Wednesday, February 16, 1983.

The Sixth regular meeting of the Senate of The University of British Columbia for the Session 1982–83 was held on Wednesday, February 16, 1983 at 8:00 p.m. in the Board and Senate Room.

Present: President D. T. Kenny (Chairman), Chancellor J. V. Clyne, Dr. R. A. Adams, Dean D. R. Birch, Mr. W. H. Birmingham, Mrs. M. F. Bishop, Dr. T. H. Brown, Rev. P. C. Burns, Dean P. T. Burns, Mr. G. D. Burnyeat, Dr. K. O. L. Burridge, Mr. F. Cabanas, Dr. J. J. R. Campbell, Dr. D. J. Connor, Dr. J. Dahlie, Mr. M. S. Dedels, Dr. J. D. Dennison, Mrs. S. Dodson, Dr. D. Donaldson, Dr. A. J. Elder, Dean C. V. Finnegan, Mr. H. J. Franklin, Mrs. E. D. Fulton, Miss L. M. Hebert, Dr. A. M. Hickling, Dr. H. E. Hirsch, Miss S. J. Holmes, Mrs. P. Jones, Dr. W. M. Keenlyside, Dr. R. F. Kelly, Dr. A. Kozak, Dr. L. M. Lavkulich, Dean P. A. Lusztig, Mrs. A. Macdonald, Mr. T. Mah, Dr. J. P. Martin, Mr. M. A. McCann, Ms. D. N. McDonnell, Mr. D. McInnes, Mr. J. F. McWilliams, Mr. I. C. Miller, Mr. T. K. P. Ngai, Ms. A. H. Rahme, Dr. J. F. Richards, Dr. M. Shaw, Mr. G. M. Shepard, Dr. C. E. Slonecker, Dr. R. H. T. Smith, Mr. L. P. Smyth, Dr. R. A. Spencer, Dr. R. Stewart, Dr. P. Suedfeld, Mr. R. J. Summerbell, Dr. P. R. Tennant, Miss C. L. V. Warren, Dean W. A. Webber, Dean L. M. Wedepohl, Mr. V. G. Wellburn, Dean R. M. Will, Dr. D. LL. Williams, Dr. M. D. Willman, Dr. J. L. Wisenthal.

Observer: Mr. J. A. Banham

Messages of regret for their inability to attend were received from Dr. C. E. Armerding, Dean G. S. Beagrie, Dr. G. D. Bellward, Dr. D. J. Campbell, Dr. T. S. Cook, Mr. D. B. Fields, Dean J. A. F. Gardner, Dr. R. W. Kennedy, Dean W. D. Kitts, Mr. J. Kulich, Dean P. A. Larkin, Dr. D. S. Lirenman, Dr. D. Lupini, Ms. C. E. McAndrew, Dr. A. J. McClean, Ms. S. M. Provost, Dean B. E. Riedel, Miss R. E. Robinson, Dr. G. G. E. Scudder, Mr. A. Varma.

Minutes of previous meeting

Dr. Richards )
Rev. Burns )

That the minutes of the Fifth regular meeting of Senate for the Session 1982–83, having been circulated, be taken as read and adopted.

It was noted that on page 7943 of the minutes PHARM 549 should read PHARM 521.

The motion was put and carried.

## Senate membership

### Declaration of vacancy

As required under section 35 (6) of the University Act, the following vacancy was declared:

Mr. K. D. Freeman - student representative of the Faculty of Graduate Studies

### New Senator

Mrs. Penny Jones - student representative of the Faculty of Graduate Studies replacing Mr. Freeman

## Business arising from the Minutes

### Status of account receivable - Health Sciences Centre Hospital Society (P.7914)

As requested at the January meeting, the President gave a further report on the status of the amount of $1.27 million owing from the U.B.C. Health Sciences Centre Hospital. The President stated that he had been informed that a cheque for the amount owing, plus interest, would be forwarded to the University before the end of the month. He agreed to report further on this item at the next meeting.

### Noon-hour Lectures (P.7928)

The Registrar had been requested to submit a report to Senate concerning the number of lectures scheduled at 12:30 p.m. on Mondays, Tuesdays, Wednesdays and Fridays. In response to the request the following report had been circulated:

"At its meeting of April 21, 1982 Senate adopted the following statement:

> Senate, recognizing that special noon-hour events are a vital part of the intellectual and cultural life of the University community, request the Registrar to ensure that as few classes as possible are scheduled at 12:30 p.m. on Monday, Tuesday, Wednesday and Friday, and reaffirms the existing policy that no classes be held on Thursday between 12:30 and 2:30 p.m.

The lecture schedules for 1981/82 and 1982/83 made regular use of the 12:30 p.m. lecture period, except for Thursdays, and resulted in the following:

| | Scheduled Lectures | % change from original schedule | Number of Registrations |
|---|---|---|---|
| 1981/82 | 266 | 15% | 6,995 |
| 1982/83 | 364 | 14% | 10,021 |

Business arising from the Minutes

Noon-hour lectures (continued)

"The construction of the 1982/83 lecture schedule was virtually completed at the time Senate adopted the statement. At present the 1983/84 Schedule is being prepared and departmental timetable representatives have been advised of Senate's statement."

In reply to a query the Registrar confirmed that timetable representatives will be consulted before any changes from the original schedule are made when this involves the use of the noon-hour periods.

From the Board of Governors

Notification of approval in principle of Senate recommendations - subject, where applicable, to the proviso that none of the programs be implemented without formal reference to the President and the formal agreement of the President; and that the Deans and Heads concerned with new programs be asked to indicate the space requirements, if any, of such new programs.

(i) Co-operative Education program, new courses, course and program changes recommended by the Faculty of Agricultural Sciences

(ii) New courses, program and course changes recommended by the Faculty of Applied Science

(iii) Changes to the B.Arch program, new courses and course changes recommended by the School of Architecture

(iv) New courses, course and program changes recommended by the Faculty of Arts

(v) Changes to the option requirements of First Year Commerce recommended by the Faculty of Commerce and Business Administration

(vi) New courses, course and program changes recommended by the Faculty of Education

(vii) New courses and course changes recommended by the Faculty of Graduate Studies

(viii) Ph.D. Program in Social Foundations of Educational Policy recommended by the Faculty of Graduate Studies

(ix) Ph.D. Program in Audiology and Speech Sciences recommended by the Faculty of Graduate Studies

(x) Course change recommended by the Faculty of Law

(xi) New course recommended by the School of Nursing

(xii) Course change recommended by the Faculty of Pharmaceutical Sciences

(xiii) New courses and course change recommended by the School of Physical Education and Recreation

From the Board of Governors (continued)

(xiv) Specialization in Dance within the B.P.E. program recommended by the School of Physical Education and Recreation

(xv) New courses and course changes recommended by the Faculty of Science, with the exception of those proposals connected with the Four-Year Engineering Program

(xvi) New program in Atmospheric Science and a Diploma Program in Meteorology recommend by the Faculty of Science

Prizes, Scholarships and Bursaries

Mr. McWilliams )
Miss Warren ) That the new awards (listed in Appendix 'A') be accepted subject to the approval of the Board of Governors and that letters of thanks be sent to the donors.

Carried

Presidential Advisory Committee for the selection of a Vice-President Academic

Senate was informed that a Presidential Advisory Committee for the selection of a Vice-President Academic was to be established.

In February 1975, the Board of Governors and the Senate agreed to the following terms of reference and composition in establishing a committee for the recommendation and selection of candidates for the position of Vice-President:

Terms of reference

1. To consider candidates for a Vice-Presidential (Senior Academic Administrator) position.
2. To advise the President on the choice of a Vice-President (Senior Academic Administrator) in order that he may make an appropriate recommendation to the Board of Governors.

Membership

To be composed as follows:

Chairman - President-designate
Secretary - To be chosen by the committee from its members
Members - Three members of the Board of Governors, appointed by the President in consultation with the President-designate
Three members of Senate, elected by Senate

In 1975, Senate agreed that the Nominating Committee be instructed to nominate three members of Senate to serve on the advisory committee.

The Agenda Committee therefore recommend that the Nominating Committee be instructed to nominate three members of Senate to serve on the Presidential Advisory Committee.

Dean Webber )
Dean Finnegan ) That the Senate Nominating Committee be instructed to nominate three members of Senate to serve on the Presidential Advisory Committee for the selection of a Vice-President Academic.

Carried

Reports of Committees of Senate

Nominating Committee

Dr. Richards explained that the committee had met in anticipation of the approval of the recommendation of the Senate Agenda Committee and had nominated the following members of Senate to serve on the Presidential Advisory Committee for the selection of a Vice-President Academic:

Mr. M. A. McCann (Third Year Medicine Student)
Dr. A. J. McClean (Faculty of Law)
Dr. D. LL. Williams (Department of Physics)

Dr. Richards )
Dr. Dennison ) That the recommendations of the Nominating Committee be approved.

Carried

Vacancies on Senate Committees

The committee nominated the following persons to fill vacancies on Senate committees:

Budget Committee

Ms. A. H. Rahme - replacing Mr. Freeman

Library Committee

Mrs. Penny Jones - replacing Mr. Freeman

Dr. Richards )
Miss Warren ) That the recommendations of the Nominating Committee be approved.

