

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

SENATE

The regular meeting of Senate was held on Tuesday, March 14, 1995, at 8:00 p.m. in Room E5004.

44. PRESENT

Dr. J. Tuinman (Acting Chair), Dr. K. Bindon, Professor G. Gorman (for Dean W. Blake), Mr. G. Collins, Mr. R. Ellis, Professor M. Lamb, Dean W. Ludlow, Dean T. Murphy, Dean T. Piper, Dean R. Seshadri, Acting Dean C. Sharpe, Dean G. Skanes, Dr. M. Volk, Dr. G. Bassler, Dr. J. Bear, Mr. E. Brown, Dr. G. Clark, Professor S. Findlay, Dr. G. Gardner, Dr. R. Gordon, Dr. G. Gunther, Dr. C. Harley, Dr. O. Janzen, Dr. G. Kealey, Dr. R. Lucas, Capt. W. Norman, Dr. P. Nosko, Dr. R. Payne, Dr. N. Rich, Dr. D. Treslan, Dr. C. Turner, Dr. M. Wernerheim, Dr. H. Williams, Mr. D. Balsom, Mr. D. Hynes, Mr. D. Gallant, Mr. B. McCartney, Ms. W. Stimson.

Dr. Robert Haines, Sir Wilfred Grenfell College was also in attendance to answer questions with regard to the new Environmental Science Degree Programme proposed by Sir Wilfred Grenfell College.

45. APOLOGIES FOR ABSENCE

The President, Dr. J. Crosbie, Mr. L. O'Reilly, Dr. J. Bradley, Dr. M. Haddara, Dr. G. Handcock, Dr. J. Kennedy, Dr. W. Locke, Dr. R. Moore-Orr, Dr. R. Rompkey.

46. MINUTES

Consideration of the minutes of the regular meeting of Senate held on February 14, 1995, was deferred until the April meeting of Senate.

47. Report of the Committee on Honorary Degrees and Ceremonial

A memorandum dated March 10, 1995, advising that in accordance with the Procedures for Appointment of Public Orator, which were approved by Senate on December 13, 1994, nominations were invited from eligible academic staff members to fill this vacancy and the eligible nominations were considered by the Committee on Honorary Degrees and Ceremonial at two meetings held on February 16 and March 10, 1995. While the Procedures state that when more than one qualified nomination is received, the Committee on Honorary Degrees and Ceremonial will select one candidate for consideration by Senate, the Committee concluded that two of the candidates equally fulfilled the prime criterion for nomination and for appointment i.e. "demonstrated excellence in the duties associated with the position...". During its discussions of the matter, the Committee acknowledged that since this is a

Senate appointment, the procedures should provide for input from all senators. The standard procedure for such input in a competitive situation is that employed for the election of senators to the Committee on Committees, i.e. a secret ballot election where members of Senate each vote for the candidate of their choice.

It was therefore agreed to recommend to Senate that, on this particular occasion, the Procedures for Appointment of Public Orator be amended to permit the Committee on Senate Elections to conduct a secret ballot election by mail.

Following discussion, it was moved by Mr. Collins and seconded by Dr. Sharpe that the Procedures for Appointment of Public Orator be amended as requested by the Committee on Honorary Degrees and Ceremonial.

When put to a vote, the motion was defeated.

Report of the Senate Advisory Committee on the University Bookstore

At a meeting held on April 12, 1994, Senate deferred consideration of a Report from the Senate Advisory Committee on the University Bookstore dated March 24, 1994, pending comment from the Dean of Student Affairs and Services.

A memorandum dated January 25, 1995, was subsequently received from the Dean of Student Affairs and Services together with comments from the Director, General Student Services.

Following consideration, it was moved by Dr. Treslan, seconded by Dr. Ludlow, and carried that the Report of the Senate Advisory Committee on the University Bookstore together with the above-noted memoranda from the Dean of Student Affairs and Services and the Director of General Student Services be received.

48. STUDENT APPEAL TO SENATE

MUN NO. 8253015

Following the normal appeals process, this student's appeal that she be granted a waiver of Clause 2(b) of the Regulations for the General Degree of Bachelor of Arts, was denied by the Executive Committee of Senate at a meeting held on September 29, 1994. The student subsequently requested that her appeal be heard by Senate.

