusted, will be reviewed. (4-0-2)

Prerequisites: Computing Science 100-3 and Education 220-3 (Also, permission of instructor in exceptional cases).

### 370-3 Management and Information Systems I

This is the first of a two semester sequence covering the structure of information systems. The first semester focuses on problems of computer related information system design and procedures of design implementation. PL/I and COBOL will be used to illustrate various techniques of file management in system design. (3-1-0)

Prerequisites: Computing Science 200-4 or 201-4, some background in Accounting and Business.

### 371-3 Management and Information Systems II

Exploration of different file and data base structures that are in use (or have gone out of use). Evaluation of systems and management problems. (3-1-0)

Prerequisites: Computing Science 201-4, 370-3.

### 380-3 Computation in the Humanities II (The Computer and the Humanist)

This course will turn to the more esoteric examination of computer generated art (prose, poetry, designs, music). Special languages for text handling procedures will be reviewed and various problems done using SNOBOL. (3-1-0)

Prerequisite: Computing Science 280-3.

### 390-3 Digital Circuits and Systems

This course introduces the principles of digital circuits and synthesizes the fundamental components into digital systems. The primary aim is to investigate the factors which determine and limit the performance of digital systems rather than to provide recipes for hardware design. (3-1-0)

Prerequisites: Computing Science 100-3 and 291-3 or Physics 331.

### \* 400-3 Hardware-Software Architecture I

The course explores functional properties of digital computer systems. Emphasis is on the operational characteristics as of concern to the systems programmer. Major topics covered are: Organization of Main I Storage, Machine Language, Design, Simulators and Interpreters, CPU, I/O Interaction, a large system will be examined in detail. (3-0-0)

Prerequisite: Computing Science 302-3.

\* 401-3 Hardware-Software Architecture II

This is the second semester of the hardware-software architecture sequence. Topics covered include: System 360/370\* and its assembly language, supervisory software packages, design of job control language, special topics (dynamic and virtual storage techniques), microprogramming systems, special purpose hard wired systems. (3-0-0)

Prerequisite: Computing Science 400-3

404-4 Computer System Measurement and Evaluation

This course introduces the major problems encountered and choice of available methods to evaluate suitability and performance of a computer system. Topics include evaluation of objectives, economics of computers, measurement tools and techniques, analysis of performance, special problems. (4-1-0)

Prerequisites: Computing Science 400-3 and 302-3, working knowledge of applied statistics.

410-4 Artificial Intelligence

This course covers computer models that simulate highly organized intellectual activities. Topics will include heuristic methods of problem solution, including the uses of list processing languages, simulation of cognitive behavior and of self organizing systems, and a survey of examples from representative application areas. (4-0-1)

Prerequisite: Computing Science 301-3

411-5 Practicum in Information Science I

412-5 Practicum in Information Science II

413-5 Practicum in Information Science III

Special arrangements may be made for a supervised work-study programme. Students must apply for admission to this programme at least six months prior to actual enrollment.

415-3 Special Research Projects

To be individually arranged.

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\* or the system currently used by the University

416-5 Special Research Projects

To be individually arranged

.418-3 Special Topics in Computing Science I

These are special topics that will be individually announced during the preceding year depending on availability of faculty and student interest.

419-5 Special Topics in Computing Science II

These are special topics that will be individually announced during the preceding year depending on availability of faculty and student interest.

451-3 Computer Graphics II: Advanced Graphics

Two and three dimensional representations, interactive graphics, animation, extension of existing languages, and specification of special languages for graphics.

(3-1-0)

Prerequisites: Computing Science 301-3 and 351-3

491-3 Computers in Real-Time Experiments

This course investigates the problem of real-time computer systems for measurement and control and hard and software requirements of real-time systems. Students will do individual projects of designing a real-time system for an area of application.

(3-0-1)

Prerequisites: Computing Science 290-3 or 390-3, 301-3 and 305-3.

493-1 Colloquium in Interdisciplinary Topics I

(1-0-0)

Prerequisites: Computing Science 100-3 and at least 60 semester hours credit.

494-1 Colloquium in Interdisciplinary Topics II

(1-0-0)

Prerequisites: Computing Science 100-3 and at least 60 semester hours credit.

### REQUIREMENTS FOR FACULTY

The number of faculty needed to implement the proposed programme has been derived by assuming that all but the most central, important courses will be taught once every two or even three years and by not counting courses of relevance to the programme but offered now by other departments (or in the planning stages).

There are four categories of teachers required for the proposed programme.

#### I. Faculty in Computing Science

These are faculty at the doctoral level in Computing Science.

Five faculty positions will be needed to teach core courses in Computing Science, aid with tutorials (there will be no graduate students) and carry student research projects. In addition, one full-time technical assistant will be required to help with preparation of teaching materials (a large number of programming language simulators are used), aid in special projects, advise students on debugging problems, help out with tutorials and keep track of used educational computer time.

#### II. Faculty on Joint Appointments

These are faculty at the level of tenure track with areas of concentration (not in Computing Science but with sufficient background and experience to teach courses in Computing Science and whose



interests combine Computing Science and some other field. Needed are four full-time (or eight part-time) faculty positions. They would be apportioned as follows (counting 1/2 load per position).

In the Faculty of Arts:

Archaeology, Commerce, Geography and Linguistics

In the Faculty of Interdisciplinary Studies:

Communications and Kinesiology

In the Faculty of Science:

Biology or Chemistry or Physics, Mathematics

Joint appointments are known to create a large number of administrative problems. It is recognized that ways and means will have to be found to solve them.

### III. Faculty for Occasional Courses and Projects

These are faculty who may be interested to teach an occasional course in Computing Science and may or may not have to rely for support on Computing Science faculty or staff. No more than one course of this type a semester is contemplated at this time so that equivalent support for one 1/2 to 3/4 time appointment is required.