Carried

Curriculum Committee (see Appendix 'B')

Faculty of Applied Science - Four-Year Engineering Program and revised Five-Year Engineering Physics Program

Dr. Richards )
Dean Wedepohl ) That Senate approve the proposal of the Faculty of Applied Science to offer a Four-Year Engineering Program and a revised Five-Year Engineering Physics Program, together with proposals for new courses and course changes submitted by the Faculty of Science in connection with the Four-Year Engineering Program.

Reports of Committees of Senate

Curriculum Committee

Faculty of Applied Science - Four-Year Engineering Program and revised Five-Year Engineering Physics Program (continued)

Dr. Richards reported that as requested by Senate at the previous meeting the committee had considered the modifications circulated at that meeting and had subsequently agreed to recommend approval of the proposals from the Faculty of Applied Science. He stated that the recommendation was predicated on the understanding that only those students who are very well prepared in Grade 11 and 12 Mathematics, Chemistry, English and Physics will be admitted directly from Grade 12 to the new programs. The committee still felt that the first year of the new Four-Year Program was very demanding and suitable for only those who had very good academic preparation in the subjects mentioned.

The committee endorsed the provision of two other routes to the B.A.Sc. degree, firstly the admission to First-Year Engineering following First-Year Science or its equivalent. This route might be selected by students either because they wish to avail themselves of a broader range of electives over the course of five years or because they do not meet the entrance requirements for direct admission to the Four-Year Program. The committee was particularly supportive of the availability of this route because it continued to have some concerns that in the process of condensing the five year program to four years there had been a significant loss of breadth and flexibility and Science foundation. It was noted that the revision to the sequencing of courses and the substitution of Physics 156 for Physics 150 for such transfer students had substantially reduced the committee's earlier concerns about accommodating students with differing academic preparation. The second route endorsed by the committee was the transfer of students from First-Year Science directly into Second-Year Engineering programs provided that the student was able to make up deficiencies that would exist following the normal First-Year Science program. The committee also endorsed the preliminary steps taken by the Faculty of Applied Science to try to make the necessary courses available to students during the summer either at a college or perhaps at U.B.C.

The committee also noted that whilst it recognized the importance of specialization in programs for engineering students it was still somewhat surprised by the very small number of common core courses required of students going through the engineering program.

Reports of Committees of Senate

Curriculum Committee

Faculty of Applied Science - Four-Year Engineering Program and revised Five-Year Engineering Physics Program (continued)

In conclusion, Dr. Richards stated that the committee had received assurances from the Faculty of Applied Science that the new programs would be carefully monitored and that they would be prepared to keep Senate informed of the progress and any problems that might develop.

In the discussion that followed opinions for and against the proposals were expressed. Chancellor Clyne stated that although he appreciated that the Four-Year Program was open to only the most bright students he felt that the University was doing them a disservice in view of the changes taking place in today's society. Because of these changes students would undoubtedly require a greater breadth of education whereas the proposals before Senate would reduce such breadth.

Speaking in support of the proposal, Dr. Spencer stated that it would be wrong to characterize the Four-Year Program as a narrow program considering that 31 units or 38% of the course work in the proposed program would be taken outside the Faculty of Applied Science. At the same time, including English 100, a minimum of 10½ units in the humanities or social sciences would be required. As far as the quality of the program was concerned, he felt that this would depend primarily on the quality of the students entering the program and the quality of the faculty teaching it. He stated that one of the reasons for supporting the proposal was that, in his opinion, when you compared the knowledge of engineering students graduating with a Bachelor's degree to the knowledge of many Master's students it was a great disservice to require engineering students to spend five years on a Bachelor's degree. He felt that students, the educational system and society in general would be better served if students received a Bachelor's degree after four years and those students wishing to specialize in some branch of engineering were able to spend their fifth year getting a Master's degree. These students would have two advantages over students leaving the present program: firstly, they would have an added qualification and secondly, because of the restructuring of the program and an additional year or year and a half in a Master's program they would be better educated than students graduating from the present five-year undergraduate program.

In reply to a query, Dean Wedepohl assured Senate that initially only those secondary school graduates with high standing in Mathematics, Physics and Chemistry would be admitted to the program and that it was the intention of the Faculty of Applied Science to carefully monitor their progress.

Reports of Committees of Senate

Curriculum Committee

Faculty of Applied Science - Four-Year Engineering Program and revised Five-Year Engineering Physics Program (continued)

In reply to a further query the Registrar stated that it was his understanding that approximately 80% of university-bound students in the Province of Ontario complete the 13th grade in 12 years and from recent announcements it was his understanding that in the near future high school graduation in Ontario would be at the completion of Grade 12.

Vice-President Shaw spoke in favour of the proposal and reminded Senate that the Senate Curriculum Committee had addressed the concerns previously expressed. He further stated that the proposal had gone through the academic process and that it would be a disservice to students to make a decision that would deny the opportunity to complete the degree program in a shorter period of time.

After further discussion the motion was put and carried.

Admissions Committee

Faculty of Applied Science - proposed Calendar statement and admission requirements for Engineering programs

Dr. Smith reported that the Admissions Committee had considered the proposals of the Faculty of Applied Science for admission to the Faculty and after making revisions to the original proposals, recommended approval of the following Calendar statement and admission requirements:

"The Faculty offers programs of undergraduate study leading to the Bachelor of Applied Science (B.A.Sc.) degree in the following areas of engineering:

1. Bio-Resource Engineering
2. Chemical Engineering
3. Civil Engineering
4. Electrical Engineering
5. Geological Engineering
6. Mechanical Engineering
7. Metallurgical Engineering
8. Mining and Mineral Process Engineering
9. Engineering Physics

The Faculty of Applied Science will be admitting suitably qualified applicants directly from secondary school into First Year Engineering. These students will normally complete the B.A.Sc. degree in four years, except in the case of Engineering Physics which requires five years. Programs satisfying the requirements of the B.A.Sc. in the other engineering disciplines over a five year period will continue to be available. Students may choose this route, which consists of First Year Science followed by four years of Engineering, either because they wish to avail themselves of a broader range of electives or because they do not meet the higher entrance requirements of the four year programs.

Reports of Committees of Senate

Admissions Committee

Faculty of Applied Science - proposed Calendar statement and admission requirements for Engineering programs (continued)

*"Entrance standards require that the student must have completed, with high standing, courses in mathematics and the sciences. Practical work outside the University, scheduled field trips, and the activities of professional and technical societies all contribute to the rounding out of the undergraduate programs and students are expected to participate in them as fully as circumstances permit.

Extension of engineering studies at the post-graduate level is becoming increasingly important. The Faculty offers post-graduate courses and provides research facilities in many areas of engineering for students proceeding to the degree of Master of Applied Science, Master of Engineering or Doctor of Philosophy.

The requirements for entrance to these programs are set out fully in the Faculty of Graduate Studies section of the Calendar. In general it may be stated that acceptance as a candidate for a Master's Degree requires a high level of accomplishment in the undergraduate course. For the M.A.Sc. degree a substantial program of academic courses and research, occupying at least twelve months, is required. For the M.Eng. degree, additional academic courses are required in lieu of a thesis. Acceptance as a candidate for the Ph.D. degree requires demonstrated academic and research ability; the program of studies and research occupies at least two years' resident study beyond the level of the Master's degree. For these degrees competence in at least one additional language besides English may be required.

Part-Time Study

The Faculty will consider proposals from qualified applicants for part-time study towards the degree of B.A.Sc. Since the flexibility for such study may be limited in some cases, approval must be obtained from the Office of the Dean.

The M.Eng. degree may be obtained by part-time study in all departments. Part-time study towards the M.A.Sc. degree is permitted in some departments.*

*Denotes material in 1982/83 Calendar

Admission

Due to limited resources, the Faculty has been authorized by Senate to restrict enrolment in First Year Engineering, and within specific engineering disciplines at the Second Year level. Attainment of the minimum academic requirements listed below means that the applicant is eligible for selection, but does not provide assurance of admission. The selection is made on the basis of academic merit on the standing in the subjects required.

Mature student applicants who do not meet the normal University or Faculty requirements for admission, but who have relevant work experience in engineering, may be considered for admission on the written recommendation of a registered Professional Engineer who is familiar with the applicant's work. Admission under this provision must be submitted to the Dean's Office for approval.

Applications must be made by May 31.

Reports of Committees of Senate

Admissions Committee

Faculty of Applied Science - proposed Calendar statement and admission requirements for Engineering programs (continued)

Applicants from Grade 12 B.C. Secondary Schools to First Year Engineering

"Applicants for admission must satisfy the general university admission requirements and must have completed Algebra, Physics and Chemistry at the Grade 12 level. Where possible, applicants are advised to complete Geometry 12 and Enriched Algebra 12 (in place of Algebra 12). Applicants from schools where either Physics 12 or Chemistry 12 cannot be completed may petition the Faculty of Applied Science Admissions Committee which may make a recommendation to the Senate Admissions Committee to be excused this deficiency. In such cases, another course at the Grade 12 level will be substituted in the calculation of standing. Program adjustments will be necessary for students admitted under this provision.