Following consideration, it was moved by Dr. Sharpe, seconded by Dean Murphy and carried that this student's appeal be DENIED.

*Report of the Senate Committee on Undergraduate Studies

It was agreed that the following undergraduate calendar changes be approved or received for information as

appropriate:

49. Environmental Science Degree Programme (SWGK)

The Chairman of the Senate Committee on Undergraduate Studies introduced a proposal from Sir Wilfred Grenfell College for an Environmental Science Degree Programme.

Dr. Gordon initiated a discussion regarding the consultation process which had taken place with respect to this proposal, particularly in the Department of Biology. He suggested that, while consultation had taken place between representatives of Sir Wilfred Grenfell College and the Head of the Department of Biology and the Undergraduate Officer, other faculty members within the department had not been consulted.

It was pointed out by the representatives from Sir Wilfred Grenfell College that the proposal has been in preparation for the past three years, during which time considerable consultation has taken place with the current Dean of Science and his predecessors, as well as with the Heads and faculty members of the relevant Science Departments.

It was suggested that, in light of the fact that the issue of consultation has arisen at two successive meetings of Senate, the procedures for ensuring adequate consultation should be reviewed and possibly revised.

It was then moved by Dr. Gordon and seconded by Dr. Williams that the proposal for the Environmental Science Degree Programme be referred back for further consultation with the Department of Biology.

When put to a vote, the motion was defeated.

Following further discussion, it was moved by Dr. Treslan, seconded by Dr. Bindon and carried, that the following proposal for the Environmental Science Degree programme at Sir Wilfred Grenfell College be approved:

"SPECIALIZATION IN ENVIRONMENTAL SCIENCE

GENERAL PROGRAMME REQUIREMENTS

The B.Sc. in Environmental Science requires the completion of at least 40 credits. The student will complete an Environmental Science Core (17-18 credits), providing a broad appreciation of the interrelationships inherent in any study of the environment, and a more specific stream (at least 10 courses) which will provide the depth and focus for the degree programme. Students must ensure that their chosen combination of required and elective courses meets the Sir Wilfred Grenfell College Core Programme requirements.

Environmental Science Core

The Environmental Science Core Requirements are outlined

below. New courses in the Environmental Science Core are designated "EnSc" for Environmental Science and are numbered according to the scheme outlined under the heading "New Course Numbering".

The student must complete:

(a) Biology 1001, 1002, 2600
Chemistry 1200*, 1001*
Mathematics 1000* (or 1080 and 1081), 2510
Environmental Science 4080 (Computer-based Scientific Writing)
Environmental Science 4000 (Environmental Science Seminar)
Environmental Science 4950 (Research Project in Environmental Science I)

(b) one of the following pairs:

Earth Science 1000/1001
Geography 1000/2102
Physics 1200*/1201* (or 1050/1052)

(c) at least two of:

Anthropology 3083 (Cultural Crises and the Environment)
Philosophy 2809 (Environmental Ethics)
Political Science 3731 (Environmental Policy)

(d) at least 3 of:

Environmental Science 2370 (Global Environmental Change)
Environmental Science 2371 (Oceanography)
Environmental Science 2430 (Energy and the Environment)
Environmental Science 2450 (Meteorology)
Geography 2195 (Introduction to Maps)

* It is strongly recommended that students considering the Chemistry stream of the Environmental Science Programme complete asterisked courses in their first year.

Stream Requirements

Courses required in each stream are listed below:

Biology stream (ESB)

(a) Biology 2010, 2122, 3041 (or 3250), 3610, 4360, 4820
Chemistry 2300 or 2440
Environmental Science 3130, 4130
Mathematics 2511

(b) a second pair beyond the pair selected from Environmental Science Core (b):

Earth Science 1000/1001
Geography 1000/2102

Physics 1200/1201 (or 1050/1052)

Chemistry stream (ESCh)

Chemistry 2210, 2300, 240A/B (or 2400/2401)

Environmental Science 2261, 3210, 3211, 3260, 3261, 4230, 4240

Mathematics 1001*

Philosophy 2809

* It is strongly recommended that students complete asterisked courses in their first year.