### IV. Special Arrangements

A number of courses in Computing Science will be taught

through special arrangement with the staff of the Simon Fraser  
Computing Facility. Equivalent support for 1/2 time appointment  
will be needed.

### PROGRAMME PHASE DEVELOPMENT

It is planned to have the full programme operating by academic year 1975-76. Faculty will be added as follows:

- 1973: Two full-time faculty in Computing Science and five joint appointments (Commerce, Geography, Kinesiology, Linguistics, Mathematics).
- 1974: One full-time faculty in Computing Science, two joint appointments (Archaeology, Biology or Chemistry or Physics) and equivalent appointment for staff in the Simon Fraser Computing Facility. Also one more clerical position will be required.
- 1975: The remaining appointments and equivalent 1/2 time appointment for additional courses.

## EDUCATIONAL COMPUTER TIME

Computer time is a commodity required for almost all courses in the programme. The amount needed may range from a few seconds to ten minutes central processor time per student for different courses. Accounting of computer time is made difficult because the bookkeeping involved to monitor use for each student would be very costly (so that student time is accounted in aggregates) and because there is a different charge for the use of different machine components. A fair estimate at this time is an average cost for computer usage of \$7.50 per student per course. Since most courses in the Computing Science Programme are cross listed with other departments, it may be best to provide a mechanism whereby all educational computer time for computing science courses is made available through the Computing Science Programme.

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 001

Title:

Sub-title or Description:  
(see justification)

Computers and the Activity of Man

Credit hours: 3

Vector Description: 3-0-0

Pre-Requisite(s):

No special prerequisites. Students who have obtained credit for or are currently enrolled in any other Computing Science course cannot take this course for credit.

2. ENROLLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Twice yearly.

When will course first be offered?

1973 - 3

3. JUSTIFICATION

- A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

The purpose of this course is to provide a basic understanding and knowledge about computers, what they are, what they do, and what they imply. Such information is an increasingly necessary component of the armamentarium of every educated person. This is not just a computer appreciation course. Students will acquire elementary programming skills and critically analyze examples of contemporary research and thought.

- B. What is the range of topics that may be dealt with in the course?

Programming Computers, Programming Languages, Application of Computers to the World of the Arts, Commerce, Industry, Science, and everyday activity, the Implication of Computers for the Future of Man and Society.

2.

C. How does this course fit the goals of the program?

Elective.

D. How does this course affect degree requirements?

Not required.

E. What are the calendar changes necessary to reflect the addition of this course?

New Course

F. What course, if any, is being dropped from the calendar if this course is approved?

None

G. What is the nature of student demand for this course?

Unknown

H. Other reasons for introducing the course.

New Program; general interest course.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Rotated among interested faculty. Initially taught by J. Sterling.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some minor supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 100 Title: Introduction to Computing

Sub-title or Description:  
(see justification)

Credit hours: 3 Vector Description: 3-1-0

Pre-Requisite(s):

No pre-requisites

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Twice yearly.

When will course first be offered?

1973 - 1

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course introduces the fundamental concepts and procedures by which problems are defined, described, and implemented on computing machines. Computing Science 100 is pre-requisite to most courses in the Computing Science Program.

B. What is the range of topics that may be dealt with in the course?

The students learn principles of algorithms and their implementation through computer compatible languages.



2.

C. How does this course fit the goals of the program?

Key core course.

D. How does this course affect degree requirements?

Required course (but students may be excused if they demonstrate mastery of course content).

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

(Initially taught by T. Sterling.) Requires grasp of fundamentals of Computing Science but could be taught by very well informed faculty member with good experience in systems work and willing to fill in where he is weak.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

[This course was approved by Senate,  
November, 1972 and is included here  
for information.]

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 102

Title: Introduction to a High  
Level Programming Language (PL/I)

Sub-title or Description:  
(see justification)

Credit hours: 2

Vector Description: 2-1-0

Pre-Requisite(s):

No pre-requisites.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Spring):  
Every semester.

When will course first be offered?  
Summer, 1973.

3. JUSTIFICATION

A. What is the detailed description of the course including  
differentiation from lower level courses, from similar courses  
in the same department, and from courses in other departments  
in the University?

PL/I serves as the key language for most subsequent courses in the  
Computing Science Program because it is the most comprehensive and  
versatile language in existence. The purpose of the course is to make  
the student into a reasonably competent programmer, giving him a tool he  
can use for all his other work besides upper level courses in Computing  
Science.

B. What is the range of topics that may be dealt with in the course?  
This course will introduce the student to the PL/I language.

2.

C. How does this course fit the goals of the program?

Key Core Course.

D. How does this course affect degree requirements?

Required course (but students may be excused if they demonstrate sufficient mastery of course content).

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Computing Science Ph.D. or faculty on joint appointment who has ample experience with PL/I.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing Time. Some supplies.

Approval:

Dean of Division:

Senate:

## DIVISION OF GENERAL STUDIES

### NEW COURSE PROPOSAL

#### 1. CALENDAR INFORMATION

Program. Computing Science Course Number: 118

Title: Computing Project in  
The Arts and Sciences.

Sub-title or Description:  
(see justification)

Credit Hours: 3      Vector Description: 0-3-0

Pre-Requisite(s): Computing Science 100-3, 102-2.

#### 2. ENROLLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Spring):  
Every semester - depending on faculty availability.

When will course first be offered?