In choosing qualified applicants for entry into First Year Engineering students will be selected on the basis of their standing in Grades 11 and 12 courses in Algebra, Chemistry, English and Physics.

Applicants from Universities and Colleges

Applicants from First Year Science at The University of British Columbia or an approved university or college should have completed the following prerequisite subjects:

English 100 (Literature and Composition)
Mathematics 100 and 101 (or 120 and 121)
Chemistry 110 or 120
Physics - one of 110, 115 or 120
Elective

(Remainder of Calendar statement is unchanged except for minor housekeeping changes such as deletion of section entitled "Four Year Program", titles (but not sections) "English Requirement" and "English Composition Requirement", modification of first sentence under "Humanities Elective Courses" to 'Humanities Elective courses should be selected from courses given in the Faculty of Arts. . .', and modification of last sentence under "Student Classification to 'A Student who is taking courses from more than one year level shall normally be given year status. . .')"

Dr. Smith )
Dr. Dahlie ) That the Calendar statement and admission requirements for Engineering programs be approved.

Carried

Reports of Committees of Senate (continued)

Ad hoc Committee on Breadth

The following majority and minority reports had been circulated:

Majority Report

"At its meeting in September, 1982, the Senate passed the following motion:

> "That Senate strike an ad hoc committee to enquire into and draw up recommendations as to minimum breadth requirements in the pre-baccalaureate programs of the University and report to Senate thereon."

The ad hoc committee started from the assumption that all undergraduate programs should require a reasonable breadth of study as well as specialization in a chosen field. Our objective was to outline some reasonable breadth requirements, and to suggest how they might be implemented.

In the committee's view, "reasonable breadth" requires study in the humanities and arts, the social sciences, and science and technology. A majority of the committee feel that all students should be required to take courses in each of these areas. These courses should include at least one that covers some aspect of a foreign culture, and one that has a historical orientation. In addition, we feel that every student should be free to choose at least one or two elective courses with no constraint other than necessary prerequisites. This would allow students to further broaden their education.

The case for breadth of study in undergraduate programs has been made in previous reports at this university and others, and we do not intend to repeat the arguments for it here. We will only comment that in our opinion no single disciplinary area or faculty can offer the required breadth of study on its own. All undergraduate students should be taking a significant number of courses outside their own faculty.

Recommendation 1:

"That Senate approve the principle that all students should receive a broad exposure to a variety of disciplines in addition to a specialized education in their chosen field of study before completing any baccalaureate degree."

The committee believes that the broad education received by all undergraduate students should include courses that introduce them to aspects of science and technology, as well as courses in the liberal arts. As a minimum, students should learn something about at least one of the natural sciences, and should have some familiarity with the analytical methods used in mathematics or computer science. We feel that science and technology form such an integral and important part of our culture that students in all disciplines should spend some time learning and studying in this area.

We also believe that all students should take courses in the social sciences and in the arts and humanities. Study in these areas should introduce students to disciplines which deal with behaviour and human interaction, and to our culture as it is expressed in language, literature and the arts.

Reports of Committees of Senate (continued)

Ad hoc Committee on Breadth

Majority Report (continued)

"There are two further requirements that can be met without requiring additional courses. We suggest that when students select the courses that satisfy the overall breadth requirement they should have to include at least one that deals with some aspect of a foreign culture, and one that has a historical orientation. (A single course could satisfy both of these requirements.) The committee feels that an introductory course in a foreign language should not be considered to satisfy the requirement for a course that deals with a foreign culture.

The committee also considered the possibility of including a further requirement of at least one course which would have as its primary emphasis social, philosophical and moral analysis. This requirement could be satisfied in the same manner as the foreign culture and historical orientation requirements. It was felt that students would benefit from the examination of concepts such as justice, equity, social responsibility and situational ethics in both a general and a discipline-specific context. However desirable this may appear to be, it was found that such a requirement is not feasible at this time, because there are currently only a handful of courses which would meet this objective. It is our hope that this situation may change at some point in the future and we would urge Senate to reconsider this proposal if that occurs.

A majority of the committee believes that to ensure the desired breadth of study all students should be required to take courses selected from a list approved by Senate. There would have to be provision in every pre-baccalaureate program for students to take the required number of approved courses. These could be taken either as courses required in the program, or as electives chosen by the student. Some programs might offer a reduced number of electives selected from the larger number approved by Senate.

There are already some requirements in each faculty that are similar to some of those proposed here, and every program requires some specific courses and/or electives that would satisfy some of our proposed requirements. While no existing program has all the requirements that are proposed here, many do permit enough flexibility in the choice of electives to allow students to choose courses that would satisfy the proposed requirements. It would not be necessary to change a program in those areas where it already meets the breadth requirements, or where it allows them to be met through the choice of electives.

We would expect that most, if not all, the courses approved by Senate would be drawn from normal departmental offerings. Some new courses might be introduced primarily to meet the objectives of the proposed breadth requirements, but this is not necessary. We considered and rejected the idea of requiring all students to take special "core" courses developed specifically to satisfy the requirement for breadth. This would be difficult or perhaps impossible to implement, and in our view would not necessarily offer any advantage over the proposed arrangement.

Reports of Committees of Senate

Ad hoc Committee on Breadth

Majority Report (continued)

"We also considered setting general objectives for a broad education and placing the onus on students to choose courses that meet these. A majority of the committee feel that this system would be unworkable, and would lead in a relatively short time to a situation where many students were choosing courses for other reasons than meeting the stated objectives. There are obvious attractions in allowing students complete freedom to choose at least some courses in their programs, but we feel that some constraints are necessary to ensure that every student receives a broad education. We do however propose that there should be at least a minimum number of "free" electives in every program.

Our proposed requirements for breadth of study are set out below in the form of a draft Calendar statement.

Recommendation 2:

"That Senate adopt the following statement to define the requirement for breadth in pre-baccalaureate programs, and that this or a similar statement become effective for students beginning a program in September 1984 or subsequently, and that all Departments and Faculties shall make the necessary revisions to their programs by that date.

Proposed Calendar Statement

Breadth of Study in Pre-Baccalaureate Programs

In addition to any other degree or program requirement, all students must complete 15 units in courses that satisfy the University requirement for breadth of study before completing any baccalaureate degree.

This requirement is as follows:

i) 3 units in courses in each of the following categories I, II, and III, and 6 units of courses in category IV:

I Mathematical Studies and Analysis;
II Physical and Biological Sciences;
III Social and Behavioural Sciences;
IV Humanities and the Arts.

Courses must be selected from those listed below. No course can be used to meet the requirements of more than one category.

ii) At least 3 units of courses in category IV must be from list IV A – Language, Literature and the Arts.

iii) The courses selected must include:

a) at least one course that deals with a foreign culture that is significantly different from that of Canada, and is designated (a);

b) at least one course that has a historical orientation, and is designated (b)."

This Calendar statement would be followed by lists of acceptable courses, designated (a) and/or (b) where appropriate.

Report of Committees of Senate

Ad hoc Committee on Breadth

Majority Report (continued)

"We would expect that the listed courses would include many of those offered in the Faculties of Arts and Science as well as some others in Applied Science, Commerce and Business Administration, Education, Forestry, the School of Home Economics and possibly others. Each department should be asked to recommend to the Curriculum Committee those courses which they believe should be listed in each category, and to indicate which courses, if any, deal with a foreign culture or have a historical orientation. The Curriculum Committee should prepare lists of suitable courses in each category bearing in mind the objective of ensuring a broad education through study in the areas discussed above.

Some additional criteria that the listed courses should meet are as follows:

1) They should generally be open to students outside the department or faculty offering them.

2) Courses should preferably be offered by the department or faculty that is primarily concerned with the subject matter being taught.

3) Where courses offered by a faculty are specifically for students in another faculty (eg.: Math courses for engineers) these courses should provide a reasonably broad coverage of the discipline area. They should not be specialized courses developed to meet narrow objectives.

4) Courses in foreign languages should only be listed if students taking them will be required to do so at a level that is appropriate given their background in the language.

5) Courses emphasizing the development of specific skills or techniques, such as those in music performance or sports skills, are not appropriate and should not be included.

6) Introductory courses in a foreign language should not be considered to satisfy the requirement for a course that deals with a foreign culture.

No doubt the Curriculum Committee will add to these criteria and improve them on the basis of their experience. We suggest that they should explain the criteria they have used when they bring courses to Senate for approval.

Some courses might be listed under more than one category (eg.: PHIL 115/HIST 115, "Introduction to the History and Philosophy of Science", would appear to be appropriate for inclusion in category II – Physical and Biological Sciences and category IV – Humanities. It would also meet the requirement for a course that has a historical orientation, and would be designated "b").

The committee considers that English 100 is a basic required course which is not primarily intended to contribute to breadth. We would therefore suggest that English 100 should not be used to satisfy the requirements for breadth of study.

To allow the feasibility of the proposed requirement to be evaluated, we prepared draft lists of courses for each of the proposed categories. There appears to be an adequate number of suitable courses in each category.

Reports of Committees of Senate

Ad hoc Committee on Breadth

Majority Report (continued)

"We suggest that Senate should ask the Curriculum Committee to prepare lists of appropriate courses to satisfy the breadth requirement.