HONOURS PROGRAMME REQUIREMENTS

An honours degree offers depth in a discipline or coherent multidisciplinary concentration greater than that attained by completion of the general bachelor's specialization, while still meeting the Core Programme requirements of Grenfell general degree programmes. An honours programme also requires a higher level of academic achievement. The Grenfell honours Bachelor of Science degree is a 40 credit programme that is normally completed within four years. The following requirements govern the honours degree of Bachelor of Science in Environmental Science (B.Sc. Honours Environmental Science) at Sir Wilfred Grenfell College. (The normal sequences of courses for both streams are shown in Tables B.3 and B.5.)

Declaration of Intent

The candidate shall submit a declaration of intent to pursue the honours degree, in writing, to the coordinator(s)/head(s)/programme chair(s) of the honours programme in question and to the College Registrar not later than the beginning of the applicant's fifth semester.

Note: Students who wish to pursue the honours degree programme in Environmental Science and who are in attendance at a recognized post-secondary institution normally may not transfer into the Environmental Science programme at a point later than the end of the fourth semester.

Course Requirements for the Honours Degree in Environmental Science

1. In addition to the College Core Programme requirements, which must be met by all Grenfell degree candidates, those who have declared an intention to pursue the honours programme in Environmental Science must complete the Environmental Science Core requirements and the course requirements of a specific stream, as well as any other courses to achieve a total of 40 course credits.
2. Honours candidates must complete two courses at the fourth-year level beyond those included in the general degree specialization (or stream). These courses must be drawn from the candidate's honours specialization as follows:

- a) For the honours Bachelor of Science in Environmental Science (Biology):

Biology 4309 (Applied Biology)
Biology 4505 (Systematics and Biogeography)

- b) For the honours Bachelor of Science in Environmental Science (Chemistry):

Environmental Science 4239 (Aquatic Chemistry II)
Environmental Science 4249 (Environmental Organic Chemistry)

3. The courses required under 2 above may be changed upon application to the Academic Studies Committee.
4. Exceptional students, in close consultation with a faculty advisor and the agreement of the co-ordinator(s) affected, may select fourth-year honours requirement courses of their own choosing, so long as such selections are consistent with the Specializations to which they are added. Such honours selections will be subject to approval by Academic Studies Committee.
5. Honours graduates of the Environmental Science Programme will have also completed a two-semester research project, consisting of the general degree one-semester project course (Environmental Science 4950) and a further one-semester research course (Environmental Science 4959).

Dissertation

The research project sequence (Environmental Science 4950/4959; see 5 above) culminates in an honours dissertation. The dissertation will be evaluated by a committee consisting of the dissertation supervisor and two other faculty members. An oral presentation may be required, at the discretion of the relevant co-ordinator/programme chair/head.

Academic Standing

To graduate with an honours degree in Environmental Science (Biology or Chemistry stream) the student must meet the academic standards for an honours Bachelor of Science degree at Memorial University, that is, the student must obtain: (i) a grade of "B" or better, OR an average of 75% or higher (whichever is to the candidate's advantage) in the minimum number of courses in the relevant Environmental Science stream, excluding 1000 level courses but including any other Environmental Science core, stream or honours courses; and (ii) an average of at least 1.75 points on the total number of courses required for the degree.

Residence Requirements

To qualify for an honours degree in science, a candidate shall attend a recognized university or an equivalent institution

for at least seven semesters as a full-time student. Honours candidates transferring credits to Memorial University from other universities or equivalent institutions shall EITHER spend a minimum of four of the seven semesters as full-time students at Memorial University, and take a minimum of eight courses in their honours discipline OR take a minimum of twelve courses in their honours discipline as full-time students at Memorial University (whichever is to their advantage), PROVIDED that the total number of semesters spent as full-time students at this and other recognized universities or equivalent institutions will not be less than seven.