1973, Fall

#### 3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

The student will work with investigators in different fields in the Arts and Sciences and will be introduced to and solve problems in various disciplines. The student has two options. He may enroll for Computing Science 118-3 in which he will meet a large number of problems in various disciplines that are amenable to solutions via computers and will be required to do at least three such projects. As an alternative, the student may enroll for short project courses offered by instructors in different departments. The student may enroll for any number of such projects depending on his schedule and availability of instructors. Each of these short project sections carries one credit. Some sections may require prerequisites besides Computing Science 100-3 and 102-2. All sections will not be offered each semester. A list of projects available each semester, their descriptions, and prerequisites for them will be available at the Computing Science office. It is recommended that students enroll for Computing Science 118-3 only if insufficient instructional supervision is available for short Computing Projects in the Arts and Sciences. Different Computing Projects in the Arts and Sciences will be available under the following numbers: 121 (Mathematics), 131 (Chemistry), 132 (Physics), 141 (Biology), 142 (Kinesiology), 151 (Geography), 152 (Archeology), 161 (Social Science), 171 (Commerce), 172 (Economics), 181 (Modern Languages), 182 (Linguistics), 183 (English), 184 (Literature), 185 (Design), 186 (Music).

2.

C. How does this course fit the goals of the program?

Students acquire programming skills and simultaneously become acquainted with different problems in the Arts and Sciences.

D. How does this course affect degree requirements?

Required for some later courses (but students may be excused if they have had considerable programming experience).

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty will be drawn from all departments.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:



DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 124 Title: Elementary Computational  
Methods  
Sub-title or Description: (see justification)

Credit Hours: 3 Vector Description: 3-1-0

Pre-requisite(s): Knowledge of a programming language.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered(e.g. yearly, every Spring, twice yearly, Fall and Spring):

Yearly

When will course first be offered?

1974

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level course, from similar courses in the same department, and from courses in other departments in the University?

The course is intended to give non-mathematics students an introduction to computational methods and various applications.

B. What is the range of topics that may be dealt with in the course?

See above.

2.

C. How does this course fit the goals of the program?

This is a new course designed especially for students who have no background in computational skills.

D. How does this course affect degree requirements?

Not for Computing Science Majors.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Taught by the Mathematics Faculty.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing Time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science      Course Number: 200      Title:

Sub-title or Description:  
(see justification)

Introduction to Software Organization  
(Systems Design)

Credit Hours: 4

Vector Description: 3-1-0

Pre-Requisite(s):

Computing Science 100-3, 102-2 and at least two credits in Computing Projects in the Arts and Sciences. Mathematics - at the level of Computing Science 124-3.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Every spring.

When will course first be offered?

1974 - 1

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course is concerned primarily with software organization - and, to a lesser extent, with the hardware of computer systems that support a wide variety of users.

B. What is the range of topics that may be dealt with in the course?

Principles of software construction will be covered. The student will be introduced to formal specification languages. Hardware and software concepts for multiprogramming, multiprocessing, and multi-accessing will be reviewed. The general load carried by executive systems will be studied.

2.

C. How does this course fit the goals of the program?

This course is primarily to prepare students who are not further interested in Computing Science for a number of upper level courses in application areas.

D. How does this course affect degree requirements?

Not for Computing Science Majors.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Computing Science Ph.D. or Faculty on Joint Appointment with exceptional systems background.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 201 Title:

Sub-title or Description: Data and Program Organization

(see justification)

Credit Hours: 4 Vector Description: 3-1-0

Pre-Requisite(s):

Computing Science 100-3, 102-2 and at least two credits of Computing Projects in the Arts and Sciences.

2. ENROLLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Every Fall.

When will course first be offered?

1973 - 3

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course teaches the basic organization of programs, data, and control languages and input/output routines.

B. What is the range of topics that may be dealt with in the course?

Advanced methods will be introduced for the design and implementation of large programs including the need for, type of, and implementation of modular designed programs.

2.

C. How does this course fit the goals of the program?

Key core course.

D. How does this course affect degree requirements?

Required course (but students may be excused if they demonstrate mastery of course content).

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.



3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Computing Science Ph.D. (to be added to Faculty).

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:



2.

C. How does this course fit the goals of the program?

Application course.

D. How does this course affect degree requirements?

Elective.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Joint appointment in appropriate discipline.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science    Course Number: 250    Title: Computer Uses in  
Environmental Studies.  
Sub-title or Description:  
(see justification)

Credit Hours:    3    Vector Description:    3-1-0

Pre-Requisite(s):

Computing Science 100-3 and 102-2, at least two credits in Computing Projects  
in Arts and Sciences, at least two appropriate courses in the Environmental  
Sciences.

2. ENROLLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Spring):  
Every second spring.

When will course first be offered?  
1975

3. JUSTIFICATION

A. What is the detailed description of the course including  
differentiation from lower level courses, from similar courses  
in the same department, and from courses in other departments  
in the University?

This course covers major applications of automation and computers  
to environmental studies.

B. What is the range of topics that may be dealt with in the course?  
Data acquisition systems for monitoring environmental variables. Problems  
in air and water pollution that are particularly amenable to solution by  
computer processing procedures. Use of inventories of environmental  
resources and information systems in emergencies. The use of simulation  
and mathematical models.

2.

C. How does this course fit the goals of the program?

Application course.

D. How does this course affect degree requirements?

Elective.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Joint appointment in appropriate discipline.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 260 Title: Social Implications of a Computerized Society.

Sub-title or Description:

(see justification)

Credit Hours: 3 Vector Description: 3-0-0

Pre-Requisite(s):

Computing Science 100-3 and 102-2. (Philosophy 103-3 recommended).

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Twice yearly - Fall and Spring.

When will course first be offered?

1974- 1

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

An examination of social processes that are being automated, and implications for "good" and "evil" that may be entailed in the automation of procedures by which goods and services are allocated. Examination of what are "dehumanizing" and "humanizing" parts of systems and how can systems be designed to have a humanizing effect.

B. What is the range of topics that may be dealt with in the course?

See above.



2.

C. How does this course fit the goals of the program?

Computerization of all aspects of human life has far reaching consequences of which students in Computing Science must be made aware.