Recommendation 3:

"The Senate Curriculum Committee should recommend lists of courses that satisfy the breadth requirements in each category, for adoption by Senate."

In addition to being required to take certain courses, we believe that all students should be free to study in some area of their choice outside their area of specialization. We therefore propose that a minimum of three units of free electives be allowed in every pre-baccalaureate program. This would give those students who wish to do so the opportunity of studying in one or two additional discipline areas chosen from among the many that make up the extremely varied offerings at UBC. We feel that the majority of students would use this small measure of freedom wisely to enlarge their knowledge and experience during their years at UBC.

Recommendation 4:

"Every pre-baccalaureate program should allow a minimum of three units of free electives."

Minority Report

While agreeing with my colleagues on the committee that an undergraduate education should not be narrowed or overspecialized, I differ with them with regard to the best manner of dealing with the matter. Essentially, we differ with regard to the restrictions to be placed on courses taken outside the specialty.

It is generally recognized that the humanities and basic sciences constitute the core of the university and most would agree that all students' programs should include courses in these areas. The first recommendation below is intended to meet this condition without placing too great a restriction on a student's choice of electives. When combined with Recommendation 2 it would allow, for example, a student in, say, Biochemistry, Mechanical Engineering, or Forestry who had developed an interest in one of the humanities to take as electives a concentration of courses in the particular area of interest, a minor effectively. (Partly to simplify the application of this principle humanities courses are deemed to be those courses offered by departments in the Faculty of Arts). It would further require that at least one course be taken in mathematics or a physical or biological science, a requirement that most, but not all, baccalaureate programs now have.

Reports of Committees of Senate

Ad hoc Committee on Breadth

Minority Report (continued)

"The second recommendation below is meant to provide students with further opportunities for choice by ensuring that Departments do not have degree requirements that are overloaded with courses in their own areas of interest. It is recognized that a system that gives a completely unfettered choice of electives can lead to students selecting courses for reasons of expediency and individual Faculties might wish to consider designating courses of a certain kind as not being acceptable electives in this category.

The third recommendation, below, is intended to place some responsibility on Faculties and Departments for initiating breadth and related requirements. It is recognized that Recommendations 1 and 2 would have the least effect on the Faculties of Arts and Science and they, in particular, are asked in connection with Recommendation 3a to examine their programs with respect to further changes that might be desirable.

Recommendation 3b deals with the question of courses with an historical orientation that is raised in the main body of the report. This recommendation attempts in a limited way to provide such perspective by underlining the importance that should be attached to students being acquainted with the roots of their disciplines and realizing how present levels of understanding have been reached. In some cases a fourth year course in the history of the discipline might be an appropriate way of providing this perspective; in others, it might be better to integrate such material into the regular courses in the subject, a procedure that many lecturers doubtless already employ.

Recommendation 3c impinges on another matter raised in the main body of the report, although it is recognized that this recommendation is not equally pertinent to all areas of study within the university.

Recommendation 1: That to obtain a baccalaureate degree a student must obtain credit in English 100, 3 units of mathematics or a physical or biological science, and 6 units of courses offered by Departments in the Faculty of Arts.

Recommendation 2: That there be sufficient room in all undergraduate programs for at least 6 additional units of electives, which shall not be restricted to the discipline or an ancillary field.

Recommendation 3: That Departments and Faculties be asked to consider the following matters:

a) Whether their students should have breadth requirements additional to those in 1 and 2 above.

b) How they might best acquaint their students with the historical development of their disciplines.

c) In those cases where it is meaningful to do so, how they might best make students aware of ethical aspects of studies in their disciplines or social or environmental consequences of the practice of their professions."

Reports of Committees of Senate

Ad hoc Committee on Breadth (continued)

In speaking to the majority report, Dr. Spencer stated that the committee had assumed that Senate was in favour of "breadth" and therefore the report consisted of recommendations as to how this might be developed and implemented.

Recommendation 1

Dr. Spencer )
Dr. Suedfeld ) That Senate approve the principle that all students should receive a broad exposure to a variety of disciplines in addition to a specialized education in their chosen field of study before completing any baccalaureate degree.

Carried

Recommendation 2

Dr. Spencer )
Mrs. Fulton ) That Senate accept the statement on Breadth of Study in Pre-Baccalaureate Programs (outlined in the majority report) to define the requirement for breadth in pre-baccalaureate programs, and that this or a similar statement become effective for students beginning a program in September 1984 or subsequently, and that all Departments and Faculties shall make the necessary revisions to their programs by that date.

Many members of Senate felt that it would be inappropriate to approve Recommendations 2, 3 and 4 before the Faculties and Schools had had the opportunity of discussing these proposals. The Chairman drew Senate's attention to the recommendation of the Agenda Committee that the Faculties and Schools be asked to comment on the implications before a final decision was made.

Dean Will )
Dean Finnegan ) That the reports of the ad hoc Committee on Breadth be referred to the Faculties and Schools for comment and that they be requested to report back to Senate not later than the November 16, 1983 meeting.

In reply to a query it was confirmed that the reports would be referred to only those Faculties and Schools offering programs leading to a Bachelor's degree.

The motion was put and carried.

## Reports of Committees of Senate

### Ad hoc Committee on Elections

The following report concerning a complaint of irregularities in the campaigning of the candidates in the election of a student representative to Senate for the Faculty of Graduate Studies had been circulated for information:

"The committee was first established by Senate on the recommendation of the Senate ad hoc Committee on the Implementation of the Universities Act, "... to hear appeals on election irregularities; the committee to meet not earlier than 48 hours after the polling has closed, in order that the election results may be available to the committee to decide whether in its opinion such irregularities would have changed the results of the election. The committee would use as its guidelines the Provincial Elections Act for the Province of British Columbia Sections 146 and 147". (see over)

The committee was called following the receipt by the Registrar of two letters duly signed by 3 eligible voters in the election, (the letter being submitted within the 48 hour period following the close of polling, as required in the voting procedures approved by Senate and advertised in The Ubyssey with the announcement of the list of candidates and the polling arrangements).

### Alleged Irregularities

The candidates in the election of a student representative to Senate for the Faculty of Graduate Studies had both reported irregularities in that the A.M.S. campaign procedures had not been adhered to.

The A.M.S. campaign procedures for Board and Senate elections prohibit candidates from campaigning prior to the last day for withdrawing from the elections (January 7, 1983). They also require that campaigning cease by 5:00 p.m. on the day prior to the election, namely Sunday, January 16, 1983.

### Committee Proceedings

The committee met on January 21, 1983 and heard testimony of the two candidates in the election, the A.M.S. Elections Officer and a representative of The Ubyssey staff. It was reported that a letter was printed in The Ubyssey on behalf of one of the candidates on January 7. A subsequent letter from the other candidate was evidently lost by The Ubyssey and not printed. Statements from both candidates were printed in The Ubyssey in which the names of the writers were inadvertently switched. A copy of a letter reporting the error to the Registrar was printed in The Ubyssey, together with an apology on the second day of polling, after campaigning should have ceased.

The committee was assured that the A.M.S. Returning Officer had met with the two candidates and, with their agreement, had arranged for each poll to be given a copy of a notice reporting the error of the candidates' statements. This was attached to the sheets that voters were required to sign before they voted at each poll.

### Decision of the Committee

The committee was satisfied that there had been no deliberate violation of the procedures by either candidate, nor by The Ubyssey, and that the A.M.S. Chief Returning Officer had ensured that voters had been made aware of the error in The Ubyssey within a very short time of the opening of polls. Without knowing the results of the election, the committee was unanimous in its decision that the election results stand."

Study Periods and Examinations

On behalf of the Student Senators, Ms. Hebert presented the proposals outlined in the following statement concerning study periods and examinations:

"Having received a multitude of student complaints regarding the problem of 1982 Christmas examinations being rescheduled in the study period immediately following the end of classes, the Student Senate Caucus pursued this matter. We would like to propose the following three motions for the adoption of Senate:

1) That Senate reaffirm the necessity of a study period of two days (including weekends) between the end of classes and the beginning of the final examination schedule in December and April periods.

RATIONALE: Senate minutes pp.7429-7431, Wednesday, November 12, 1980.

2) If it is desirable to move the date of the final examination from the time scheduled on the final examination schedule, then there must be support from the professor and seventy-five percent of the class. If this consensus is reached it would be possible to hold final examinations during study break.

RATIONALE: During this period of Christmas examinations the student senators received a barrage of complaints on the matter of examinations that were on the final examination schedule, but were rescheduled on the Saturday following the Friday which was the end of classes. We had written letters, phone calls, students attending our meetings, official complaints from the AMS Ombudsoffice, in addition to class representatives from Computer Science representing two to three hundred students. As one student put it, "I'd rather have two exams on one day than have to write an exam that I don't have time to study for." After much debate on this matter this is the solution that the students have proposed. We recognize that it may be necessary or desirable to reschedule an examination during the study period, and we feel that this motion allows for this while maintaining a spirit of cooperation.

3) That we instruct the Registrar to send a memorandum to all departments at the end of November and the end of March to ascertain from all instructors whether their scheduled examination on the final examination schedule will be needed and used.