Table B.1. Sample Schedule for Courses Required to Complete the Biology Stream - General Degree, in which a student takes three lab science courses in the first year.

| YEAR | SEMESTER 1 | SEMESTER 2 |
|------|--|--|
| 1 | Biology 1001 Chemistry 1200 Physics 1200 Mathematics 1000 English 1000 | Biology 1002 Chemistry 1001 Physics 1201 Mathematics 1001 English 1001 |
| 2 | Biology 2600 Biology 2010 Chemistry 2300 Mathematics 2510 Elective 1 | Biology 2122 Environmental Science 2430 Mathematics 2511 Philosophy 2809 Elective 2 |
| 3 | Biology 3610 Environmental Science 3130 Geography 1000 Science 3000 Elective 3 | Biology 3041 Geography 2102 Environmental Science 2450 Science 3001 Elective 4 |
| 4 | Biology 4820 Biology 4360 Environmental Science 2370 Environmental Science 4950 Elective 5 | Environmental Science 4130 Environmental Science 4000 Environmental Science 4080 Political Science 3731 Elective 6 |

Table B.2. Sample of the Biology Stream - General Degree, in which a student takes two lab science courses in the first year.

| YEAR | SEMESTER 1 | SEMESTER 2 |
|------|--|---|
| 1 | Biology 1001 Earth Science 1000 Mathematics 1080 (or 1000) English 1000 Elective 1 | Biology 1002 Earth Science 1001 Mathematics 1081 (or elective) English 1001 Elective 2 |

| | | |
|---|--|---|
| 2 | Biology 2600 Chemistry 1200 Geography 1000 Environmental Science 2370 Elective 3 | Biology 2122 Biology 2010 Chemistry 1001 Geography 2102 Elective 4 |
| 3 | Biology 3610 Environmental Science 3130 Chemistry 2440 Mathematics 2510 Science 3000 | Biology 3250 Environmental Science 2371 Mathematics 2511 Science 3001 Elective 5 |
| 4 | Biology 4820 Biology 4360 Environmental Science 2450 Environmental Science 4950 Political Science 3731 | Environmental Science 4130 Environmental Science 4000 Environmental Science 4080 Philosophy 2809 Elective 6 |

Table B.3. Sample of the Biology Stream - Honours Degree.

| YEAR | SEMESTER 1 | SEMESTER 2 |
|------|--|--|
| 1 | Biology 1001 Earth Science 1000 Geography 1000 Mathematics 1000 English 1000 | Biology 1002 Earth Science 1001 Geography 2102 English 1001 Elective 1 |
| 2 | Biology 2600 Chemistry 1200 Environmental Science 2370 Mathematics 2510 Elective 2 | Biology 2122 Biology 2010 Chemistry 1001 Mathematics 2511 Philosophy 2809 |
| 3 | Biology 3610 Environmental Science 3130 Chemistry 2440 Environmental Science 2450 Science 3000 | Biology 3250 Environmental Science 2371 Political Science 3731 Science 3001 Elective 3 |
| 4 | Biology 4820 Biology 4360 Environmental Science 4080 Environmental Science 4950 Elective 4 | Biology 4309 Biology 4505 Environmental Science 4130 Environmental Science 4000 Environmental Science 4959 |

Table B.4 Sample of the Chemistry Stream - General Degree.

| YEAR | SEMESTER 1 | SEMESTER 2 |
|------|--|--|
| 1 | Chemistry 1200 Physics 1200 Mathematics 1000 English 1000 Elective 1 | Chemistry 1001 Physics 1201 Mathematics 1001 English 1001 Elective 2 |

| | | |
|---|--|---|
| 2 | Chemistry 240A Chemistry 2300 Environmental Science 2370 Biology 1001 Elective 3 | Chemistry 240B Chemistry 2210 Environmental Science 2261 Biology 1002 Elective 4 |
| 3 | Environmental Science 3210 Environmental Science 3260 Mathematics 2510 Geography 1000 Science 3000 | Environmental Science 3261 Philosophy 2809 Biology 2600 Science 3001 Elective 5 |
| 4 | Environmental Science 3210 Environmental Science 4240 Environmental Science 4080 Environmental Science 2450 Elective 6 | Environmental Science 3211 Environmental Science 4000 Environmental Science 4950 Geography 2195 Anthropology 3083 |

Note: It is strongly recommended that students select Earth Science 1000 and Geography 2195 as two of their electives.