D. How does this course affect degree requirements?

This course will be required for all major and minor programs.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Initially taught by T. Sterling. Eventually this will be taught through wide participation of interested faculty.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 280 Title: Computation in the Humanities

Sub-title or Description:  
(see justification)

Credit Hours: 3 Vector Description: 3-1-0

Pre-Requisite(s):

Computing Science 100-3 and at least two credits in Computing Projects in the Arts and Sciences. At least six credits in English, Linguistics, Foreign Language, Music, or a Fine Arts subject.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Every fall.

When will course first be offered?

1975 - 3

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This is the first of a two semester course designed to present the student with an overview of the use of computers in humanistic work.

B. What is the range of topics that may be dealt with in the course?

Students will acquire some experience in basic and advanced text handling procedures, construction and processing of dictionaries, style and content analysis and to review the uses of computers in literary research and history. Students will be introduced to SNOBOL.

2.

C. How does this course fit the goals of the program?

Key course for the humanities - social science concentration in computing science.

D. How does this course affect degree requirements?

Elective.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on joint appointment.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 283 Title: Programming Languages

Sub-title or Description:

see justification

Credit Hours: 3 Vector Description: 3-1-0

Pre-Requisite(s):

Computing Science 100-3, 102-2, at least two credits in Computing Projects in the Arts and Sciences, at least one course in Grammar, a Foreign Language, or Linguistics.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Every spring.

When will course first be offered?

1976-1

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course introduces the student to the structures of different programming languages.

B. What is the range of topics that may be dealt with in the course?

Global properties of algorithmic languages will be compared including scope of storage allocation, grouping statements, control of program logic, type of procedures implemented, default mechanisms, and debugging facilities. Students will learn to evaluate different languages and when some are of greater use than others.

2.

C. How does this course fit the goals of the program?

important course linking linguistics to computing science

D. How does this course affect degree requirements?

highly recommended elective for major and minor programs

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

A faculty on Joint Appointment (probably with DML or Computing Science Ph.D.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:



DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 290 Title: Introduction to Digital Systems

Sub-title or Description:

see justification

Credit Hours: 3 Vector Description: 3-1-0

Pre-requisite(s): Computing Science 100-3.

(Note: This course may not be taken for credit by those who have obtained credit for or are currently registered in Computing Science 390 or Physics 204.)

2. ENROLMENT AND SCHEDULING:

Estimated Enrolment:

Semester Offered (e.g. yearly, every spring, twice yearly, Fall and Spring):

Yearly

When will course first be offered?

1974

3. JUSTIFICATION

- A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

The aim is to give those with minimal background in the physical sciences an understanding of the physical limits which govern the organization and performance of computers.

- B. What is the range of topics that may be dealt with in the course?

The physical principles underlying digital circuitry will be developed. Digital circuit components will be introduced and typical digital systems will be described.

2.

C. How does this course fit the goals of the program?

An introduction to physical principles for students without physics or engineering background.

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New Program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Dr. Calvert, Kinesiology.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 291 Title: Analogue and Digital Circuits

Sub-title or Description:

See justification

Credit Hours: 3 Vector Description: 3-1-0

Pre-requisite(s): Physics 204, Computing Science 100-3

2. ENROLMENT AND SCHEDULING:

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Yearly

When will course first be offered?

1974

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

An introduction to the principles of electrical circuits.

B. What is the range of topics that may be dealt with in the course?

Tools for transient and frequency analysis will be developed. These will be applied to the design of system components with particular emphasis on digital integrated circuits.

2.

C. How does this course fit the goals of the program?

For Computing Science majors or strong minors.

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Dr. Calvert, Kinesiology.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number:301 Title:Applied Programming I

Sub-title or Description:

see justification

Credit Hours: 3 Vector Description: 3-1-0

Pre-Requisite(s): Computing Science 201-4

2. ENROLLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Every Fall.

When will course first be offered?  
1975 or 1976 -3

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course is designed to give the student practice and direct exposure to the functions of and techniques applied by professional programmers.

B. What is the range of topics that may be dealt with in the course? Topics include among others, system software, linkage editor functions, basic debugging techniques, telecommunications, system accounting and security, methods of control and performance measurement and project management. The course consists of a series of assignments, tutorials and seminars given by faculty and computing centre staff.

2.

C. How does this course fit the goals of the program?

core course for major and honors programs

D. How does this course affect degree requirements?

required for major and honors programs

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.



3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Jointly taught with staff of Computing Facility under some special arrangement and with participation of Computing Science Ph.D.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

Program. Computing Science Course Number: 302 Title: Applied Programming 11

Sub-title or Description:

see justification

Credit Hours: 3 Vector Description: 3-1-0

Pre-Requisite(s): Computing Science 301-3

**2. ENROLLMENT AND SCHEDULING**

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Every spring.

When will course first be offered?

1976 or 1977 -1

**3. JUSTIFICATION**

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course emphasizes business and scientific systems development, maintenance and documentation.

B. What is the range of topics that may be dealt with in the course?

Topics include use of on-line systems, graphic output, user consultation, program library development, maintenance and documentation, selecting an application language, system life cycle. The course consists of a series of assignments, tutorials, and seminars given by the faculty and computing centre staff.

2.

C. How does this course fit the goals of the program?

core course for major and honors programs

D. How does this course affect degree requirements?

required for major and honors programs

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Jointly taught with staff of Computing Facility under special arrangement  
and with participation of Computing Science Ph.D.

B. What are the special space and/or equipment requirements  
for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

**Program.** Computing Science **Course Number:** 305 **Title:** Computer Simulation and Modeling  
**Sub-title or Description:**

see justification

**Credit Hours:** 3 **Vector Description:** 3-1-0

**Pre-Requisite(s):**

Computing Science 201-4. At least six credits in a Science, Kinesiology, or Business. Some knowledge in statistics and probability (at least at the level of Math 101).

**2. ENROLMENT AND SCHEDULING**

**Estimated Enrolment:**

**Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Every second spring. Spring):**

**When will course first be offered?**

1974-1

**3. JUSTIFICATION**

**A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?**

This course introduces the techniques for modeling and computer simulation of complex systems.