RATIONALE: Any unused spaces will facilitate rescheduling. Unused examination spaces may not be common, but they do occur. We should make the best use of our allocated time."

Ms. Hebert )
Mr. McCann ) That Senate reaffirm the necessity of a study period of two days (including weekends) between the end of classes and the beginning of the final examination schedule in December and April periods.

Carried

Ms. Hebert )
Mr. McCann ) If it is desirable to move the date of the final examination from the time scheduled on the final examination schedule, then there must be support from the professor and seventy-five percent of the class. If this consensus is reached it would be possible to hold final examinations during the study break.

Study Periods and Examinations (continued)

In amendment:

Dr. Elder ) That the motion be amended to read: "... one
Dean Will ) hundred percent of the class...".

Carried

Some members felt that in order to reach a consensus undue pressure could be brought to bear on those students who did not wish an examination date to be changed. It was also pointed out that the motion was contrary to the motion reaffirming the necessity of a study period which had just been passed by Senate. It was felt that scheduled examination dates should be adhered to and that no exceptions should be made.

The motion, as amended, was put and lost.

It was agreed that it was unnecessary to move the third proposal since it had been agreed that final examinations would not be held during the study period.

Faculty of Applied Science

Faculty membership

It was noted in the material circulated that at the present time the representation from the Faculty of Science was restricted to the Departments of Mathematics and Chemistry and that in order to allow more flexibility, the Faculty of Science were proposing that the representation be changed to four representatives from the Faculty of Science.

Dean Wedepohl ) That the representation from the Faculty of
Dean Finnegan ) Science be changed to four representatives from the Faculty of Science.

Carried

Faculty of Education

Proposal to discontinue the Department of Curriculum and Instructional Studies

It was stated in the material circulated that when the Department was established, the previously existing Centre for the Study of Curriculum and Instruction was housed within it. Experience led to the conclusion that the cross-departmental role of the Centre would be facilitated by separation from the Department and separation was effected in July 1982.

Faculty of Education

Proposal to discontinue the Department of Curriculum and Instructional Studies (continued)

Following the separation of the Centre from the Department, the Acting Head recommended that three alternatives be considered:

1. reassign the faculty members and discontinue the Department;

2. augment the Department by assigning additional faculty members to it;

3. allow the Department to continue with its more limited membership.

The Faculty eventually chose the first course of action. Faculty members in the Centre already held appointments in other Departments and, after much consultation, the Dean arranged for the reassignment of all other members of the Department.

Dean Birch )
Dean Will )

That Senate approve (under section 36 (i) of the University Act) the discontinuance of the Department of Curriculum and Instructional Studies in the Faculty of Education effective July 1, 1983 and so recommend to the Board of Governors.

Carried

Report of the Tributes Committee

Honorary Degrees

Senate was informed that the following persons had accepted invitations to receive honorary degrees at the 1983 Congregation:

Douglas T. Kenny
Annie M. Angus
Robertson Davies
George Manuel
Malcolm F. McGregor
John B. Warren

It was noted that Mstislav Rostropovich had accepted for 1984.

Other business

Financial circumstances of the University

The President commented on the financial circumstances of the University. He stated that, at the invitation of Dr. R. Stewart, Deputy Minister of Universities, Science and Communications, representatives of the University and the Universities Council of B.C. had attended a meeting on February 7, at which a representative of

Other business

Financial circumstances of the University (continued)

the Treasury Board of the Province of British Columbia had reported on the financial situation of the province. He predicted that: (a) in 1983-84 the province would have less revenue than in 1981; (b) for 1982-83 the province faces a deficit of over one billion dollars in spite of cut-backs of $82 million; (c) revenues and expenditures will not match for five years; and (d) the government must bring down expenditures since revenue will not increase significantly in the near future.

Dr. Stewart indicated that the university system would receive a zero increase for 1983–84.

With reference to the shortfall of slightly over $700,000 for 1983-84 that has to be removed in 1982-83, the President mentioned that two goals were guiding the fiscal reduction: (a) the academic teaching function would be preserved at a junior level and (b) no one would be removed from his position.

Finally, the President read to Senate a letter of January 31, 1983, from Dr. W.C. Gibson, Chairman of the Universities Council of B.C., which contained a fiscal warning about new and emergent programs. The letter said:

> "It has been a consistent policy of Council not to interfere in the academic affairs of the universities. I am now writing, however, to sound a fiscal warning to Presidents and Board of Governors concerning new and emergent programs started at the request of the respective universities before the present financial crisis descended upon us. Council feels that a redeployment of shrinking funds may have to be made by the Board within each university so that the broad public interest is served. In Council's view the level of funding of universities in the coming year or years will require hard decisions to be taken if the core offerings of our institutions are to be preserved.
>
> As you are aware, the funding of new and emergent programs is a discretionary initiative of Council. Once granted to a university, such funds, in normal times, have been used precisely for the purpose given. However, it is felt that in today's unpredictable financial context, these funds should be conserved by Boards of Governors for those areas in which high student demand obtains, and where broad social policy is best served. In other words Council relies on the good judgement of Boards of Governors to take whatever emergency action seems wise in the circumstances. The appointment of new faculty to teach new course offerings would, in the current circumstances, seem to me to be unwise. A moratorium of indefinite length on some new and emergent programs may be necessary, regrettable as this may be.
>
> It is Council's understanding that the academic vice-presidents are currently attempting to decide what new and emergent programs ought to proceed from a system perspective in these times of constrained funding. This sort of institutional cooperation will greatly facilitate Council's own decisions when it must ultimately deal with these matters. In my opinion there will not be enough money to continue the past levels of funding for new and emergent programming.

Other business

Financial circumstances of the University (continued)

"In conclusion, let me say that Council relies on each university, through its President and Board of Governors, to expend the limited funds likely to be available in the next few years in a manner which will conserve the excellence built up in our institutions over a considerable period and to develop only selected new programs meeting outstanding Provincial needs."

In conclusion, the President stated that that budget for the universities would not be known until the legislature met and the Minister's estimates were tabled in the house.

The meeting adjourned at 10:30 p.m.

Secretary

Confirmed,

Chairman

APPENDIX 'A'

New Awards recommended to Senate

American Academy of Oral Medicine Annual Prize - The American Academy of Oral Medicine offers an annual prize to the fourth year student who is outstanding in the field of Oral Medicine. The recipient will receive a Certificate of Merit and a one year membership in the American Academy of Oral Medicine. For the period of one year, the awardee will be entitled to attend Academy meetings and will receive a one year subscription to the Journal of Oral Medicine. The award is made on the recommendation of the Faculty. (This award will be made available in the 1982/83 Winter Session.)

Apotex Inc. Bursaries - Two bursaries in the amount of $750 each, the gift of Apotex Inc., are offered annually to students in the Faculty of Pharmaceutical Sciences. They will be awarded to students with good scholastic achievement who show need for financial assistance. (This award will be made available in the 1983/84 Winter Session.)

Alice V. Borden Memorial Prize - This prize is given by her pupils and their parents, students, colleagues, friends and relatives, in memory of Alice V. Borden, 1908–1971, Assistant Professor of Education at The University of British Columbia, who taught and practised pre-school education there from 1958–1971. The intent of the prize is to encourage the dynamic spirit of dedication to excellence and integrity in learning and teaching which they were privileged to experience in this rare person and skillful teacher. A prize of approximately $400 may be awarded annually on the recommendation of the Faculty of Education to a student registered in any course or session of that Faculty, whose chief interest is in early childhood education, and who demonstrates excellence in teaching practice. (This award will be made available in the 1982/83 Winter Session.)

Alice V. Borden Memorial Scholarship in Early Childhood Education - This scholarship is given by her pupils and their parents, students, colleagues, friends and relatives, in memory of Alice V. Borden, 1908–1971, Assistant Professor of Education at The University of British Columbia, who taught and practised pre-school education there from 1958–1971. The intent of the scholarship is to encourage the dynamic spirit of dedication and excellence and integrity in learning and teaching which they were privileged to experience in this rare person and skillful teacher. A scholarship of approximately $400 will be awarded annually on the recommendation of the Faculty of Education to the most outstanding student registered in any course or session of that Faculty, whose chief interest is in early childhood education. (This award will be made available in the 1983/84 Winter Session.)

Leslie D. G. Brooks Memorial Prize - A book prize in the amount of approximately $100 has been established in the memory of Leslie Brooks who entered the Ph.D. program in the Department of English at the age of 70. The award will be made on the recommendation of the Department of English to a graduate student with preference to a student over 30 years of age whose studies have been interrupted for a period of time. (This award will be made available in the 1983/84 Winter Session.)

Cecil J. Coveney Memorial Scholarship - This scholarship of approximately $350 has been established by friends and relatives to honour the memory of Cecil Coveney, who was well-known in the fields of geology and geological engineering. It will be awarded on the recommendation of the Department of Geological Engineering to an undergraduate student who has completed third year geological engineering. First preference will be given to a student in the exploration option. (This award will be made available in the 1983/84 Winter Session.)

