

## MEMORANDUM

Mr. H. M. Evans	From. B. L. Funt
Secretary of Senate	Dean of Science
Subject Program Priorities	Date February 19, 1969

At its meeting of February 17th, 1969, the Faculty of Science considered the recommendations on program priorities and agreed that these would be:

1. Computing Science
2. Biochemistry

In addition, strong support was expressed for the proposal for a summer program for teachers, but this proposal, which was before the Faculty, was not considered in sufficiently definitive form to be brought forward at this time.

It is essential that I make it clear to Senate that the description of course content in the programs is not final, but has been completed sufficiently to present a general perspective of the programs and their content sufficient to establish their priority positions.

If the programs are approved and further competent faculty members obtained, variation in general content of individual courses may be brought forward.

None of the courses recommended for the new programs in Computing Science and Biochemistry have been considered in detail by the Undergraduate Curriculum Committee of the Faculty of Science, and it is not intended to present such courses for individual detailed approval until approval for the program as a whole has been obtained.

On the other hand, the programs and their general delineation have been considered in detail by the Faculty and by appropriate committees of Faculty, and have been examined and debated extensively.

BLF/cj  
Enclosure

*B. L. Funt*

# SIMON FRASER UNIVERSITY

S 2290

## MEMORANDUM

To.....	From B. L. Funt,.....
Faculty of Science.....	Dean of Science.....
Subject Proposal for a Program in Computing Science.....	Date February 6, 1969.....

Computers and computer techniques are having profound impact on modern society. They have revolutionized the approach to a wide variety of disciplines; they have a profound sociological, economic and scientific implication. No branch of science and technology can be predicted to have a quicker growth rate or greater impact or a greater potential for the next decade.

These observations are <sup>not</sup> particularly novel. They are widely recognized by the community; they are widely appreciated by potential students. There is therefore a great demand for courses and programs in Computing Science.

There is a correspondingly rapid development in the sophistication of computer techniques and in the development of computing science as an established discipline with many broad ramifications, including such diverse topics as integrated information systems and artificial intelligence.

In terms of selecting a program for which there is a broad need within the university community and appreciation in external society and a real demand from students, computing science is probably the best choice and the most highly favoured selection.

Some courses in computing science are presently taught in the Department of Mathematics. The Department prepared a proposal for an expanded computing science program and this was discussed at Faculty and various recommendations regarding the structuring of the administrative portion of the program and the management of the Computer Centre were made and are in the process of implementation.

The Computing Science program in its academic form as prepared by the Department of Mathematics is based on the core program widely employed in both Canadian and American universities. There is little doubt that it will be essentially correct in its ramification. There is little doubt also that the senior academic appointment in Computing Science will provide leadership and professional competence and that the academic personnel in the computing group will polish the program in terms of academic refinement and actual course structure.

However, although the fine details of the academic program cannot and should not be specified at this time, the broad implications in terms of budgetary need, program priorities, and curriculum development must be viewed now.

SIMON FRASER UNIVERSITY

MEMORANDUM

S 2296

Members of the Faculty of Science

From B. L. Funt

Dean of Science

Subject Biochemistry Program

Date February 14, 1969

An inspection of the Biochemistry Program shows a maximum of four faculty members being added during the next two years. The analysis has been based on general average figures of operating expenses and salary expenses in the Departments of Biological Sciences and Chemistry. It is difficult to determine exactly the needs, as part of the overhead costs do not increase proportionately to faculty, but there would be some special equipment cost in initiating new laboratories. I have accordingly taken the ratio which corresponds to current figures in Biological Sciences and Chemistry. On this basis, the following analysis is probably indicative.

Salaries: Four faculty members, \$55,000

Operating Expense: \$90,000

Total: \$145,000 annual rate

The projected budget requirement for the next three years will probably be as follows:

<u>Year</u>	<u>Annual Rate</u>	<u>Budget Year Commitment</u>
1969-70	\$55,000	\$40,000
1970-71	\$145,000	\$100,000
1971-72	\$160,000	\$160,000

The adjustment on the 1971-72 estimates is based upon probable increases in salary commitments for the same category of academic and supporting members of staff.

BLF/cj

Proposal for the Development of the  
Biochemistry Programme

At the January 27 meeting of the Biochemistry Committee the undergraduate Biochemistry Programme was discussed. The conclusions were as follows:

The Programme fulfills a demand that arises from two principal sources;

(1) Recent advances in Biochemistry have received wide publicity and have resulted in Nobel Prizes for several Biochemists. This has stimulated many young people to study Biochemistry. Moreover, the subject is now sufficiently developed to appeal to those who demand the scientific rigor formerly associated with pure chemistry and physics.

(2) The Biochemistry Programme is used by many students as a prelude to studies in medicine and related disciplines.

However, there are further impending demands that must be considered. Research in life sciences, for example the study of the metabolism of narcotic drugs and the possibility of synthesis of new biologically active compounds, and the resolution of problems of atmospheric pollution which are in fact biological-chemical problems, demand to a greater

extent than ever, well trained Biochemists.

Besides catering to a demand, the Biochemistry Programme must help graduands fulfill their chosen role in society.