**B. What is the range of topics that may be dealt with in the course?**

The philosophy and practice of modeling and of Monte Carlo simulation will be reviewed. The student will learn at least one simulation language (SIMULA, SIMSCRIPT, GPSS, CSS or other languages implemented at Simon Fraser University) and apply it to model and simulate a non-trivial system from his area of interest.

2.

C. How does this course fit the goals of the program?

applications course

D. How does this course affect degree requirements?

highly recommended elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on joint appointment or Computing Science Ph.D.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 350 Title: Information and Public Policy

Sub-title or Description:

see justification

Credit Hours: 3

Vector Description: 3-0-0

Pre-Requisite(s): Computing Science 260-3 and permission of instructor.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Every second fall.

When will course first be offered?

1976 -3

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

The flow of information between managerial levels will be examined.

B. What is the range of topics that may be dealt with in the course?

Quantitative indices for economic and other states will be reviewed and their use in decision making evaluated. The same will be done with social and other qualitative indices. The United States, various European, and the Russian method of using information to reach management decisions will be compared. Impacts of computerized information systems on management decisions will be assessed.



2.

C. How does this course fit the goals of the program?  
applications course

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program, Computing Science    Course Number: 351    Title: Computer Graphics I: Linear Graphs  
Sub-title or Description:

see justification

Credit Hours:    3    Vector Description:    3-1-0

Pre-Requisite(s): Computing Science 200-4 or Computing Science 201-4.

2. ENROLLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Every fall.

When will course first be offered?  
1973.-3

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course introduces the basic concepts and techniques of computer graphics and teaches the use of facilities available in Vancouver.

B. What is the range of topics that may be dealt with in the course?

Data structures, linear graphs, list structures, special implementation languages.

2.

C. How does this course fit the goals of the program?

applications course

D. How does this course affect degree requirements?

highly recommended elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment (initially Dr. Peucker) or  
Computing Science Ph.D.

B. What are the special space and/or equipment requirements  
for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

**Program.** Computing Science    **Course Number:** 354    **Title:** Information Organization and Retrieval

**Sub-title or Description:**

see justification

**Credit Hours:** 3    **Vector Description:** 3-0-0

**Pre-Requisite(s):** Computing Science 200-4 or 201-4 and some experience in literature search.

**2. ENROLLMENT AND SCHEDULING**

**Estimated Enrolment:**

**Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Every second fall. Spring):**

**When will course first be offered?**

1973 or 1974.-3

**3. JUSTIFICATION**

**A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?**

This course covers techniques for organizing, storing, matching, and retrieving of structured information.

**B. What is the range of topics that may be dealt with in the course?**

It teaches procedures for efficient storing and retrieval and for optimization of search effectiveness. Problems on protection of information against unauthorized search will be reviewed.

2.

C. How does this course fit the goals of the program?

applications course

D. How does this course affect degree requirements?

highly recommended for Computing Science majors

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment (possibly with Chemistry) or  
Computing Science Ph.D.

B. What are the special space and/or equipment requirements  
for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:



**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

Program. Computing Science    Course Number: 360    Title: Computation for Statistical Data Processing.

Sub-title or Description:

see below

Credit Hours:    3    Vector Description: 3-1-0

Pre-Requisite(s): Computing Science 200-4 or 201-4, a background in Statistics and a Science are required.

**2. ENROLLMENT AND SCHEDULING**

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Every second spring.

When will course first be offered?  
1975 or 1976-1

**3. JUSTIFICATION**

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course provides the student with the background required for applying computers to the statistical analysis of scientific data.

B. What is the range of topics that may be dealt with in the course?

Special computer controlled instrumentation for data acquisition and display. Graphic and numeric description of data using varieties of available output devices. Curve fitting, linear and non-linear multiple regression. Special search techniques for data screening. Interactive data processing.

2.

C. How does this course fit the goals of the program?

applications

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program:

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment or maybe offered through Psychology  
(Dr. Koopman teaches a course similar to Computing Science 360).

B. What are the special space and/or equipment requirements  
for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 362 Title: Educational Uses of Computers

Sub-title or Description:

See justification

Credit Hours: 4 Vector Description: 4-0-2

Pre-Requisite(s): Computing Science 100-3 and Education 220-3 (also permission of instructor in exceptional cases).

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Every summer.

When will course first be offered?

1974-2

3. JUSTIFICATION

- A. What is the detailed description of the course including differentiation from lower level course, from similar courses in the same department, and from courses in other departments in the University?

The uses of computers as teaching tools will be reviewed in detail, including interactive and batch based computer aided instruction.

- B. What is the range of topics that may be dealt with in the course?

The student will learn COURSEWRITER and study design approaches to CAI. Special uses of CAI for teaching the handicapped, the very young, and the maladjusted will be reviewed.

2.

C. How does this course fit the goals of the program?

service course for the faculty of Education. Course is designed especially for high school and junior college teachers.

D. How does this course affect degree requirements?

not for computing science majors

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Through Education Faculty.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

**Program.** Computing Science    **Course Number:** 370    **Title:** Management and Information Systems I  
**Sub-title or Description:**  
    see justification

**Credit Hours:** 3                      **Vector Description:** 3-1-0

**Pre-Requisite(s):** Computing Science 200-4 or 201-4, some background in Accounting and Business.

**2. ENROLLMENT AND SCHEDULING**

**Estimated Enrolment:**

**Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):**  
    Every fall.

**When will course first be offered?**  
    1974 -3

**3. JUSTIFICATION**

**A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?**

This is the first of a two semester sequence covering the structure of information systems.

**B. What is the range of topics that may be dealt with in the course?**

The first semester focuses on problems of computer related information system design and procedures of design implementation. PL/I and COBOL will be used to illustrate various techniques of file management in system design.

2.

C. How does this course fit the goals of the program?

To be cross listed with Commerce. This course is especially designed to provide students heading for a business career with computing background.