Table B.5. Sample of the Chemistry Stream - Honours Degree.

| YEAR | SEMESTER 1 | SEMESTER 2 |
|------|--|--|
| 1 | Chemistry 1200 Physics 1200 Mathematics 1000 English 1000 Elective 1 | Chemistry 1001 Physics 1201 Mathematics 1001 English 1001 Elective 2 |
| 2 | Chemistry 240A Chemistry 2300 Biology 1001 Mathematics 2510 Philosophy 2809 | Chemistry 240B Chemistry 2210 Biology 1002 Environmental Science 2261 Elective 3 |
| 3 | Environmental Science 3210 Environmental Science 3260 Biology 2600 Science 3000 Elective 4 | Environmental Science 3211 Environmental Science 3261 Anthropology 3083 Science 3001 Elective 5 |
| 4 | Environmental Science 4230 Environmental Science 4240 Environmental Science 2370 Environmental Science 4950 Environmental Science 4080 | Environmental Science 4239 Environmental Science 4249 Environmental Science 4000 Environmental Science 4959 Environmental Science 2371 |

Note: It is strongly recommended that students select Earth Science 1000 and Geography 2195 as two of their electives.

COURSE LIST

NEW COURSE NUMBERING

For existing MUN courses, the numbers remain the same. For new courses in Environmental Science, the following 4-digit scheme is used:

1st digit = Year

2nd digit = Parent Discipline:

0 = Multidisciplinary
1 = Biology
2 = Chemistry
3 = Earth Science
4 = Physics
9 = Project

3rd digit = Subdiscipline:

| (Biology) | (Chemistry) | (Multidisciplinary) |
|-------------|-------------------|---------------------|
| 1 = Botany | 1 = Analytical | 5 = Research |
| 2 = Zoology | 2 = Inorganic | 8 = Science Writing |
| 3 = Ecology | 3 = Physical | |
| | 4 = Organic | |
| | 6 = Environmental | |

4th digit = Numerical Sequence.

= 9 for 4000 level courses that are requirements of the Honours streams.

Courses specifically designed for the environmental science programme(s) are given the designation "EnSc". Thus, for example, in the Winter semester of the 2nd year, Environmental Chemistry is offered, with a course number = EnSc 2261.

ENVIRONMENTAL BIOLOGY COURSES

3130. Freshwater Ecology. The study of freshwater ecosystems (lakes, rivers, streams, peatlands). Included are abiotic components, community structures, energy flow, biogeochemical cycles, and the evolution of natural and altered aquatic ecosystems. Emphasis will be placed on field and laboratory studies of the ecology of freshwater organisms and systems in western Newfoundland.

Prerequisites: Biology 2010, 2122, 2600; Chemistry 1001.

Lectures: Three hours per week.

Laboratory: Three hours per week.

4130. Plant Physiological Ecology. A study of the physiological responses of plants to changes in the physical/chemical environment. Field studies of native species in stressful environments are emphasized. Topics include: environmental monitoring, photosynthetic gas exchange, water relations, nutrient relations, and stress physiology.

Prerequisites: Biology 2010, 2600, 3610.
Lectures: Three hours per week.
Laboratory: Three hours per week.

ENVIRONMENTAL CHEMISTRY COURSES

2261. Survey of Environmental Chemistry. Introduction to environmental problems, underlying chemistry and approaches to pollution prevention. Stratospheric chemistry and the ozone layer. Ground level air pollution. Global warming and the Greenhouse Effect. Toxic organic chemicals (TOC's), including herbicides, pesticides. Toxicology of PCB's, dioxins and furans. Chemistry of natural waters. Bioaccumulation of heavy metals. Energy production and its impact on the environment, including nuclear energy, fossil fuels, hydrogen. Prerequisites: Chemistry 1001.
Lectures: Three hours per week.

3210. Environmental Analytical Chemistry I. Treatment of data, error analysis, wet methods of analysis of laboratory and field samples. Volumetric methods for acidity, alkalinity and hardness; chemical and biological oxygen demand (COD and BOD). Gravimetric methods for sulphate and phosphates. Theory and application of specific ion electrodes analysis of metal ions, dissolved gases and halide ions. Turbidimetric and nephelometric measures of water quality. Spectrophotometric analysis of trace metal ions. Prerequisites: Chemistry 2300.
Lectures and Laboratory: Not more than seven hours per week.