APPENDIX 'A'

New Awards recommended to Senate (continued)

Margaret Isabel McKellar Memorial Prize - A perpetual prize in the amount of approximately $45 has been provided in memory of Margaret Isabel McKellar by Mr. and Mrs. Milton Narod. The prize will be made on the recommendation of the Faculty of Medicine, to a student demonstrating proficiency in the program leading to a degree in Medicine. (This award will be made available in the 1983/84 Winter Session.)

Jagat S. Parmar Memorial Scholarship - A scholarship in the amount of $250 has been made available by Mrs. G. C. Parmar in memory of her husband, Jagat S. Parmar. The award will be made to a student in the Faculty of Science who combines high academic standing with financial need. (This award will be made available in the 1983/84 Winter Session.)

John Oliver Piercy Memorial Scholarship - In memory of John Piercy, who was at the time of his death in 1982, Associate Registrar at U.B.C., a scholarship in the amount of approximately $750 has been made available by his family, friends and colleagues. Born and educated on Vancouver Island, John Piercy joined U.B.C. following a career in the Canadian Armed Forces. The scholarship serves to pay tribute to the special concern that he had for the welfare of students. The award will be made to a student from northern or central Vancouver Island (School Districts 69–72, 84 and 85) with preference given to a student entering directly from Grade XII. (This award will be made available in the 1983/84 Winter Session.)

Real Estate Council Fellowships - The Real Estate Council of British Columbia, as part of their continuous support, provides funds for fellowships to students in Commerce and Business Administration who are taking the Urban Land Economics Graduate program, have high academic standing and are deserving of financial aid. The awards are made on the recommendation of the Faculty. (This award will be made available in the 1983/84 Winter Session.)

Smith Kline and French Canada Ltd. Bursary - A bursary in the amount of $500, established by Smith Kline and French Canada Ltd., will be awarded to a student in the Faculty of Pharmaceutical Sciences. It will be offered to a student with satisfactory academic standing who demonstrates financial need. (This award will be made available in the 1983/84 Winter Session.)

Christina Agnes Taylor Scholarship - An annual scholarship in the amount of approximately $400 has been made available to a woman student of special needs and high academic performance as a bequest of Christina Agnes Taylor. Preference will be given to a student in a degree program who, for special domestic or other circumstances, cannot meet the full–time registration requirements, but who has achieved good marks on her program. Candidates for the award will be considered from applicants for the University Women's Club of Vancouver, Margaret Redmond Scholarship (0613). The award will be made on the recommendation of the Women Students' Office. Applications must be submitted by June 1st. (This award will be made available in the 1983/84 Winter Session.)

Workers Compensation Board Fellowship - Two fellowships in the amount of $4,000 each have been provided through an endowment established by the Workers Compensation Board of B.C. The fellowships will be awarded to students entering the M.Sc. program in Audiology and Speech Sciences. Recipients will be selected on the basis of academic excellence. (This award will be made available in the 1983/84 Winter Session.)

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE

Four-Year Engineering Program

First-Year - First term: MATH 153, PHYS 170, ENGL 100, CPSC 151, APSC 152

A. CHEM 150

Second term: MATH 154, PHYS 175, ENGL 100, MATH 152, PHYS 150

B. GEOL 150 (or APSC 150)
APSC 120

Courses A and B will be given in both terms with students taking A or B in first term and B or A in second term.

New course APSC 150 (1½) Resources and Engineering

Changes APSC 152, 278 - change in title, description, hours and units (now 1½)

Deletion APSC 251

Bio-Resource Engineering

Second Year - First term: BIOE 250, MATH 253, MATH 255, MECH 260, ELEC 263, Technical elective (1½), Humanities (1½) (CIVL 235 taught at end of 1st year)

Second term: MATH 254, MATH 257, MECH 265, MECH 280, BIOE 285, MECH 270, Humanities (1½)

Third Year - First term: BIOE 355, BIOE 356, BIOE 366, APSC 380, MICR 417, SOIL 413, elective (1½)

Second term: MATH 351, BIOE 357, BIOE 376, ELEC 370, BIOE 361, two electives (1½) each

Fourth Year - First term: BIOE 499, BIOE 489, BIOE 471, BIOE 490, APSC 450, Humanities (1½), plus 9 units technical electives with a minimum of 4½ units taken from department offerings.

Second term: BIOE 499, BIOE 489, BIOE 472, Humanities (1½), Technical electives (4½) (A minimum of 10½ units of humanities are required for completion of the program.)

New courses

| | | | |
|---|---|---|---|
| BIOE | 361 | (1½) | Soil and Water Engineering |
| | 366 | (1½) | Heat Transfer |
| | 456 | (1½) | Design of Closed Environments |
| | 464 | (1½) | Irrigation and Drainage Engineering |
| | 376 | (1½) | Applications of Heat, Mass and Momentum |

Changes

| | |
|---|---|
| BIOE 480 | - change in title and description |
| 471, 472 | - change in description |
| 490 | - change in title |

Deletions BIOE 365, 375, 461, 462

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE (continued)

Chemical Engineering

Second Year - First and Second term: APSC 278, CHML 241, CHML 242, CHML 251, CHML 261, CHEM 250, CHEM 251, CHEM 252, CHEM 255, CHEM 260, MATH 253, MATH 254, MATH 255, MATH 257, Humanities elective (3)

Third Year - First and Second term: CHML 341, CHML 345, CHML 346, CHML 351, CHML 353, CHML 356, CHML 357, CHML 358, CHML 359, CHML 362, CHML 363, CHEM 352, ELEC 263, MATH 351, Technical elective (1) Humanities elective(s) (3)

Fourth Year First and Second term: APSC 450, CHML 442, CHML 454, CHML 455, CHML 457, CHML 464, CHML 491, CHML 492, CHML 498, ELEC 370, Technical elective (2), Humanities elective(s) (3)

New courses

| | | | |
|---|---|---|---|
| CHML | 241 | (1½) | Mass and Energy Balances |
| | 242 | (1) | Chemical Process Technology |
| | 261 | (1½) | Chemical Engineering Lab I |
| | 341 | (1½) | Diffusional Operations I |
| | 345 | (1) | Applied Thermodynamics |
| | 346 | (1) | Applied Thermodynamics II |
| | 358 | (1) | Properties of Fluids |
| | 359 | (1½) | Chemical Engineering Economics |
| | 362 | (1) | Chemical Engineering Laboratory II |
| | 363 | (1) | Chemical Engineering Laboratory III |
| | 442 | (1½) | Diffusional Operations II |
| | 457 | (1) | Process Synthesis |
| | 464 | (1½) | Chemical Engineering Laboratory IV |
| | 491 | (½) | Thesis Proposal |
| | 492 | (2½) | Thesis |

Change CHML 498 - change in unit value from (1½) to (1)

Deletions CHML 250, 352, 354, 355, 360, 450, 453, 460, 464, 499

Civil Engineering

Second Year - First and Second term: MATH 253, MATH 255, CIVL 215, CIVL 225, CIVL 230, CIVL 232, CIVL 235, MATH 254, MATH 251, Humanities (3) CIVL 205, CIVL 231, CIVL 216, CIVL 220

Third Year - First and Second term: MATH 257, CIVL 300, CIVL 310, CIVL 315, CIVL 320, CIVL 332, ELEC 263 or PHYS 252, CIVL 301, CIVL 311, CIVL 316, CIVL 330, CIVL 333, CIVL 340, Humanities (1½) (Students who have not completed GEOL 150 (or equivalent) are required to take this course in first term)

Fourth Year - CIVL 400, CIVL 405, CIVL 410, CIVL 430, CIVL 435, Technical elective (1½), APSC 450, CIVL 402, CIVL 415, CIVL 431, CIVL 445 (Experiment Design OR Engineering Project), two Technical electives (1½) each, Humanities (3).

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE

Civil Engineering (continued)

| | | | | |
|---|---|---|---|---|
| New courses | CIVL | 220 | (1½) | Civil Engineering Materials I |
| | | 225 | (1½) | Computer Application in Civil Engineering |
| | | 300 | (1½) | Engineering Economic Analysis |
| | | 405 | (1½) | Environmental Impact Studies |
| | | 445 | (1½) | Experimental Design |
| Changes | CIVL | 230 | | - change in departmental listing, number, title, description, units and hours (previously APSC 270) |
| | | 232 | | - change in departmental listing, number, title, description, units and hours (previously APSC 275) |
| | | 250 | | - change in number now 265 |
| | | 265 | | - change in number now 205 |
| | APSC | 281 | | - change in departmental listing and split into two courses: CIVL 215 and 216 |
| | CIVL | 355 | | - change in number, title, description and hours now 231 |
| | | 356 | | - split into two courses: CIVL 356 and 321 |
| | | 360 | | - split into two courses: CIVL 315 and 316 |
| | | 367 | | - split into two courses: CIVL 310 and 311 |
| | | 371 | | - split into two courses: CIVL 332 and 333 |
| | | 374 | | - change in number, description, units and hours now 340 |
| | | 375 and 495 | | combined into one course, now 301 |
| | | 370 | | - split into two courses: CIVL 330 and 430 |
| | | 365 | | - change in number, units and hours now 406 |
| | | 251 | | - change in number, description, units and hours now 435 |
| | | 447 | | - change in number, description, units and hours now 417 |
| | | 478 | | - change in number, description, units and hours now 418 |
| | | 453 and 456 | | combined into one course: now 436 |
| | | 463 | | - split into two courses: CIVL 431 and 432 |
| | | 464 | | - change in number, title, description, units and hours now 415 |
| | | 466 | | - change in number, title, description, units and hours now 416 |
| | | 471 | | - change in number, title, description, units and hours now 442 |
| | | 491 | | - change in number, title, description, units and hours now 446 |
| | | 468 | | - change in number now 407 |
| | | 474 | | - change in number and description now 412 |
| | | 470 | | - split into two courses: CIVL 440 and 441 |
| | | 472 | | - change in number and description now 410 |
| | | 473 | | - change in number and units now 411 |
| | | 475 | | - change in number, description, units, hours and prerequisites now 420 |
| | | 476 | | - change in number and title now 402 |