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.



3.

**4. BUDGETARY AND SPACE FACTORS**

**A. Which faculty will be available to teach this course?**

Faculty on Joint Appointment with Commerce and Economics.

**B. What are the special space and/or equipment requirements for this course?**

Access to card punches or consoles.

**C. Any other budgetary implications of mounting this course:**

Computing time. Some supplies.

**Approval:**

**Dean of Division:**

**Senate:**

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

**Program.** Computing Science Course Number: 371

**Title:** Management and Information Systems II

**Sub-title or Description:**

see justification

**Credit Hours:**

3

**Vector Description:**

3-1-0

**Pre-Requisite(s):** Computing Science 201-4, 370-3.

**2. ENROLMENT AND SCHEDULING**

**Estimated Enrolment:**

**Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):**  
Every spring.

**When will course first be offered?**

1975-1

**3. JUSTIFICATION**

**A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?**  
see below

**B. What is the range of topics that may be dealt with in the course?**

Exploration of different file and data base structures that are in use (or have gone out of use). Evaluation of systems and management problems.

2.

C. How does this course fit the goals of the program?

To be cross listed with Commerce. This course is especially designed to provide students heading for a business career with computing background.

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment with Commerce and Economics.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment with Commerce and Economics.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 380

Title: Computation in the  
Humanities 11 (The Computer  
and the Humanist)

Sub-title or Description:

see justification

Credit Hours: 3

Vector Description: 3-1-0

Pre-Requisite(s): Computing Science 280-3.

2. ENROLLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Spring):  
Every second spring.

When will course first be offered?

1976-1

3. JUSTIFICATION

A. What is the detailed description of the course including  
differentiation from lower level courses, from similar courses  
in the same department, and from courses in other departments  
in the University?

see below

B. What is the range of topics that may be dealt with in the course?

This course will turn to the more esoteric examination of computer  
generated art (prose, poetry, designs, music). Special languages  
for text handling procedures will be reviewed and various problems  
done using SNOBOL.

2.

C. How does this course fit the goals of the program?

Second part of the humanities sequence.

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS.

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:



DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 390 Title: Digital Circuits and Systems

Sub-title or Description:

Credit Hours: 3 Vector Description: 3-1-0

Pre-requisite(s): Computing Science 100-3 and 291-3 or Physics 331.

2. ENROLMENT AND SCHEDULING:

Estimated Enrolment: 25

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Yearly

When will course first be offered?

1975

3. JUSTIFICATION

- A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

The primary aim is to investigate the factors which determine and limit the performance of digital systems rather than to provide recipes for hardware design.

- B. What is the range of topics that may be dealt with in the course?

This course introduces the principles of digital circuits and synthesizes the fundamental components into digital systems.

2.

C. How does this course fit the goals of the program?

applications course

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Dr. Calvert, Kinesiology.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

Program. Computing Science Course Number: 400 Title: Hardware-Software  
Architecture I  
Sub-title or Description:

see justification

Credit Hours: 3 Vector Description: 3-0-0

Pre-Requisite(s): Computing Science 302-3.

**2. ENROLLMENT AND SCHEDULING**

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Initially every second fall<sup>Spring</sup>):

When will course first be offered?

1975-3

**3. JUSTIFICATION**

A. What is the detailed description of the course including  
differentiation from lower level courses, from similar courses  
in the same department, and from courses in other departments  
in the University?

The course explores functional properties of digital computer systems.  
Emphasis is on the operational characteristics as of concern to the  
systems programmer.

B. What is the range of topics that may be dealt with in the course?

Organization of Main Storage, Machine Language, Design, Simulators  
and Interpreters, CPU, I/O Interaction, a large system will be examined in  
detail.

2.

C. How does this course fit the goals of the program?

Core course in Computing Science, will be taken almost exclusively by majors and honors students.

D. How does this course affect degree requirements?

required for Computing Science majors.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Computing Science Ph.D.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 401 Title: Hardware-Software Architecture II

Sub-title or Description:

see justification

Credit Hours: 3 Vector Description: 3-0-0

Pre-Requisite(s): Computing Science 400-3.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Initially every second spring.

When will course first be offered?

1976-1

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This is the second semester of the hardware-software architecture sequence.

see below

B. What is the range of topics that may be dealt with in the course?  
System /360-370 and its assembly language, supervisory software packages, design of job control language, special topics (dynamic and virtual storage techniques), microprogramming systems, special purpose hard wired systems.

\* or the system currently used by the University

2.

C. How does this course fit the goals of the program?

Core course in Computing Science, will be taken almost exclusively by majors and honors students.

D. How does this course affect degree requirements?

required for computing science majors

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.



3.

**4. BUDGETARY AND SPACE FACTORS**

**A. Which faculty will be available to teach this course?**

Computing Science Ph.D.

**B. What are the special space and/or equipment requirements for this course?**

Access to card punches or consoles.

**C. Any other budgetary implications of mounting this course:**

Computing time. Some supplies.

**Approval:**

**Dean of Division:**

**Senate:**

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 404

Title: Computer System Measurement and Evaluation.

Sub-title or Description:

see justification

Credit Hours: 4

Vector Description: 4-1-0

Pre-Requisite(s): Computing Science 400-3 and 302-3, working knowledge of applied statistics.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Every second summer. Spring):

When will course first be offered?  
1976.-2

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course introduces the major problems encountered and choice of available methods to evaluate suitability and performance of a computer system.

B. What is the range of topics that may be dealt with in the course?  
Evaluation of objectives, economics of computers, measurement tools and techniques, analysis of performance, special problems.

2.

C. How does this course fit the goals of the program?

Of special interest to students seeking a career in business or industry.