3211. Environmental Analytical Chemistry II. Theory and application of spectroscopic methods of analysis (including error analysis) of environmentally important compounds. Spectrophotometric, FTIR, light scattering, chromatographic (GC, GC/MS, HPLC), fluorescence, phosphorescence, atomic absorption and electroanalytical methods will be studied. Synthetic laboratory samples and field samples will be examined by these techniques. Prerequisites: Environmental Science 3210 (or equivalent).
Lectures and Laboratory: Not more than six hours per week.

3260. Industrial Chemistry. Chemical principles used in the manufacture of inorganic and organic chemical products; electrochemical, petrochemical, polymer, pulp and paper, agricultural, cement, cosmetics, detergent and paint industries. Processes, specific pollutants of current interest: inorganic (e.g. mercury, NOX and SOX gases, lead etc.) and organic (e.g. PCB's, chlorinated hydrocarbons, freons, pesticides/herbicides). Industrial sources and analytical methods of detection will be studied. Prerequisites: Chemistry 2210, 240B, 2261.
Lectures: Three hours per week.

3261. Atmospheric Chemistry. Electronic, vibrational and rotational spectroscopy. Rates and mechanisms of gas phase reactions (particularly photochemical). Thermodynamics of the atmosphere. Formation, evolution and structure of the Earth's

atmosphere. Chemical and physical properties of the atmospheric gases. Global element cycles. The stratosphere and ozone variability. The ionosphere. Atmospheric pollutants. Problems of the "greenhouse" gases. Aerosol chemistry. Wet and dry deposition.

Prerequisites: Chemistry 2300, 2210.

Lectures: Three hours per week.

4230. Aquatic Chemistry I. Thermodynamics and kinetics of model systems. Acids and bases (including buffer intensity and neutralizing capacity), dissolved gases, precipitation and dissolution. Metal ions in aqueous solution. Redox control in natural waters. Pourbaix diagrams. Regulation of chemical composition of natural waters, pollution and water quality.

Prerequisites: Chemistry 2300.

Lectures and Laboratory: Not more than six hours per week.

4239. Aquatic Chemistry II. Heterogeneous aspects of aquatic chemistry. Surface chemistry of oxides, hydroxides and oxide minerals. Aggregation of colloids and the role of coagulation in natural waters. The oil-water interface. Inorganic and organic complexes in natural waters and problems of specificity.

Prerequisites: Environmental Science 4230.

Lectures and Laboratory: Not more than six hours per week.

4240. Organic Chemistry of Biomolecules. Structure and properties of carbohydrates, proteins, lipids, steroids, DNA and RNA. The chemistry of the cell in relation to its toxicology; effects of bioactive agents on cells, organelles, tissues and whole organisms. Natural products including those from the rain forest and marine environments. The role of metal ions in biomolecules. Examples of biosynthesis. Chemistry and mechanisms of mutagenesis and carcinogenesis.

Prerequisites: Chemistry 240B.

Lectures: Three hours per week.

OTHER ENVIRONMENTAL SCIENCE COURSES

2370. Global Environmental Change. A survey of the Earth as a dynamic system. Discussion of interacting cycles that define the Earth's environment. Material cycles and energy concepts. Evolution of the atmosphere in response to lithospheric, biospheric and hydrospheric changes. Major global environmental changes from Earth's formation to present. Emphasis on self-regulating ability of the Earth system.

Lectures: Three hours per week.

Prerequisite: This course is restricted to students with ten credits or more.

2371. Oceanography. Historical review of science of oceanography. Earth and Earth systems (including plate tectonics). Marine sediments and sedimentary environments. Chemical and physical properties of seawater. The atmosphere and the oceans, ocean circulation. Waves and tides, coastal environments, distribution of organisms. Applied

oceanography.

Lectures: Three hours per week.

Prerequisite: This course is restricted to students who have completed ten credits or more.

2430. Energy and the Environment. Energy, energy conversion, heat transfer, the laws of thermodynamics, nuclear processes and radiation will be treated. Practical problems such as the energy shortage, human influences on climate, resource extraction, nuclear power etc. will be discussed.

Prerequisites: Mathematics 1081 or 1000; Physics 1201

Lectures: Three hours per week.

2450. Meteorology. Meteorology as an application of physics and mathematics to the study of the atmosphere. Atmospheric motion on the global, synoptic, meso- and micro-scales. An introduction to atmospheric radiation and thermodynamics, clouds and precipitation. Vertical soundings and the analysis and interpretation of surface and upper-air weather maps.