The Committee visualized four main roles for graduands.

They may:

(1) Proceed to further studies and a career in Biochemical research.

(2) Study medicine and related fields.

(3) Study educational techniques and teach.

(4) Become skilled technicians for employment in various biological and chemical establishments.

The present Biochemistry Programme was reviewed in the light of the above factors. It consists of a core programme of 89 prescribed hours: 32 hrs. in Biology, 39 hrs. in Chemistry, 12 hrs. in Mathematics, and 6 hrs. in Physics; plus 31 hrs. of electives, seven of which must be in Science.

The Committee agreed that, as 75% of the programme is presently prescribed, alterations to the programme should not increase the prescription. The alterations should, if possible, provide more variety and allow the student more choice. With these principles accepted there are two means of altering the programme; (1) substitution of a new course for a prescribed one, or (2) no longer requiring

one or more courses of the core programme.

The present core programme is made up of selected courses from the Biology and Chemistry Programmes. Few, if any, courses have been designed specifically for the Biochemist. The Committee strongly feels that the present demand for the programme merits consideration of amendment of this policy.

Changes presently contemplated would require two new courses to be given by the Biology Department. One of these at the 200 level would combine parts of Biology 201 (Cell Biology and Biochemistry), 202 (Genetics), and 203 (Developmental Biology); the second at the 300 level would contain parts of Biology 201 (Cell Biology and Biochemistry), 402 (Physiological Genetics), and 406 (Microbiology).

Similarly in Chemistry the requirement for Chem 231 (Inorganic Chemistry) would be eliminated; Chem 252 (Organic Chemistry II) would be replaced by a new course dealing with the organic chemistry of molecules of biological interest (Chem 20X); and Chem 356 (Organic Chemistry Laboratory II) would be replaced by a Chem XXX (Laboratory).

At present two courses in Biochemistry are being offered: Biology 301 and Chemistry 421. The Committee proposes that Biochemistry students be required to take

Biol. 301, which deals largely with pathways of intermediary metabolism. Intermediary Metabolism could than be dropped from Chem 421 and more emphasis placed on the mechanisms of enzyme action as indicated by recent elucidation of enzyme structure.

Finally, the requirement for Chem 261 (Physical Chemistry I) would be eliminated and Chem 422 (Physical Biochemistry) amended to fill the necessary background.

The revised core programme would be:

- |            |       |  |                      |
|------------|-------|--|----------------------|
| Bioscience | 101-4 | Introduction to Biology                |                      |
|            | 102-4 | Introduction to Biology                |                      |
|            | 20X-3 | A new course.                          |                      |
|            | 301-3 | Biochemistry                           |                      |
|            | 302-3 | A new course.                          |                      |
|            | 305-3 | Animal Physiology                      |                      |
|            | 315-3 | Plant Physiology                       |                      |
|            | 401-3 | Chemistry                              |                      |
|            | 428-3 | Experimental Techniques                | <u>Total 29 hrs.</u> |
| Chemistry  | 102-3 | General Chemistry II                   |                      |
|            | 103-3 | Bonding, Structure and Stereochemistry |                      |
|            | 116-2 | General Chemistry Laboratory           |                      |
|            | 117-2 | Quantitative Chemistry Laboratory      |                      |
|            | 251-3 | Organic Chemistry I                    |                      |

Chemistry (cont'd)

- 256-2 Organic Chemistry Laboratory I
- 20X-3 Organic Chemistry of Biological Molecules
- 421-3 Altered course.
- 422-3 Physical Biochemistry
- 426-2 Biochemistry Laboratory I
- 427-2 Biochemistry Laboratory II
- 457-3 Modern Laboratory Techniques in Organic

Chemistry

Total 31 hrs.

Mathematics

9 hrs.\*

- Physics 100-3 or 101-3 General Physics I
- 102-3 General Physics II

Total 6 hrs.

Total 75 hrs.

\*Elimination of Chem 261 will reduce Math requirement.

The proposed core programme would allow 45 hrs. of electives. The Committee will suggest new courses to give Biochemistry students, as well as others, an opportunity to diversify their interests. Presently one suggestion has been made; a course in Biopolymers (Dean Funt?).

Introduction of the core programme would require little additional expense. Probably the changes could be made with



one or at the most two new faculty members in each of the Biology and Chemistry Departments.

However, the ultimate success of the programme depends upon an expansion of present facilities in several ways:

- (1) provision of modern research equipment.
- (2) provision of adequate space and equipment for research and teaching
- (3) recruitment of specialists to faculty.

These requirements are interrelated. The University presently lacks several pieces of major equipment basic to modern biochemical research such as an analytical ultracentrifuge, an amino acid analyzer, or a counter current distribution apparatus. Without such equipment and without adequate space for research and teaching, it will be difficult, if not impossible, to attract to the faculty people presently active in Biochemical Research. And only by attracting men of repute and men with potential can the University establish its reputation in the field of Biochemistry. It will therefore be advisable to allocate some areas in Phase 3 for a nucleus of biochemical research and to budget for additional staff and equipment for this purpose. Phase 4 of the building plans should then provide for further extension of this nucleus.