D. How does this course affect degree requirements?

highly recommended elective for Computing Science Majors

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

To be taught under special arrangement with staff of <sup>the</sup> Computing Centre with participation of Computing Science Ph.D.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program. Computing Science Course Number: 410 Title: Artificial Intelligence

Sub-title or Description:

see justification

Credit Hours: 4 Vector Description: 4-0-1

Pre-Requisite(s): Computing Science 301-3

2. ENROLLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Every second summer. Spring):

When will course first be offered?  
1975-2

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course covers computer models that simulate highly organized intellectual activities.

B. What is the range of topics that may be dealt with in the course?

Heuristic methods of problem solution, including the uses of list processing languages, simulation of cognitive behavior and of self organizing systems, and a survey of examples from representative application areas.

2.

C. How does this course fit the goals of the program?

applications course

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Computing Science Ph.D.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

**Program:** Computing Science      **Course Number:** 411      **Title:** Practicum in  
Information Science I  
**Sub-title or Description:**

see justification

**Credit Hours:** 5      **Vector Description:**

**Pre-Requisite(s):**

Admission by special permission. Application must be made at least 6 months in advance.

**2. ENROLLMENT AND SCHEDULING**

**Estimated Enrolment:**

**Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):**  
Every semester.

**When will course first be offered?**

Summer or fall, 1974.

**3. JUSTIFICATION**

**A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?**

Special arrangements may be made for a supervised work-study program. Students must apply for admission to this program at least six months prior to actual enrollment.

**B. What is the range of topics that may be dealt with in the course?**

see above



2.

C. How does this course fit the goals of the program?

prepares students in intense applications of computing science theory and practice to work of the solution of difficult problems under careful supervision.

D. How does this course affect degree requirements?

student has to be accepted for this program

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Supervised by faculty on Joint Appointment of Ph.D. in Computing Science.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

Program. Computing Science Course Number: 412 Title: Practicum in Information  
Science II

Sub-title or Description:

see justification

Credit Hours: 5 Vector Description:

Pre-Requisite(s):

Admission by special permission. Application must be made at least  
6 months in advance.

**2. ENROLLMENT AND SCHEDULING**

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Spring):

Every semester.

When will course first be offered?

Summer or fall, 1974.

**3. JUSTIFICATION**

A. What is the detailed description of the course including  
differentiation from lower level courses, from similar courses  
in the same department, and from courses in other departments  
in the University?

Special arrangements may be made for a supervised work-study program.  
Students must apply for admission to this program at least six months  
prior to actual enrollment.

B. What is the range of topics that may be dealt with in the course?

see above

2.

C. How does this course fit the goals of the program?

prepares students in intense applications of computing science theory and practice to work on the solution of difficult problems under supervision.

D. How does this course affect degree requirements?

student has to apply for this program.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Supervised by faculty on Joint Appointment of Ph.D. in Computing Science.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

**Program:** Computing Science      **Course Number:** 413      **Title:** Practicum in  
Information Science III  
**Sub-title or Description:**

see justification

**Credit Hours:** 5      **Vector Description:**

**Pre-Requisite(s):**

Admission by special permission. Application must be made at least 6 months in advance.

**2. ENROLLMENT AND SCHEDULING**

**Estimated Enrollment:**

**Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):**  
Every semester.

**When will course first be offered?**

Summer or fall, 1974.

**3. JUSTIFICATION**

**A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?**

Special arrangements may be made for a supervised work-study program. Students must apply for admission to this program at least six months prior to actual enrollment.

**B. What is the range of topics that may be dealt with in the course?**

see above

2.

C. How does this course fit the goals of the program?

prepares students in intense application of computing science theory and practice to work on the solution of difficult problems under supervision.

D. How does this course affect degree requirements?

students must be accepted to the program.

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Supervised by faculty on Joint Appointment of Ph.D. in Computing Science.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:



DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 415 Title: Special Research Projects

Sub-title or Description:

To be individually arranged.

Credit Hours: 3

Vector Description:

Pre-Requisite(s):

Admission by special permission

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Offered every semester.

When will course first be offered?

Fall, 1974.

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

To be individually arranged.

B. What is the range of topics that may be dealt with in the course?

To be individually arranged.

2.

C. How does this course fit the goals of the program?

recommended for some students

D. How does this course affect degree requirements?

recommended for some students

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment of Ph.D. in Computing Science.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

**Program.** Computing Science Course Number: 416

**Title:** Special Research Projects

**Sub-title or Description:**

to be individually arranged

**Credit Hours:** 5                      **Vector Description:**

**Pre-Requisite(s):**

to be individually arranged

**2. ENROLLMENT AND SCHEDULING**

**Estimated Enrolment:**

**Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):**

Offered every semester.

**When will course first be offered?**

Fall, 1974.

**3. JUSTIFICATION**

**A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?**

To be individually arranged.

**B. What is the range of topics that may be dealt with in the course?**

to be individually arranged

2.

C. How does this course fit the goals of the program?

recommended for some students

D. How does this course affect degree requirements?

recommended for some students

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment of Ph.D. in Computing Science.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

Program. Computing Science Course Number: 418

Title: Special Topics in  
Computing Science I

Sub-title or Description:

see justification

Credit Hours: 3

Vector Description:

Pre-Requisite(s):

by permission of instructor

**2. ENROLMENT AND SCHEDULING**

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Offered every semester. Spring):

When will course first be offered?

Fall, 1974.

**3. JUSTIFICATION**

A. What is the detailed description of the course including  
differentiation from lower level courses, from similar courses  
in the same department, and from courses in other departments  
in the University?

These are special topics that will be individually announced during the  
preceeding year depending on availability of faculty and student interest.

B. What is the range of topics that may be dealt with in the course?  
see above

2.

C. How does this course fit the goals of the program?  
recommended for some students

D. How does this course affect degree requirements?  
recommended for some students

E. What are the calendar changes necessary to reflect the addition  
of this course?

New course.

F. What course, if any, is being dropped from the calendar if  
this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.