Prerequisites: Physics 1201.

Lectures: Three hours per week.

4000. Environmental Science Seminar. Current topics in environmental science are reviewed and discussed in a seminar format. Normally, students will research and present two seminars relevant to environmental themes agreed upon by the students and the instructor(s). Seminars will also be presented on current research and environmental issues by faculty and guest speakers from universities, government and industry.

Prerequisite: This course is restricted to students who have completed 30 credits or more.

4080. Computer-Based Scientific Writing. Scientific English including vocabulary, structure, style and bibliography as used in standard scholarly journals and texts will be taught, with emphasis on the use of microcomputers in scientific word processing. Use will be made of commercial software for the production of scientific documents incorporating chemical structures, mathematical formulae, spectral plots and graphs. Instruction will be given in the manipulation of scanned images and spectral plots as well as spreadsheet usage for data manipulation and graphical display. Databases for information storage and retrieval will also be explored, together with on-line searching strategies, including key-word and citation methodologies.

Lectures and Laboratory: Not more than six hours per week.

Prerequisite: This course is restricted to students who have completed 30 credits or more.

4950. Research Project in Environmental Science I. With the guidance of a faculty member, students will conduct a scientific study based upon original research or a critical review of extant data in an appropriate area. Students are required to present both a thesis and a seminar on their research.

Prerequisite: Permission of Coordinator.

Note: This project fulfils the Core requirement for a fourth-year individual project in the area of specialization.

4959. Research Project in Environmental Science II. This is a continuation of Environmental Science 4950 specifically for Honours students. Under the supervision of a faculty member, students will carry out an original research project in environmental science. Students will present both a thesis and seminar on their research (One dissertation and one seminar satisfies the requirements for both Environmental Science 4950 and 4959).

Prerequisite: Environmental Science 4950.

Note: This course is restricted to honours candidates.

OTHER COURSES

Political Science 3731. Environmental Policy. An examination of the formation, implementation, and impact of public policies concerning the environment including an examination of different policy approaches and the problems of environmental regulation.

Prerequisites: None.

Lectures: Three hours per week."

49.1 Related Calendar Changes to the Core Programme

Page 71, 1994-95 Calendar, following the heading General Regulations delete the sub-heading "The Bachelor of Arts Degree Programme" and the paragraph "For the Bachelor of Arts...Specialization requirements." and replace with the following:

"THE BACHELOR OF ARTS AND BACHELOR OF SCIENCES DEGREE PROGRAMMES

For the Bachelor of Arts and Bachelor of Science degrees at Grenfell College students must complete forty courses subject to the Core Programme and Specialization requirements."

Following the heading Core Programme Rationale amend paragraph three to read as follows:

"The Core includes a Literacy Requirement, a Numeracy Requirement, a Scientific Concepts and Issues Requirement and a General Education Requirement...technology. The Scientific Concepts and Issues Requirement is intended to ensure that students have a grasp of important concepts and discoveries in science as well as an understanding of issues that arise out of scientific endeavor."

Page 72, following the heading 1. Core Programme Requirements amend c) to read as follows:

"c) Science Concepts and Issues

Science 3000 and 3001".

Following the heading Explanatory Notes: delete note 3 and renumber current 4 and 5 as 3 and 4, respectively.

Page 73, before the heading Specialization in English Language and Literature insert the following new heading:

"BACHELOR OF ARTS DEGREE PROGRAMMES".

Page 74, following the heading Requirements for a Specialization in Psychology insert the following new heading:

"BACHELOR OF SCIENCE PROGRAMME".

Page 72, following the heading 4. Waiver of Requirements and before the sentence "In special circumstances..." insert the following:

"Course prerequisites may be waived by co-ordinators/heads/programme chairs of the disciplines in question."

Page 71, following the heading Core Programme Rationale delete the word "receive" in paragraph two, second sentence and replace with the following:

"acquire".

49.2 New Visual Arts Computer Courses - Bachelor of Fine Arts (Visual Arts) Programme

Page 90, 1994-95 Calendar, following the heading Bachelor of Fine Arts (Visual Arts) amend the second sentence of paragraph one to read as follows:

"Courses are offered in Drawing, Painting, Sculpture, Printmaking, Photography, Multi-media, Digital Imaging, Digital Multimedia and Art History."

Page 91, following the heading Degree Regulations amend clause 5 to read as follows:

- "5. Three of a, b, c, d, e.
a) Visual Arts 2100 and 2101
b) Visual Arts 2200 and 2201
c) Visual Arts 2310 and 2311, or 2320 and 2321
d) Visual Arts 2400 and 2401
e) Visual Arts 2600 and 2601".

Following the heading Degree Regulations, subheading Programme, Year 2 insert the following after "Three of" but before "Two Art History Courses":

"Introductory Digital Imaging I, II (2600, 2601)".

Page 92, following the heading Studio Courses amend the first sentence to read as follows:

"Studio courses are offered in the following subjects:
Drawing, Two-dimensional design, Three-dimensional design,
Painting, Sculpture, Printmaking, Photography, Multi-media,
Digital Imaging and Digital Multimedia."

Following the heading Course Descriptions, sub-heading 2nd
Year add the following new courses:

"2600. Introductory Digital Imaging I. An introduction to
the computer as an art-making tool. Computer basics.
Creation, acquisition, manipulation and output of digital
images using several computer applications.

2601. Introductory Digital Imaging II. A continuation of the
work done in Visual Arts 2600. Students will learn how to
create original artworks directly on the computer and how to
incorporate images from other sources using a color scanner.
The ethics, aesthetics and theory of digital image-making for
artists will also be addressed.

Following the heading Course Descriptions, sub-heading 3rd
Year add the following new courses:

"3510. Digital Multimedia I. An exploration of computer-
based multi-medial production on the computer involving 2-D
and 3-D graphics, animation, video, sound and text.

3511. Digital Multimedia II. A continuation of the work
begun in Visual Arts 3510. Students will learn how to create
original artworks directly on the computer and how to
incorporate still images, moving images, sound and text using
a color scanner, video camera, video cassette recorder, midi
devices, etc. The ethics, aesthetics and theory of digital
multimedia production for artists will also be addressed."

49.3 Information About the Development of a New Curriculum for the Undergraduate Programme in Nursing

A memorandum dated February 17, 1995, was received from the
Senate Committee on Undergraduate Studies forwarding
information from the School of Nursing regarding the
development of a new curriculum for the undergraduate
programme in Nursing.

This item was received for information.

Report of the Academic Council of the School of Graduate
Studies

49.4 Department of Computer Science

Page 411, 1994-95 Calendar, following the heading
Applications delete the number "CS6758,59" and replace with
"CS6758 - 6769".

49.5 Revision to General Regulation G.1.B.

Page 367, 1994-95 Calendar, following the heading G.
Evaluation amend 1b) to read as follows:

"b) A written copy of the course outline, including method of evaluation in the course shall be provided to each student in the course...".

49.6 Constitution of the School of Music

It was moved by Dr. Volk, seconded by Dr. Kealey and carried that amendments to the Constitution of the School of Music be approved for submission to the Board of Regents.

ADDENDUM TO AGENDA

49.7 STUDENT APPEAL TO SENATE

MUN NO. 9244542

Following the normal appeals process, this student's appeal that she be readmitted to the University for the Winter Semester, 1995, was denied by the Executive Committee of Senate at a meeting held on February 24, 1995. The student subsequently requested that her appeal be heard by Senate.

Following consideration, it was moved by Mr. McCartney, seconded by Dr. Skanes and carried that this student's appeal be UPHELD.

MUN NO. 9244542

It was then moved by Dr. Sharpe, seconded by Dr. Kealey and carried, that the second required withdrawal should remain on the student's transcript.

49.8 Report of the Senate Committee on Committees

It was agreed to approve a recommendation from the Senate Committee on Committees that Dr. Barbara Neis, Department of Sociology be appointed to replace Dr. Laurel Duquette on the Senate Research Committee during the period of Dr. Duquette's leave.

49.9 Student Representative

The Council of the Students' Union at Sir Wilfred Grenfell College has advised that Scott Barter has resigned his position on Senate and has been replaced by Darren Balsom.

50. ADJOURNMENT

The meeting adjourned at 9:10 p.m.