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE

Civil Engineering (continued)

Changes — CIVL 490 - change in number, title, units and hours now 400

Deletions — CIVL 465, 469

Electrical Engineering

Second Year - First term: MATH 253, MATH 255, ELEC 251, ELEC 252, ELEC 256, ELEC 258, Humanities (1½)

Second term: MATH 254, MATH 257, MATH 351, ELEC 254, ELEC 261, Humanities (1½)

Third Year - First term: MATH 350, ELEC 356, ELEC 359, ELEC 361, ELEC 371, Technical elective (1½), Humanities (1½)

Second term: ELEC 352, ELEC 358, ELEC 360, ELEC 362, ELEC 372, Technical elective (1½), Humanities (1½)

Fourth Year - First term: APSC 450, ELEC 473, ELEC electives (4½), Technical elective (1½), free elective (3)

Second term: ELEC 498, Elec 473, ELEC electives (4½), Technical elective (1½), free elective (3)

New courses

| | | | |
|---|---|---|---|
| ELEC | 263 | (1½) | Applied Electrical Circuits and Devices |
| | 362 | (1½) | Applications of Electromagnetic Fields II |
| | 371 | (1½) | Power Circuits and Devices |
| | 372 | (1½) | Rotating Machines |

Changes

ELEC 251, 254 - change in title, description, units and hours
261 - change in description, units and hours
361 - change in title, description, units and hours
356 - change in title
370 - change in units and hours
365 - change in description, units and hours
455, 463, 469, 477, 460, 461, 464, 466, 468, 483, 484, 486, 490, 491, 492, 493, 494 - change in units and hours

Deletions — ELEC 264, 353

Geological Engineering

Second Year - First term: CIVL 235, MATH 253, MATH 255, GEOL 210, GEOL 204, MECH 260, Humanities (1½), APSC 278 or GEOL 150

Second term: MATH 254, MATH 257, GEOL 210, GEOL 204, MECH 280, MATH 351, Humanities (1½)

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE

Geological Engineering (continued)

Third Year (Common for Options I and III)

- First term: CIVL 336, CIVL 310, MMPE 303, MMPE 201, GEOL 341, GEOL 342, GEOL 301, Humanities (1½)

Second term: CIVL 311, GEOL 303, elective (1½), GEOL 306, GEOL 302, GEOL 326, Humanities (1½)

(Option II)

- First term: GEOP 320, GEOP 322, GEOL 342, GEOL 341, PHYS 251, elective (1½), Humanities (1½)

Second term: GEOP 321, GEOL 317, GEOL 368, elective (1½), MATH 350, GEOL 306, Humanities (1½)

Fourth Year (Option I)

- First term: GEOL 435, APSC 450, MMPE 403, GEOP 400, GEOL 418, GEOL 321, GEOL 445, GEOL 400, MMPE 491

Second term: GEOL 499, MMPE 404, GEOP 400, GEOL 418, GEOL 425, GEOL 447, elective (1½)

(Option II)

- First term: GEOL 435, GEOP 420, GEOP 421, elective (1½), PHYS 351, MMPE 491, GEOL 462 or GEOL 445, GEOL 400, APSC 450

Second term: GEOP 426, GEOP 421, GEOP 499, three electives (1½) each

(Option III)

- First term: GEOL 435, APSC 450, MMPE 403, GEOP 400, CIVL 410, GEOL 400, GEOL 462, two electives (1½) each

Second term: GEOL 499, MMPE 404, GEOP 400, CIVL 411, CIVL 402, GEOL 452, GEOL 472, elective (1½)

Changes

| | |
|---|---|
| MMPE 350 | - change in number and description now GEOL 368 |
| GEOL 499 | - change in hours and units now (1½) |
| GEOL 305 | - change in number now GEOL 400 |

Mechanical Engineering

Second Year - First term: MATH 253, MATH 255, MECH 250, MECH 260, APSC 278, Humanities elective (3), PHYS 252

Second term: MATH 254, MECH 290, MECH 265, MECH 280, APSC 260, ELEC 263, MECH 270

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE

Mechanical Engineering (continued)

| | | |
|---|---|---|
| Third Year | - First term: | MECH 360, MECH 370, MECH 355, MECH 390, ELEC 365, MATH 257, MECH 350, MECH 398 |
| | Second term: | MECH 365, MECH 375, MECH 371, MECH 391, MECH 380, METL 380, ELEC 370, MATH 350 |
| Fourth Year | - First term: | MECH 465, MECH 450, MECH 455, ECON 309, MECH 480, MECH 470, MECH 475, Humanities elective (1½) |
| | Second term: | MECH 466, MECH 451, MECH 456, ECON 309, MECH 490, MECH 460, APSC 450, elective (3) |

Naval Architecture Option - Third Year

| | |
|---|---|
| First term: | MECH 360, MECH 370, MECH 355, MECH 390, ELEC 365, MATH 256, MECH 350, MECH 398 |
| Second term: | MECH 365, MECH 375, MECH 340, MECH 341, MECH 391, MECH 380, ELEC 370, MATH 350 |

Naval Architecture Option - Fourth Year

| | |
|---|---|
| First term: | MECH 465, MECH 450, MECH 455, ECON 309, MECH 440, MECH 470, MECH 442, Humanities elective (1½) |
| Second term: | MECH 466, MECH 451, MECH 456, ECON 309, MECH 490, METL 380, APSC 450, MECH 441 |

New courses

| | | |
|---|---|---|
| MECH 270 | (1) | Principles of Energy Conversion |
| 340 | (1½) | Statics of Marine Vehicles |
| 341 | (1½) | Ship Resistance and Propulsion |
| 355 | (1½) | Instruments and Measurements |
| 371 | (½) | Heat Engine Laboratory |
| 375 | (1½) | Heat Transfer I |
| 390 | (1½) | Engineering Data Analysis |
| 442 | (1½) | Experimental Naval Architecture |
| 460 | (1½) | Mechanics of Materials II |
| 470 | (1) | Thermal Power Generation |
| 480 | (1½) | Fluid Mechanics II |
| 490 | (1½) | Production Engineering |

Changes

| | |
|---|---|
| APSC 270 | - change in title, description, units, hours and number now MECH 260 |
| APSC 275 | - change in description, hours and number now MECH 265 |
| APSC 281 | - change in title, description, units, hours and number now MECH 280 |

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE

Mechanical Engineering (continued)

| | | | |
|---|---|---|---|
| Changes | MECH | 252 | - change in title, descriptions, units, hours and number now 252 |
| | | 258 | - change in title, description, units, hours and number now 290 |
| | | 363 | - change in description, units, hours and number now 360 |
| | | 364 | - change in description, units, hours and number now 350 |
| | | 378 | - change in description, units, hours and number now 370 |
| | | 365 | - change in title, description, units and hours |
| | | 384 | - change in title, description, units, hours and number now 380 |
| | | 391 | - change in description, units and hours |
| | | 440, 441, 465, 466 | - change in title, description, units and hours |
| | | 463 | - split into two courses: MECH 450 and 451 |
| | | 472 | - split into two courses: MECH 455 and 456 |
| | | 476 | - change in title, description, units, hours and number now 475 |
| Deletion | MECH | 372 | |

Metallurgical Engineering

Second Year - First and Second term: MATH 253, MATH 254, MATH 255, MATH 257, MATH 351, Humanities (3) ELEC 263, METL 252, METL 262, METL 264, MECH 260, APSC 278, MECH 280

Third Year - First and Second term: Humanities (3), METL 350, METL 352, METL 360, METL 362, METL 370, METL 374, METL 376, METL 378, METL 382, METL 390, METL 398, MMPE 252, plus two units of electives approved by the Department

Fourth Year - First and Second term: APSC 450, METL 450, METL 456, METL 470, METL 472, METL 476, METL 480, METL 490, METL 495, METL 498, METL 499, plus 8 units of approved electives with at least 5 units selected from a list of METL electives

| | | | |
|---|---|---|---|
| Changes | METL | 252 | - change in description |
| | | 352 | - change in units and hours |
| | | 370 | - change in description, units and hours |
| | | 380 | - change in description, units and hours |
| | | 378 | - change in title, description, units and hours |
| | | 382 | - change in description |
| | | 460 | - change in number now 362 |
| | | 456 | - change in title |
| | | 476 | - change in title and description |
| Deletions | METL | 353, 474 | |

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE (continued)

Mining and Mineral Process Engineering

Second Year - First and Second term: MATH 253, MATH 254, MATH 255, MATH 257, MATH 351, PHYS 252, CHEM 262, GEOL 300, APSC 278, ELEC 263, MECH 260, MECH 280, MMPE 201, MMPE 231, CIVL 235, elective (1½)

Third Year - First and Second term: GEOL 354, GEOL 368, MMPE 300, MMPE 301, MMPE 303, MMPE 304, MMPE 331, MMPE 332, MMPE 333, MMPE 391, MMPE 392, MMPE 393, MMPE 395, MMPE 394, Humanities, Socials, Admin. (3), CIVL 336

Fourth Year - First and Second term: APSC 450, METL 372, MMPE 491, MMPE 493, MMPE 494, MMPE 495, MMPE 496, MMPE 492, MMPE 401, MMPE 431, electives (6½) chosen in consultation with Department, Humanities, Socials, Admin. (3)

Mining elective: MMPE 402, 403, 404, 461
Mineral Processing electives: MMPE 462, 432, 433, METL 351
Other electives: GEOL 358, 317, 447

New courses

| | | | |
|---|---|---|---|
| MMPE | 262 | (1½) | Physical Chemistry of Surfaces |
| | 391 | (1) | Capital and Operating Cost Estimation |
| | 392 | (1) | Materials Handling |
| | 395 | (1) | Computer Applications in Mining and Mineral Processing |
| | 402 | (1) | Mine Ventilation |

Changes

| | |
|---|---|
| MMPE 251 | - change in number now 201 |
| 252 | - change in number now 231 |
| 300 | - change in hours |
| 301 | - change in units and hours |
| 356 | - change in units and number now 303 |
| 370 | - change in units and number now 331 |
| 372 | - change in units and number now 333 |
| 398 | - change in number now 394 |
| 358 | - change in number now 304 |
| 390 | - change in number now 393 |
| 375 | - change in hours and number now 332 |
| 410 | - change in title, hours and number now 496 |
| 411 | - change in title, hours and number now 495 |
| 452 | - change in hours and number now 491 |
| 465 | - change in hours and number now 432 |
| 475 | - change in hours and number now 462 |
| 480 | - change in title, description and number now 494 |
| 455 | - change in title, description and number now 403 |
| 456 | - change in title, description and number now 404 |

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE

Mining and Mineral Process Engineering (continued)

| | | | |
|---|---|---|---|
| Changes | MMPE | 490 | - change in number now 493 |
| | | 499 | - change in number now 492 |
| | | 473 | - change in number now 461 |
| | | 454 | - change in units, hours and number now 401 |
| | | 471 | - change in units, hours and number now 433 |
| | | 460 | - change in units and number now 431 |

Deletions MMPE 412, 470, 498, 451

Engineering Physics

Revised Five-Year Program

| | | |
|---|---|---|
| Second Year | - First term: | MATH 253, MATH 255, MATH 351, PHYS 251, PHYS 255, APSC 278, ELEC 251 |
| | Second term: | MATH 254, MATH 257, PHYS 250, CPSC 118, ELEC 254, MECH 280, Humanities (1½) |
| Third Year | - First term: | Core - ECON 309, MATH 300, PHYS 351, PHYS 352, ELEC 252, PHYS 398 |
| | (Option 1) | Core courses plus ELEC 356, ELEC 256, CPSC 215 |
| | (Option 2) | Core courses plus MECH 260, METL 376 |
| | (Option 3) | Core courses plus MECH 260, GEOL 210 |
| | Second term: | Core - ECON 309, MATH 300, MATH 362, PHYS 350 |
| | (Option 1) | Core courses plus CPSC 215 |
| | (Option 2) | Core courses plus ELEC 366 |
| | (Option 3) | Core courses plus GEOL 150, GEOL 210, ELEC 366 |
| Fourth Year | - First term: | Core - APSC 450, MATH 430, PHYS 458, plus either CPSC 302 or CPSC 350 |
| | (Option 1) | First and Second term - core courses plus ELEC 359, ELEC 477, ELEC 360, ELEC 477 plus two of ELEC 371, CPSC 313, ELEC 358 |
| | (Option 2) | First and Second term - core courses plus MECH 378, MECH 355, MECH 365, MECH 376 plus two of ELEC 371, MECH 250, MECH 360, ELEC 372, MECH 290, MECH 380, METL 380 |
| | (Option 3) | First and Second term - core courses plus METL 370, MECH 360, MECH 250, METL 360, METL 374, METL 378, plus one of APSC 380, ELEC 367 |

APPENDIX 'B'

Course and curriculum proposals

FACULTY OF APPLIED SCIENCE

Engineering Physics - Revised Five-Year Program (continued)

Fourth Year - (Option 4) First and Second term - core courses plus GEOP 321, GEOP 322, GEOP 426, GEOP 422 plus two of GEOL 342, GEOL 445, GEOL 256, GEOL 400, GEOL 315

(Option 5) First and Second term - core courses plus CPSC 313, CPSC 315 plus 3 units of Technical electives from another engineering discipline

(Option 6) First and Second term - core courses plus MECH 378, OCGY 300, OCGY 408, APSC 380, MECH 380, OCGY 400 plus two of MECH 440, MECH 482, MECH 441

Fifth Year - First and Second term - Core – APSC 479, Humanities (1½), Free elective (1½) plus two of PHYS 473, PHYS 474, PHYS 477

(Option 1) First and Second term - core courses plus ELEC 455, ELEC 464, ELEC 467, plus 3 units if ELEC 469, ELEC 483, ELEC 476, ELEC 372, ELEC 466

(Option 2) First and Second term - core courses plus MECH 450 MECH 465, MECH 475, MECH 466, plus 4 units of the following including any electives offered in Year IV: MECH 470, MECH 481, MECH 480, CPSC 405, MECH 471, MECH 481, CPSC 403

(Option 3) First and Second term - core courses plus METL 470, METL 495, plus 6 units of the following (including electives not taken in Year IV): METL 472, METL 480, METL 492, METL 484, METL 488, METL 494, MECH 450, METL 476, METL 486, METL 482

(Option 4) First and Second term - core courses plus GEOP 420, GEOP 421, GEOP 424, plus two of CPSC 405, METL 464, OCGY 401, APSC 380, ELEC 367, CPSC 403

(Option 5) First and Second term - core courses plus CPSC 402, CPSC 405, CPSC 410, CPSC 414, CPSC 403, CPSC 407, CPSC 415, CPSC 413, CPSC 430, CPSC 435, plus 3 units of Technical electives from another engineering discipline

(Option 6) First and Second term - core courses plus OCGY 449, OCGY 448, CIVL 447, ELEC 367 plus one of CIVL 365, CPSC 403

APPENDIX 'B'

Course and curriculum proposals (continued)

FACULTY OF SCIENCE

Chemistry

| | | | |
|---|---|---|---|
| New courses | CHEM 150 | (2) | Engineering Chemistry |
| | 251 | (1½) | Physical Chemistry I |
| | 252 | (1) | Physical Chemistry II |
| | 262 | (1½) | Physical Chemistry of Surfaces |
| Changes | CHEM 255 - change in hours, description and prerequisites | | |
| | 350 - change in prerequisites and number now 250 | | |
| Deletions | CHEM 156, 257 | | |

Computer Science

| | | | |
|---|---|---|---|
| New course | CPSC 151 | (1½) | Introduction to Fortran Programming |
| Deletion | CPSC 251 | | |

Mathematics

| | | | |
|---|---|---|---|
| New courses | MATH 152 | (1½) | Linear Algebra and Differential Equations |
| | 153 | (1½) | Differential Calculus |
| | 154 | (1½) | Integral Calculus |
| | 253 | (1½) | Multivariable Calculus |
| | 254 | (1½) | Vector Calculus |
| | 255 | (1½) | Ordinary Differential Equations |
| | 257 | (1½) | Partial Differential Equations |
| | 351 | (1½) | Introduction to Statistics |
| Changes | MATH 350 - change in units, hours and prerequisites | | |
| Deletions | MATH 150, 151, 165, 251, 256, 260 | | |

Physics

| | | | |
|---|---|---|---|
| New courses | PHYS 150 | (2) | Thermodynamics and Wave Phenomena |
| | 170 | (1½) | Statics |
| | 175 | (1½) | Dynamics |
| | 250 | (2) | Introduction to Modern Physics |
| | 252 | (1) | Introduction to Electric and Magnetic Fields |
| | 255 | (1½) | Mechanics |
| | 350 | (1) | Quantum Mechanics I |
| | 452 | (1½) | Quantum Mechanics II |
| | 477 | (1½) | Applied Plasma Physics |
| Changes | PHYS 251, 351 - change in units, hours and description | | |
| | 359 - change in units, hours, title, description and number now 352 | | |
| | 356 - change in units, hours, description and number now 455 | | |
| | 458 - change in units and hours | | |
| | 453 - change in units, hours and number now 473 | | |
| | 454 - change in number now 474 | | |
| Deletions | PHYS 155, 156, 158, 355 | | |