3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment of Ph.D. in Computing Science.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

**Program.** Computing Science    **Course Number:** 419    **Title:** Special Topics in  
Computing Science II

**Sub-title or Description:**

**see justification**

**Credit Hours:** 5                      **Vector Description:**

**Pre-Requisite(s):**

**by permission of instructor**

**2. ENROLLMENT AND SCHEDULING**

**Estimated Enrollment:**

**Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):**  
Offered every semester.

**When will course first be offered?**

Fall, 1974.

**3. JUSTIFICATION**

**A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?**

These are special topics that will be individually announced during the preceding year depending on availability of faculty and student interest.

**B. What is the range of topics that may be dealt with in the course?**

**see above**

2.

C. How does this course fit the goals of the program?

recommended for some students

D. How does this course affect degree requirements?

recommended for some students

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

**4. BUDGETARY AND SPACE FACTORS**

**A. Which faculty will be available to teach this course?**

Faculty on Joint Appointment of Ph.D. in Computing Science.

**B. What are the special space and/or equipment requirements for this course?**

Access to card punches or consoles.

**C. Any other budgetary implications of mounting this course:**

Computing time. Some supplies.

**Approval:**

**Dean of Division:**

**Senate:**

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

Program. Computing Science Course Number: 451 Title: Computer Graphics 11:  
Advanced Graphics

Sub-title or Description:

see justification

Credit Hours: 3 Vector Description: 3-1-0

Pre-Requisite(s): Computing Science 301-3 and 351-3.

**2. ENROLLMENT AND SCHEDULING**

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and  
Spring):  
Every spring (or second spring)

When will course first be offered?  
1974

**3. JUSTIFICATION**

A. What is the detailed description of the course including  
differentiation from lower level courses, from similar courses  
in the same department, and from courses in other departments  
in the University?

see below

B. What is the range of topics that may be dealt with in the course?

Two and three dimensional representations, interactive graphics, animation,  
extension of existing languages, and specification of special languages for  
graphics.

2.

C. How does this course fit the goals of the program?

applications course

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

Faculty on Joint Appointment (initially Dr. Peucker) or Computing Science Ph.D.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies.

Approval:

Dean of Division:

Senate:

**DIVISION OF GENERAL STUDIES**

**NEW COURSE PROPOSAL**

**1. CALENDAR INFORMATION**

Program: Computing Science      Course Number: 491      Title: Computers in Real-Time Experiments

Sub-title or Description:

see justification

Credit Hours: 3      Vector Description: 3-0-1

Pre-Requisite(s): Computing Science 290-3 or 390-3, 301-3 and 305-3.

**2. ENROLMENT AND SCHEDULING**

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Every second spring or every summer

When will course first be offered?

1974 or 1975-2

**3. JUSTIFICATION**

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

This course investigates the problem of real-time computer systems for measurement and control and hard and software requirements of real-time systems. Students will do individual projects of designing a real-time system for an area of application.

B. What is the range of topics that may be dealt with in the course?

see above



2.

C. How does this course fit the goals of the program?

application

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

**4. BUDGETARY AND SPACE FACTORS**

**A. Which faculty will be available to teach this course?**

By faculty members in the Sciences who do active research using mini computers by special arrangement.

**B. What are the special space and/or equipment requirements for this course?**

Access to card punches or consoles.

**C. Any other budgetary implications of mounting this course:**

Computing time. Some supplies.

**Approval:**

**Dean of Division:**

**Senate:**

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 493 Title: Colloquium in  
Interdisciplinary Topics I

Sub-title or Description::

See justification

Credit Hours: 1 Vector Description: 1-0-0

Prerequisite(s):

At least 60 hours of completed credits and CMPT 100-3.

2. ENROLMENT AND SCHEDULING

Estimated Enrolment: 15

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):

Every fall and spring semester.

When will course first be offered?

1974-3

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

Offers students the opportunity to discuss a wide variety of subjects that are relevant to computing science (or vice-versa).

B. What is the range of topics that may be dealt with in the course?

See above.

2.

C. How does this course fit the goals of the program?

applications course

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

No special faculty requirement, but all Faculty will be asked to participate from time to time.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies. Some honoraria monies for visiting lecturers.

Approval:

Dean of Division:

Senate:

DIVISION OF GENERAL STUDIES

NEW COURSE PROPOSAL

1. CALENDAR INFORMATION

Program: Computing Science Course Number: 494

Title: Colloquium In  
Interdisciplinary Topics II

Sub-title or Description:

see justification

Credit Hours: 1

Vector Description: 1-0-0

Pre-Requisite(s):

at least 60 hours of completed credits and CMPT 100-3

2. ENROLMENT AND SCHEDULING

Estimated Enrolment:

Semester Offered (e.g. yearly, every Spring, twice yearly, Fall and Spring):  
Every fall and spring semester.

When will course first be offered?

1975-1

3. JUSTIFICATION

A. What is the detailed description of the course including differentiation from lower level courses, from similar courses in the same department, and from courses in other departments in the University?

offers students the opportunity to discuss a wide variety of topics relevant to Computing Science (or vice versa)

B. What is the range of topics that may be dealt with in the course?

see above

2.

C. How does this course fit the goals of the program?  
applications course

D. How does this course affect degree requirements?

elective

E. What are the calendar changes necessary to reflect the addition of this course?

New course.

F. What course, if any, is being dropped from the calendar if this course is approved?

None.

G. What is the nature of student demand for this course?

Unknown.

H. Other reasons for introducing the course.

New program.

3.

4. BUDGETARY AND SPACE FACTORS

A. Which faculty will be available to teach this course?

No special faculty requirement, but all faculty may be asked to participate from time to time.

B. What are the special space and/or equipment requirements for this course?

Access to card punches or consoles.

C. Any other budgetary implications of mounting this course:

Computing time. Some supplies. Some honorarium monies for guest lecturers.

Approval:

Dean of Division:

Senate: