

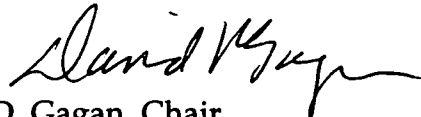
S.95-70

SIMON FRASER UNIVERSITY

MEMORANDUM

To: Senate

From:


D. Gagan, Chair
Senate Committee on
Academic Planning

Subject: Curriculum Revisions
Faculty of Science

Date: November 10, 1995

Action undertaken by the Senate Committee on Undergraduate Studies and the Senate Committee on Academic Planning gives rise to the following motion:

Motion:

"that Senate approve and recommend approval to the Board of Governors the curriculum revisions for the Faculty of Science as set forth in S.95 - 70 as follows:

- S.95 - 70 a Department of Biological Sciences
- S.95 - 70 b Earth Sciences Program
- S.95 - 70 c Department of Mathematics and Statistics
- S.95 - 70 d Department of Physics"

In all cases agreement has been reached between the Faculty and the Library in the assessment of library costs associated with new courses.

S.95-70 a

Department of Biological Sciences

SCUS Reference: SCUS 94 - 18 a
SCAP Reference: SCAP 95 - 60 a

New courses: BISC 307-3 Animal Physiology Laboratory
BISC 367-3 Plant Physiology Laboratory

For Information:

Acting under delegated authority of Senate, SCUS has approved the following revisions as detailed in SCUS 94 - 18 a:

BISC 305 Change of vector
BISC 366 Change of title and vector

**SIMON FRASER UNIVERSITY
DEPARTMENT OF BIOLOGICAL SCIENCES****MEMORANDUM**

To: FSUCC

From: Michael J. Smith, Chair

Subject: calendar changes

Date: 9/28/95

The Department of Biological Sciences is currently reviewing its undergraduate program, with the goal to offer students better possibilities to specialize in different fields of biology. Resulting program changes must also take into account the dramatically increased number of biology majors we had to admit during the last two years. These students are now entering upper division courses, and with our current structure and budget we are no longer able to admit all students to required courses in a timely manner.

The most serious limitations we anticipate are in BISC 305 (Animal Physiology) and BISC 366 (Plant Ecophysiology). Under the current structure, every biology student is required to take one of these two courses. Both are intensive lecture and laboratory courses, and the enrollment is therefore limited. While we find a physiology course important for all students, it is clear that many students specializing in other areas do not require the laboratory component of these courses. Moreover, the current vector (3-0-4) does not allow enough time in the lecture component to cover both the whole field of physiology systematically and focus on the particular experiments as well. Therefore, we propose to take the laboratory part out of these courses, and offer it separately as an optional course. These changes will be consistent with more general curriculum changes that will be forwarded later, but it is essential to implement them in the next academic year so that students can fulfill their required course work.

Especially for BISC 366, "Plant Ecophysiology", we propose a name change to "Plant Physiology", in reflection of the changed emphasis in this field.

enclosures: course proposal forms



SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Biological Sciences

Abbreviation Code: BISC Course Number: 307 Credit Hours: 3 Vector: 1-1-4

Title of Course: Animal Physiology Laboratory

Calendar Description of Course:

A laboratory course using contemporary techniques of animal physiological research

Nature of Course: laboratory course

Prerequisites (or special instructions): BISC 305

What course (courses), if any, is being dropped from the calendar if this course is approved?
lab component is removed from BISC 305

2. Scheduling

How frequently will the course be offered? once or twice per year

Semester in which the course will first be offered? 97-2

Which of your present faculty would be available to make the proposed offering possible?

Delaney, Williams

3. Objectives of the Course

To teach animal physiology in practical laboratory experiments and to introduce the student to modern experimental techniques used in this field

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas?

Faculty: none

Staff: none

Library: none

Audio Visual: none

Space: none

Equipment: none

5. Approval

Date 10/2/95



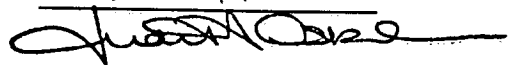
Department Chair

Oct 19 95



Dean

Nov 9/95



Chair SCUS

SCUS 73-74b: (When competing this form, for instructions see Memorandum SCUS 73-74a.)

Sample outline: BISC 307 Animal Physiology Laboratory

Prerequisite: BISC 305

The lecture and tutorial component of this course introduce and reinforce the theoretical aspects of the laboratory in order to enhance understanding of the laboratory exercises and increase the level of sophistication of the exercises which can be undertaken. Included in this instruction are computer based simulations and computer assisted data analysis techniques relevant to physiological investigations.

The laboratory consist of 8-10 experiment-based exercises designed to explore general principles of organ and tissue physiology. Students will work semi-independently in groups of 2-3 to complete one or two "investigations" which illustrate general principles of physiological function with a component of the exercise designed to require independent investigation and thought. Formal reports on each exercise will be required and account for approximately 70% of the mark for the course. 30% of the course mark will derive from examinations on practical and theoretical aspects of the subject material.

- Experiment 1 Regulation of cellular ion balance and function of transport epithelia
- Experiment 2 Electrical properties of nerves and neurons
- Experiment 3 Principles of function of sensory receptors--mechano and photoreceptors used to illustrate principles of rate coding, discrimination, and sensory preprocessing
- Experiment 4 Excitation contraction coupling in smooth and skeletal muscle
- Experiment 5 Mechanical properties of muscle, length tension relationships, work and fatigue
- Experiment 6 Regulation of cardiac function by autonomic nervous system, electrical and mechanical properties of blood pumping
- Experiment 7 Metabolism, effects of temperature and environmental stress on metabolic function.
- Experiment 8 Hormonal regulation: regulation of development during insect metamorphosis
- Experiment 9 Enzymatic activity, role of isozymes in adaptation and function of specific organs using the lactic acid dehydrogenase system of liver, heart and skeletal muscle
- Experiment 10 To be decided

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Biological Sciences

Abbreviation Code: BISC Course Number: 367 Credit Hours: 3 Vector: 1-1-4

Title of Course: Plant Physiology Laboratory

Calendar Description of Course:

A laboratory course using contemporary techniques of plant physiological research

Nature of Course: laboratory course

Prerequisites (or special instructions): BISC 366

What course (courses), if any, is being dropped from the calendar if this course is approved?
lab component is removed from BISC 366

2. Scheduling

How frequently will the course be offered? once or twice per year

Semester in which the course will first be offered? 97-2

Which of your present faculty would be available to make the proposed offering possible?

Lee, Plant, Kermod, Lister

3. Objectives of the Course

To teach plant physiology in practical laboratory experiments and to introduce the student to modern experimental techniques used in this field

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas?

Faculty: none

Staff: none

Library: none

Audio Visual: none

Space: none

Equipment: none

5. Approval

Date 10/2/95

[Signature]

Department Chair

Oct. 19 95

[Signature]

Dean

Nov. 9/95

[Signature]

Chair SCUS

SCUS 73-74b: (When completing this form, for instructions see Memorandum SCUS 73-74a.)

Sample outline: BISC 367 Plant Physiology Laboratory

Prerequisite: BISC 366

The lecture and tutorial component of this course introduce and reinforce the theoretical aspects of the laboratory in order to enhance understanding of the laboratory exercises and increase the level of sophistication of the exercises which can be undertaken.

The laboratory consist of 7-8 experiment-based exercises designed to explore general principles of plant physiology. Students will work semi-independently in groups of 2-3. Formal reports on each exercise will be required and account for approximately 70% of the mark for the course. 30% of the course mark will derive from examinations on practical and theoretical aspects of the subject material.

Experiment 1 Analysis of plant tissues

Experiment 2 Protein extraction from plant tissues

Experiment 3 Effect of growth regulators on growth and development

Experiment 4 Effect of light regimes on growth and development

Experiment 5 Monitoring environmental stress

Experiment 6 Separation of plant organelles

Experiment 7 Application of plant physiology research

Experiment 8 To be decided

Earth Sciences Program

SCUS Reference: SCUS 94 - 18 c
SCAP Reference: SCAP 95 - 60 b

Revised Calendar entry for Earth Sciences Program

New courses:

- EASC 207-3 Introduction to Geophysics
- EASC 301-3 Igneous and Metamorphic Petrology
- EASC 302-3 Sedimentary Petrology
- EASC 303-3 Environmental Geoscience
- EASC 304-3 Structural Geology II
- EASC 305-3 Regional Geology of Western Canada
- EASC 306-3 Field Geology II
- EASC 307-3 Applied Geophysics
- EASC 308-3 Low Temperature Geochemistry
- EASC 401-3 Mineral Deposits
- EASC 402-3 Sedimentology
- EASC 403-3 Quaternary Geology
- EASC 404-3 Subsurface Methods for Environmental Geoscience
- EASC 405-3 Basin Analysis
- EASC 406-3 Field Geology III
- EASC 409-3 Rivers: Environments and Engineering
- EASC 490-3 Undergraduate Seminar
- EASC 491-1 Directed Readings
- EASC 492-2 Directed Readings
- EASC 493-3 Directed Readings
- EASC 499-9 Honours Thesis

**SIMON FRASER UNIVERSITY
MEMORANDUM**

To: R. Heath
Secretary to Senate

From: C.H.W. Jones, Dean
Faculty of Science

Subject: **Earth Sciences**

Date: October 18, 1995

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The financial resources required to allow the mounting of the full Earth Sciences programme have been approved through the Academic Enhancement Fund.


- The faculty complement is currently made up of Drs. Hickin and Roberts (joint appointments with Geography) and Drs. McEachern, Mustard and Thorkelson.

Four more faculty appointments will be made over the next three years, three from AEF and one from the Faculty of Science.

- The T.A., Operating and Library budgets are also provided for under the AEF.

With regard to space considerations:

- Office space for the programme has been identified within the Faculty of Science allocation. The space currently occupied by the Academic Resources Centre will be converted for this purpose.
- The programme currently has access to one undergraduate teaching laboratory C9015. The Associate Vice President Academic, J. Osborne, has approved the allocation of appropriate space in the Shrum Classroom Building over the next two years for three additional teaching laboratories.
- Faculty now have access to room 7658 in the Shrum Classroom Building for research purposes and one more room in the Shrum Classroom Building has been allocated by the Associate Vice President for research purposes for Earth Sciences.


C.H.W. Jones

CHWJ:rh:Encl.

- c. M.C. Roberts, Director
Earth Sciences Program

SIMON FRASER UNIVERSITY
EARTH SCIENCES PROGRAM



MEMORANDUM

TO: M. Plischke, Chair FSUGCC
SUBJECT: Changes to Earth Science Curriculum

FROM: Mike Roberts
DATE: 14 September 1996

Please find enclosed for your committee's approval the course proposal forms and course outlines for the third and fourth years of the Earth Sciences Program. In addition, there is a course proposal for a second year Geophysics course, which was not part of lower level courses approved earlier.

A revised Calendar entry is also submitted for your approval.

cc: Admin. Asst.

Mike Roberts

CALENDAR ENTRY

Director: M.C.Roberts
8103 South Science Building
(604) 291 - 4657

Professors

E.J. Hickin BA, PhD (Syd), P.Geo
M.C. Roberts BSc (Lond), MA (Tor), PhD (Iowa), P.Geo

Assistant Professors

J.A. MacEachern BSc, MSc (Regina), PhD (Alberta)
P. Mustard BSc (Calgary), MSc, PhD (Carleton), PGeo
D. J. Thorkelson BSc, MSc (UBC), PhD (Carleton)

Laboratory Instructor

R. Dunlop BSc (Calgary), MSc (UBC)

The Earth Sciences Program is a new academic unit which began offering BSc and BSc (Honours) degrees in geoscience in September 1995. Some of the 300 and 400 level courses will be offered in 1995 - 96.

Major Program

Lower Division Requirements

(57 semester hours)

BISC	100-4	Introduction to Biology
CHEM	102-3	General Chemistry I
	103-3	General Chemistry II
	115-2	General Chemistry Laboratory
EASC	101-3	Physical Geology
	102-3	Historical Geology
	201-3	Stratigraphy and Sedimentation
	202-3	Introduction to Mineralogy
	203-3	Paleontology
	204-3	Structural Geology I
	205-3	Introduction to Petrology
	206-1	Field Geology I

	207-3	Introduction to Geophysics
GEOG	213-3	Geomorphology I
MATH	151-3	Calculus I
	152-3	Calculus II
PHYS	120-3	General Physics I
	121-3	General Physics II
	131-2	General Physics Laboratory
STAT	101-3	Introduction to Statistics

Upper Division Requirements

Third Year Requirements

(29 semester hours)

EASC	301-3	Igneous and Metamorphic Petrology
	302-3	Sedimentary Petrology
	303-3	Environmental Geoscience
	304-3	Structural Geology II
	305-3	Regional Geology of Western Canada
	306-2	Field Geology II
	307-3	Applied Geophysics
GEOG	311-3	Hydrology
	313-3	Geomorphology
	317-3	Soil Science

Fourth Year Requirements

In the fourth year students must complete EASC 406-3, 490-0 and six additional 400 level Earth Science courses (21 semester hours in total) from those listed below

EASC	401-3	Mineral Deposits
	402-3	Sedimentology
	403-3	Quaternary Geology
	404-3	Subsurface Methods for Environmental Geoscience
	405-3	Basin Analysis
	406-3	Field Geology III
	407-3	Tectonics
	408-3	Hydrogeology

409-3 Rivers: Environments & Engineering
490-0 Undergraduate Seminar

Students who intend to apply for registration with APEGBC should be aware of the fact that they may have to take some additional courses not required by the major in order to meet APEGBC requirements (further advice should be obtained from the Earth Sciences Program).

Honours Program

This program is the same as the major program except that it must include a minimum of 60 semester hours of 300 - 400 level courses in the Earth Science Program and related programs. A student must complete a total of 132 semester hours of credit; the completion of an honours thesis is an option. Entry into the program requires a cumulative grade point average of 3.00 or higher and permission of the Earth Sciences Program.

Earth Sciences Minor Program

Candidates for a minor in Earth Sciences are required to take the following courses:

EASC 101-3 Physical Geology
102-3 Historical Geology

at least three of

EASC 201-3 Stratigraphy and Sedimentation
202-3 Introduction to Mineralogy
203-3 Paleontology
204-3 Structural Geology
205-3 Introduction to Petrology
207-3 Introduction to Geophysics

plus 15 hours of any 300 and 400 level Earth Sciences courses excluding EASC 490, 491, 492, 493.

Co-operative Earth Sciences Program

The Earth Sciences Program will start offering, in the Fall of 1996, a Co-operative Education program for majors and honours students in Earth Sciences. Students must have completed 30 semester hours with a minimum cumulative grade point average of 2.75. Prior to admission, students must complete the following:

	EASC	101-3	Physical Geology
		102-3	Historical Geology
Three of	EASC	201-3	Stratigraphy and Sedimentation
		202-3	Introduction to Mineralogy
		203-3	Paleontology
		204-3	Structural Geology
		205-3	Introduction to Petrology
		207-3	Introduction to Geophysics
	GEOG	213-3	Introduction to Geomorphology

College transfer students should consult the Co-operative Education section in this calendar (p.172) for eligibility requirements.

Professional Registration as a B.C. Geoscientist

The right to practice in, and to accept professional responsibility for geoscience in B.C. is limited to those who are registered members of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC). Requirements for registration can be met through the Earth Science Program and selected courses in other university departments. Students interested in professional registration should consult the Director for further details.

SIMON FRASER UNIVERSITY
EARTH SCIENCES PROGRAM



MEMORANDUM

TO: M. Plischke, Chair FSUGCC
SUBJECT: Course Proposal Forms

FROM: Mike Roberts
DATE: 15 September 1996

In the 'New Course Proposal Form' under item 4 (Budgetary and Space Requirements) there are several requirements listed and we have inserted the phrase -'See attached memo' for two of them.

SPACE

The laboratory space requirements for these courses will be met by the teaching laboratory (C 9015) that was assigned to us by the Dean. This is a laboratory completely dedicated to the Earth Sciences Program.

The Dean has also assigned us offices and a research laboratory for the new faculty.

EQUIPMENT

As part of the Academic Enhancement Fund budget monies were set aside for the purchase of equipment. Our most expensive item - 15 microscopes for the Mineralogy and Petrology laboratory sections - have already been purchased. In short, equipment expenses for these courses have been accommodated in our budget and budget planning.

Mike Roberts

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **207** Credit Hrs: **3** Vector: **2-0-2**
Title of Course: **Introduction to Geophysics**
Calendar Description of Course: **An introduction to geophysics emphasizing seismic, magnetic and gravimetric observations of the Earth. Applied geophysics.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **Completion of EASC 101 and PHYSICS 121**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered?
Once every 3 semesters
Semester in which the course will first be offered?
96-3
Which of your present faculty would be available to make the proposed offering possible?
New faculty
3. Objectives of the Course: **To provide a foundation course in geophysics for the Earth Sciences Program. This course fulfills an APEGBC requirement.**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
- | | |
|--------------|---|
| Faculty | None beyond already authorized faculty |
| Staff | None beyond already authorized staff |
| Library* | None |
| Audio Visual | None |
| Space | See attached memo |
| Equipment | See attached memo |

5. Approval

Date:	<u>Sept 14 / 95</u>	<u>19 Oct 95</u>	<u>Nov. 9 / 95</u>
	<u>Michael Roberts</u>	<u>CHU. J. ONL.</u>	<u>Justin D. [Signature]</u>
	(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
INTRODUCTION TO GEOPHYSICS

General

EASC 207 is an introduction to geophysics with an emphasis on the near surface. The first part of the course will focus on the physics of various seismic, magnetic and gravimetric phenomena and the second part will deal with applied geophysics and surveying methods. Theoretical aspects will be developed in lectures and applied problems will be explored in laboratory classes.

Prerequisites

Completion of EASC 101 and PHYSICS 121

Course Topics

1. Seismic wave theory and seismic properties of the Earth.
2. Magnetic theory and magnetic properties of the Earth
3. Gravimetric theory and gravimetric properties of the Earth
4. Survey techniques: seismic, magnetic and gravimetric

Course Text

Telford, W.M., Geldart, L.P., Sheriff, R.E., & Keys, D.A., 1976. Applied Geophysics. Cambridge Univ. Press.

Course Grade

Grades will be based on the following components:

(a) Laboratory Assignments	: 20%
(b) Midterm theory Examination	: 40%
(e) Final theory examination	: 40%

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **301** Credit Hrs: **3** Vector: **2-0-2**
Title of Course: **Igneous and metamorphic petrology**
Calendar Description of Course: **Mineralogy, phase relations, origin of igneous rocks; classification of igneous rocks. Mineralogy and textures of metamorphic rocks; hand sample and thin sections.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **EASC 205**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**
2. Scheduling
How frequently will the course be offered?
Once a year
Semester in which the course will first be offered?
96-3
Which of your present faculty would be available to make the proposed offering possible?
D.J. Thorkelson
3. Objectives of the Course: **To provide an intermediate to advanced course in igneous and metamorphic petrology for majors in the Earth Sciences Program; the course will meet the 94-GL-B2 requirement of APEGBC.**
4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo.**
Equipment **See attached memo**

5. Approval

Date: <u>Sept 14/95</u>	<u>19 Oct 95</u>	<u>Nov. 9/95</u>
<u>Michael C Roberts</u>	<u>ATLSON</u>	<u>Justin Olson</u>
(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

COURSE OUTLINE
IGNEOUS AND METAMORPHIC PETROLOGY

General

EASC 301 is an intermediate to advanced course in igneous and metamorphic petrology, which builds on the foundation developed in EASC 205. Lectures will develop theory of genesis and classification and laboratory classes will focus on analytical techniques and identification.

Prerequisites

EASC 205

Course Topics

1. Review of principles of polarizing microscopy.
2. Overview of fundamentals: thermodynamics, kinetics, classification
3. Magmatic rocks & systems
 - Calalkaline - volcanic & plutonic
 - Subalkaline basaltic and ultramafic rocks
 - Alkaline rocks
 - Magma generation, diversification and ascent
4. Metamorphic rocks and systems
 - Petrography
 - Field relations
 - Fabric

Course Text

Best, M.G., 1982. Igneous and Metamorphic Petrology. W.H. Freeman.

Field-trip Fee

A fee will be collected to offset the cost of the EASC 301 field trip.

Course Grade

Grades will be based on the following components:

- | | |
|---------------------------------|-------|
| (a) Mid-term Theory examination | : 20% |
| (b) Laboratory Examination | : 20% |
| (c) Field trip report | : 20% |
| (d) Final theory examination | : 40% |

Enquiries

Further information about this course can be obtained from the Instructor, Professor EASC, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **302** Credit Hrs: **3** Vector: **2-0-2**
Title of Course: **Sedimentary petrology**
Calendar Description of Course: **Description and classification, field and microscopic identification of sedimentary rocks; petrogenesis and paleoenvironmental reconstruction.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **STAT 101 and EASC 205**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**
2. Scheduling
How frequently will the course be offered?
Once a year
Semester in which the course will first be offered?
97-3
Which of your present faculty would be available to make the proposed offering possible?
J. MacEachern and P. Mustard
3. Objectives of the Course: **To provide an intermediate to advanced course in sedimentary petrology for the Earth Sciences Program.**
4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **See attached memo**

5. Approval

Date:

Sept 14/95
Michael Coburn

(Department Chair)

19 Oct 95

Chris Jones

(Dean)

Nov. 9/95

[Signature]

(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
SEDIMENTARY PETROLOGY

General

EASC 302 is an intermediate to advanced course in sedimentary petrology. Lectures will develop theory of genesis and classification and laboratory classes will focus on analytical techniques and identification.

Prerequisites

STAT 101 and EASC 205

Course Topics

1. Review of depositional environments of clastic, chemical and organic rocks
2. Clastic rocks

Techniques : Mechanical analysis and statistical analysis
Optical methods
Sampling and preparation procedures
Mineralogical analysis
Sediments in thin section
Field identification

3. Chemical and organic rocks (carbonates and hydrocarbons)

Techniques : Mechanical analysis and statistical analysis
Optical methods
Sampling and preparation procedures
Mineralogical analysis
Sediments in thin section
Field identification

Course Text

Blatt, H., 1992. Sedimentary Petrology (2nd Edit.). W.H. Freeman.

Course Grade

Grades will be based on the following components:

- | | |
|---------------------------------|-------|
| (a) Mid-term theory examination | : 30% |
| (b) Laboratory examination | : 40% |
| (c) Final theory examination | : 30% |

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **303** Credit Hrs: **3** Vector: **2-0-2**
Title of Course: **Environmental Geoscience**
Calendar Description of Course: **Environmental geology is a branch of ecology which deals with the relationship of people to their geological habitat. Topics covered will include environmental impact of mineral extraction and logging; erosion and sedimentation in rural and urban environments; mass movements in mountainous terrain.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **75 credit hours including 6 credit hours in Earth Sciences.**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **Once every 6 semesters**
Semester in which the course will first be offered? **97-3**
Which of your present faculty would be available to make the proposed offering possible?
M.C. Roberts and a new faculty member

3. Objectives of the Course: **To provide an advanced course in geological analysis and assessment of the human use of the earth.**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **\$600 for maps and aerial photographs**

5. Approval

Date: Sept 14 / 95 19 Oct 95 Nov 9 / 95
Michael Roberts CHU Jones [Signature]
(Department Chair) (Dean) (Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
ENVIRONMENTAL GEOSCIENCE

General

EASC 308 is a broadly based course dealing with a wide range of applied geologic topics in a variety of human-modified environments.

Prerequisites

75 credit hours including 6 credit hours in Earth Sciences.

Course Topics

1. Limitations of earth resources.
2. Hazardous earth processes
 - Flooding
 - Landslides
 - Earthquakes
 - Volcanic activity
 - Coastal hazards
3. Human interaction with the geologic environment.
 - Hydrology and human use
 - Waste disposal
 - Geology and environmental health
4. Minerals, energy and environment
5. Geology and landuse planning
6. Terrain analysis and the forest industry

Course Text

Costa, J.E. and Baker, V.R., 1981, Surficial Geology: building with the Earth. Wiley, New York.

Field-trip Fee

A fee will be levied to offset the cost of the EASC 303 field trips.

Course Grade

Grades will be based on the following components:

- | | |
|------------------------------|-------|
| (a) Midterm Examination | : 25% |
| (b) Field Report | : 25% |
| (c) Final theory examination | : 50% |

Enquiries

Further information about this course can be obtained from the Instructor, Professor M.C. Roberts, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **304** Credit Hrs: **3** Vector: **2-0-2**
Title of Course: **Structural Geology II**
Calendar Description of Course: **Rheological behaviour of rock; theories of stress distribution; failure criteria for rock; the evaluation of bulk rock properties.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **EASC 204; PHYS 120 and PHYS 131**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **Every other year**
Semester in which the course will first be offered? **96-3**
Which of your present faculty would be available to make the proposed offering possible? **D.J. Thorkelson**

3. Objectives of the Course: **To provide an advanced course in the physics of rock deformation for the Earth Sciences Program.**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **See attached memo**

5. Approval

Date: <u>Sept 14/95</u>	<u>19 Oct 95</u>	<u>Nov 9/95</u>
<u>Michael Crobert</u>	<u>Chm. Jones</u>	<u>Justin Oake</u>
(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
STRUCTURAL GEOLOGY II

General

This is an advanced course in structural geology that builds on the material covered in EASC 204. Students must have completed their Physics requirement prior to taking this course.

Prerequisites

EASC 204; PHYS 121 and PHYS 131

Course Topics

- A Deformation physics
- B Structures
 - 1. Minor fractures
 - 2. Intrusions
 - 3. Faults: Strike slip, overthrust, normal
 - 4. Folding: single layer, multilayer
 - 5. Buckling & buckle folds
 - 6. Boudinage
 - 7. Rock cleavage
 - 8. Structural analysis

Course Text

Price, N.J., & Cosgrove, J.W., 1990. Analysis of Geological Structures. Cambridge University Press.

Field-trip Fee

A fee will be levied to offset the cost of the EASC 304 field trip.

Course Grade

Grades will be based on the following components:

(a) Laboratory Examination	: 40%
(b) Laboratory assignments	: 20%
(c) Field trip report	: 10%
(d) Final theory examination	: 30%

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **305** Credit Hrs: **3** Vector: **2-0-2**
Title of Course: **Regional geology of western Canada**
Calendar Description of Course: **The stratigraphy, structure and historical geology of western Canada. Terrane analysis. Important mineral and fossil sites will be discussed.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **EASC 201 and EASC 204**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **Once every 4 semesters**
Semester in which the course will first be offered? **97-1**
Which of your present faculty would be available to make the proposed offering possible? **P.Mustard and J.Monger**

3. Objectives of the Course: **To provide a an understanding of the geology of western Canada with emphasis on British Columbia.**

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty	None beyond already authorized faculty
Staff	None beyond already authorized staff
Library*	None
Audio Visual	None
Space	See attached memo
Equipment	See attached memo

5. Approval

Date: <u>Sept 14/95</u>	<u>19 08 95</u>	<u>Nov 9/95</u>
<u>Michael Coburn</u>	<u>Chm. Jones</u>	<u>John A. Dineen</u>
(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
REGIONAL GEOLOGY OF WESTERN CANADA

General

EASC 305 is a survey and synthesis of the geological environment of western Canada in the context of plate tectonic theory. Emphasis will be given to the accreted terranes of British Columbia and the Western Sedimentary Basin of Alberta and B.C..

Prerequisites

EASC 201 and EASC 204

Course Topics

1. Insular Belt
2. Coast Plutonic Complex
3. Intermontane Belt
4. Omineca Crystalline Belt
5. Rocky Mountain Belt
6. Western Sedimentary Basin

Course Text

None; course notes will be distributed in class.

Field-trip Fee

A fee will be levied to offset the costs (bus and lodging) of the EASC 305 field trip, and course notes.

Course Grade

Grades will be based on the following components:

- | | |
|------------------------------|-------|
| (a) Midterm examination | : 30% |
| (b) Final theory examination | : 50% |
| (c) Field trip report | : 20% |

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**

Abbreviation Code: **EASC** Course #: **306** Credit Hrs: **2** Vector: **0-0-2**

Title of Course: **Field Geology II**

Calendar Description of Course: **A 7-day field camp held after the finals week in the Spring Semester. The camp will focus on the field methods of logging, mapping and interpreting rocks in the field setting. Field locations will vary from year to year.**

Nature of Course: **Field study**

Prerequisites (or special instructions): **Completion of all required 3rd year Earth Science courses.**

What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling

How frequently will the course be offered? **Once every year**

Semester in which the course will first be offered? **97-1**

Which of your present faculty would be available to make the proposed offering possible? **All EASC faculty**

3. Objectives of the Course: **To provide a core course in field geology that covers the basic field methods used by geologists.**

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty **None beyond already authorized faculty**

Staff **None beyond already authorized staff**

Library* **None**

Audio Visual **None**

Space **See attached memo**

Equipment **See attached memo**

5. Approval

Date:

Sept 14/95
Michael Robus

(Department Chair)

19 Oct 95
Chris Jones

(Dean)

Nov 9/95
[Signature]

(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline

FIELD GEOLOGY II

General

EASC 306 is a 7-day field camp held after the final week of the Spring semester. There will be several lectures scheduled, during the semester prior to the field course, covering those topics that are a necessary background prior to entering the field. The camp will focus on the field logging and interpretation of rock bodies.

Prerequisites

Completion of required 3rd year courses for Earth Sciences majors.

Course Topics

Various site visits emphasizing field methods and technique: logging, mapping and interpretation of sections and outcrop.

Course Text

Compton, R.R., 1982. Manual of Field Geology. Wiley

Field-trip Fee

A fee will be levied to offset the field costs of the EASC 306.

Course Grade

The grade for this field school will be based entirely on a field report.

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**

Abbreviation Code: **EASC** Course #: **307** Credit Hrs: **3** Vector: **2-0-2**

Title of Course: **Applied Geophysics**

Calendar Description of Course: **Application, instrumentation and limitations of electrical, electromagnetic, ground penetrating radar and seismic methods for engineering and geoscience applications.**

Nature of Course: **Lecture/lab**

Prerequisites (or special instructions): **EASC 207**

What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling

How frequently will the course be offered? **Once every 6 semesters**

Semester in which the course will first be offered? **98-1**

Which of your present faculty would be available to make the proposed offering possible? **New faculty**

3. Objectives of the Course: **To provide applications of geophysics to environmental problems. This course will fulfill APEGBC requirements.**

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty **None beyond already authorized faculty**

Staff **None beyond already authorized staff**

Library* **None**

Audio Visual **None**

Space **See attached memo**

Equipment **See attached memo**

5. Approval

Date: Sept 14/95 190 d 95 No. 9195

Michael Globus

(Department Chair)

Chris Jones

(Dean)

John Case

(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts
92-3 (* note: a separate library report is now required)

Course Outline
APPLIED GEOPHYSICS

General

EASC 307 is a course in the application of geophysics to the understanding and analysis of near-subsurface geology. Many environmental geoscience problems are encountered in the upper 100 metres of the earth's crust and it is essential for the practising geoscientist to have a working understanding of modern near-surface geophysical methods,

Prerequisites

EASC 207

Course Topics

1. How seismic waves propagate
2. Acquisition of seismic data: on land
at sea
3. Transformation of reflections into geological structures.
4. Geological interpretation of seismic data
5. Seismic refraction
6. Gravity prospecting: principles and instruments
7. Magnetic prospecting: principles and instruments
8. Ground penetrating radar
9. Application of geophysical methods in selected case studies.

The laboratory session will be conducted in the field on selected days: instrument will be set up and used in a field environment.

Course Text

M. B. Dobrin, 1976. Introduction to Geophysical Prospecting. (3rd edition). McGraw-Hill.

Course Grade

Grades will be based on the following components:

(a) Midterm examination	: 30%
(b) Laboratory assignments	: 30%
(c) Final theory examination	: 40%

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **308** Credit Hrs: **3** Vector: **2-0-2**
Title of Course: **Low temperature geochemistry**
Calendar Description of Course: **Low temperature aqueous solution geochemistry. Geochemical problems in sedimentary and geomorphic environments .**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **EASC 205 and EASC 302; CHEM 232 is recommended**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**
2. Scheduling
How frequently will the course be offered? **Once every 6 semesters**
Semester in which the course will first be offered? **98-1**
Which of your present faculty would be available to make the proposed offering possible? **New faculty / sessional instructor**
3. Objectives of the Course: **To provide an advanced course in geochemistry for the Earth Sciences Program; to provide examples of the application of geochemistry to environmental problems.**
4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **See attached memo**

5. Approval

Date: Sept 14/95 19 0 d 95 Nov 9/95

Michael Roberts CHW Jones Justin O'Neil
(Department Chair) (Dean) (Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
LOW TEMPERATURE GEOCHEMISTRY

General

EASC 308 is a course in the geochemistry of weathering and diagenesis in sedimentary environments.

Prerequisites

EASC 205, or EASC 302, CHEM 232 is recommended

Course Topics

1. Geochemistry of aqueous solutions
2. Fluid flows in sediments
3. The geochemistry of weathering
4. The geochemical flows in landscapes
5. Geochemical barriers
6. Analytical geochemistry

Course Text

J.A.C. Fortescue, 1980, Environmental Geochemistry. Springer Verlag.

Course Grade

Grades will be based on the following components:

(a) Midterm examination	: 30%
(b) Laboratory assignments	: 30%
(c) Final theory examination	: 40%

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**

Abbreviation Code: **EASC** Course #: **401** Credit Hrs: **3** Vector: **2-0-2**

Title of Course: **Mineral Deposits**

Calendar Description of Course: **The petrology and genesis of metalliferous ore deposits; description of classic ore deposits; the occurrence and exploitation of industrial and non-metallic minerals.**

Nature of Course: **Lecture/lab**

Prerequisites (or special instructions): **At least 60 credit hours including 9 hours of EASC courses.**

What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling

How frequently will the course be offered? **Once every 6 semesters**

Semester in which the course will first be offered? **98-3**

Which of your present faculty would be available to make the proposed offering possible? **New faculty / sessional instructor**

3. Objectives of the Course: **To provide an advanced course in fluvial processes and sediment transport theory for the Earth Sciences Program.**

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty **None beyond already authorized faculty**

Staff **None beyond already authorized staff**

Library* **None**

Audio Visual **None**

Space **See attached memo**

Equipment **See attached memo**

5. Approval

Date:

Sept 14/95

12 Oct 95

Nov 9/95

Michael C Roberts

Chris Jones

Justin O'Keefe

(Department Chair)

(Dean)

(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
MINERAL DEPOSITS

General

A course in the character, distribution and origin of mineral deposits largely based on case studies and examples from the Canadian mining industry.

Prerequisites

At least 60 credit hours including 9 hours of EASC courses

Course Topics

1. Principles of economic geology: economics, exploitation, history of mineral use; mineral deposits: nature and genesis.
2. Processes of formation of mineral deposits
 - a. Magmatic concentration
 - b. Sublimation
 - c. Contact metasomatism
 - d. Hydrothermal
 - e. Sedimentation
 - f. Bacteriogenic
 - g. Submarine volcanogenic
 - h. Evaporation
 - i. Residual and mechanical concentration
 - j. Oxidation and supergene enrichment
 - k. Metamorphism
3. Classification of mineral deposits
4. Metallic mineral deposits
5. Non-metallic minerals

Course Text

M.L. Jensen & A.M. Bateman. 1981. Economic Mineral Deposits. Wiley, New York. 593 p.

Course Grade

Grades will be based on the following components:

(a) Midterm examination	: 25%
(c) Laboratory assignments	: 25%
(d) Term project	: 25%
(e) Final theory examination	: 25%

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **402** Credit Hrs: **3** Vector: **2-0-3**
Title of Course: **Sedimentology**
Calendar Description of Course: **Sediment transport in fluids, the formation, character and classification of internal structures in sediments and paleoenvironmental analysis**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **EASC 302**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **Once every 5 semesters**
Semester in which the course will first be offered? **97-1**
Which of your present faculty would be available to make the proposed offering possible?
J. MacEachern and E.J. Hickin

3. Objectives of the Course: **To provide an advanced analysis of sediment transport and deposition.**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **See attached memo**

5. Approval

Date: <u>Sept 14/95</u>	<u>19 Oct 95</u>	<u>Nov 9/95</u>
<u>Michael C Roberts</u>	<u>Chr. Gons</u>	<u>Juan A. Ochoa</u>
(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts
92-3 (* note: a separate library report is now required)

Course Outline

SEDIMENTOLOGY

General

EASC 402 is an advanced course in the processes of clastic sediment transport and deposition. The course includes a detailed analysis of sedimentary environments and facies.

Prerequisites

EASC 302

Course Topics

1. Basic properties of fluids, flows, and sediment.
2. Sedimentary structures
 - facies analysis
 - architectural elements
 - depositional structures
 - in muds
 - in sands
 - in gravels
3. Deformation structures
4. reconstructing sedimentary environments

Course Text

Collinson, J.D. and Thompson, D.B. 1982, Sedimentary Structures. Allen & Unwin.

Course Grade

Grades will be based on the following components:

(a) Laboratory assignments	: 30%
(b) Midterm theory examination	: 30%
(c) Final theory examination	: 40%

Enquiries

Further information about this course can be obtained from the Instructor, Professor Ted Hickin, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **403** Credit Hrs: **3** Vector: **2-0-3**
Title of Course: **Quaternary Geology**
Calendar Description of Course: **Stratigraphy and history of the Quaternary Period with emphasis on glaciation, glacial sediments, and Holocene alluvial fills.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **Geog 313**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **Once a year**
Semester in which the course will first be offered? **96-3**
Which of your present faculty would be available to make the proposed offering possible? **M.C. Roberts**

3. Objectives of the Course: **To provide a foundation in the depositional sediments and processes of the Quaternary, a period of time during which most of the surficial landscape of Canada was formed.**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **See attached memo**

5. Approval

Date: <u>Sept 14/95</u>	<u>19 Oct 95</u>	<u>Nov. 9/95</u>
<u>Michael C Roberts</u>	<u>Chris Jones</u>	<u>John A. O'Neil</u>
(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline

QUATERNARY GEOLOGY

General

This course will examine selected aspects of the stratigraphy, geomorphology and surficial geology of the Quaternary. Glacial and fluvial depositional models will be reviewed. The regional emphasis of the course will be on western Canada and the adjacent parts of the U.S. Fieldwork will be integrated into all aspects of the course.

Course Organization

There will be a 2 hour lecture and a 3 hour laboratory. The course will be taught on Fridays (96-1) - do NOT schedule any other course on that day. However, on most days, fieldtrips will replace both the lecture and the lab. Two weekend fieldtrips are planned:

- (a) In early March, we will spend a weekend in the interior on a field mapping exercise. The exact date will be announced later.
- (b) In March, we will take a three day fieldtrip to Channeled Scablands of central Washington.

Fieldwork

Since we will be in the field a minimum of 9 days during the semester, you should be prepared for wet weather. You will need a backpack, field boots, a trowel, a 35mm camera as well as such standard items as a field notebook, pen and pencils etc. You should budget for field trip costs.

Text

M. Hambrey, 1994, Glacial Environments, UBC Press.

Course Topics

1. The Quaternary Period - an overview.
2. A review of glacial and periglacial geomorphology.
3. Stratigraphic concepts: stratigraphic procedures for surface outcrops and subsurface cores; concepts unique to the Quaternary; terminology; the application of the stratigraphic code; correlation; type sections.
4. Geochronological techniques applicable to the Quaternary.
5. Quaternary stratigraphy: the evolution of Quaternary stratigraphic concepts; the classical regions - Alps and Midwest.
6. The Quaternary of BC emphasizing the record of southwestern British Columbia.
7. Models of glacial depositional environments.
8. Models of fluvial depositional environments.
9. Soils in the Quaternary record.
10. Palynology.
11. Tephrae.
12. Sea-level changes.

Grading and Work Assignments

Laboratory and field reports	60%
Mid-term examination	15%
Final examination	25%

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **404** Credit Hrs: **3** Vector: **2-0-2**
Title of Course: **Subsurface Methods for Environmental Geoscience**
Calendar Description of Course: **Theory, analysis and practical interpretation of well logs. Use of well logs in petroleum, coal resource evaluation, and environmental geoscience.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **At least 60 credit hours including 9 hours of upper level Earth Science credits.**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **Once a year**
Semester in which the course will first be offered? **97-1**
Which of your present faculty would be available to make the proposed offering possible?
J.A. MacEachern; M.C. Roberts

3. Objectives of the Course: **To provide a foundation in the use of well logs for the analysis of earth materials in the subsurface.**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **See attached memo**

5. Approval
Date: Sept 14 / 95 19 Oct 95 Nov. 9 / 95
M. C. Roberts Ch. Jones John O'Connell
(Department Chair) (Dean) (Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline

SUBSURFACE METHODS FOR ENVIRONMENTAL GEOSCIENCE

General

The investigation of sedimentary rocks utilizing direct evidence (cores, cuttings) and indirect methods (well logs) is a critical component of evaluating subsurface resources. These techniques have been traditionally confined to the hydrocarbon industry, but with the availability of low-cost PC based instrumentation the use of geophysical logs is becoming widespread in the practice of geoscience.

The course will provide a brief theoretical review of each method preceding a laboratory in which the actual logs will be evaluated.

Prerequisite

At least 60 credit hours including 9 hours of upper level Earth Science credits.

Course Organization

There will be a 2 hour lecture and a 2 hour laboratory.

Text

J.T. Dewan, 1983. Essentials of Modern Open-Hole Log Interpretation. PennWell Books, Tulsa, Oklahoma.

Course Topics

1. Introduction to well logging.
2. Spontaneous Potential (SP) log.
3. Resistivity logs.
4. Gamma-Ray log.
5. Caliper log.
6. Density and Neutron logs.
7. Lithologic Analysis of logs.
8. Environmental case studies.
9. Well log use in the petroleum and coal industries.

Grading and Work Assignments

Laboratory assignments	60%
Mid-term examination	15%
Final examination	25%

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**

Abbreviation Code: **EASC** Course #: **405** Credit Hrs: **3** Vector: **2-0-2**

Title of Course: **Basin Analysis**

Calendar Description of Course: **The study of major depositional systems. Methods of analyzing basin geometry, depositional and tectonic history; basin classification; basin models; basin characteristics.**

Extensive use of western Canadian examples.

Nature of Course: **Lecture/lab**

Prerequisites (or special instructions): **75 credit hours and EASC 306**

What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling

How frequently will the course be offered? **Once every 5 semesters**

Semester in which the course will first be offered? **97-3**

Which of your present faculty would be available to make the proposed offering possible? **D.J. Thorkelson and P. Mustard**

3. Objectives of the Course: **To provide the theoretical background and analytical skills necessary for the understanding of depositional systems in basinal settings. Applications to hydrocarbon exploration.**

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:

Faculty **None beyond already authorized faculty**

Staff **None beyond already authorized staff**

Library* **None**

Audio Visual **None**

Space **See attached memo**

Equipment **See attached memo**

5. Approval

Date: Sept 14/95

19 Oct 95

Nov. 9/95

Michael C Roberts

CHW. J. ONL

Justin D. ...

(Department Chair)

(Dean)

(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
BASIN ANALYSIS

General

This course is concerned with the analysis of the paleogeographic evolution of ancient sedimentary basins. Emphasis is on the use of outcrops, well records and core data rather than the formal description of stratigraphic units.

Basin analysis requires an understanding of diverse geological specialities and an ability to assess the relationships between varied types of evidence.

Prerequisites

75 credit hours and EASC 306

Course Topics

1. Introduction to basins
2. Stratigraphic methods as they apply to basin analysis
3. Depositional systems and facies analysis within a basinal context
4. Basin mapping methods
5. Basin subsidence and fill models
6. Sedimentation, plate tectonics and sea-level change

Course Text

Miall, A.D., 1990, Principles of Sedimentary Basin Analysis. Springer Verlag, New York (2nd Edition).

Course Grade

Grades will be based on the following components:

(a) Midterm examination	: 30%
(b) Final examination	: 40%
(c) Written laboratory assignments	: 20%
(d) Field trip report	: 10%

Enquiries

Further information about this course can be obtained from the course Instructor.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **406** Credit Hrs: **3** Vector: **0-0-3**
Title of Course: **Field geology III**
Calendar Description of Course: Methods of observing, recording and correlating geologic data. A 12 day field school will be held immediately following the Spring examination period.
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **EASC 306**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **Once a year**
Semester in which the course will first be offered? **97-1**
Which of your present faculty would be available to make the proposed offering possible? **EASC faculty**

3. Objectives of the Course: **To provide a core course of fieldwork for the Earth Sciences Program**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **See attached memo**

5. Approval

Date: <u>Sept 14/95</u>	<u>19 Oct 95</u>	<u>Nov. 9/95</u>
<u>Michael C. Robur</u>	<u>Chw. Jones</u>	<u>Justin O'Neil</u>
(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts
92-3 (* note: a separate library report is now required)

Course Outline
FIELD GEOLOGY III

General

EASC 406 is a field school designed to give senior undergraduates experience in applying various theoretical concepts in the field. Emphasis is given to techniques of describing and analyzing rock deformation in a variety of geological settings.

Prerequisites

EASC 306

Course Topics

Various site visits in the B.C. Interior.

Course Text

There is no course text; a number of field guides will be distributed during the course.

Field-trip Fee

A fee will be levied to offset the cost of the EASC 406 field trip.

Course Grade

The course grade will be based on the assessment of a major field report.

Enquiries

Further information about this course can be obtained from the Instructor, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
 Abbreviation Code: **EASC** Course #: **409** Credit Hrs: **3** Vector: **2-0-2**
 Title of Course: **Rivers: Environments and Engineering**
 Calendar Description of Course: **Fluid mechanics of open channel flow, channel formation and maintenance, sediment transport and deposition, and river engineering case studies.**
 Nature of Course: **Lecture/lab**
 Prerequisites (or special instructions): **EASC 201; GEOG 313; MATH 152; and PHYS 121**
 What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
 How frequently will the course be offered? **Once every 6 semesters**
 Semester in which the course will first be offered? **97-3**
 Which of your present faculty would be available to make the proposed offering possible? **E. J. Hickin**

3. Objectives of the Course: **To provide an advanced course in fluvial processes and sediment transport theory and a review of river engineering case studies.**

4. Budgetary and Space Requirements
 What additional resources will be required in the following areas:
 Faculty **None beyond already authorized faculty**
 Staff **None beyond already authorized staff**
 Library* **None**
 Audio Visual **None**
 Space **See attached memo**
 Equipment **See attached memo**

5. Approval

Date: <u>Sept 14/95</u>	<u>190 d 95</u>	<u>Nov-9/95</u>
<u>Michael C. Roberts</u>	<u>Ch. W. Jones</u>	<u>Justin O'Connell</u>
(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline

RIVERS: ENVIRONMENTS AND ENGINEERING

General

EASC 409 is a course in the application of fluid mechanics to open channel flow, sediment transport theory, and river engineering.

Prerequisites

EASC 201, GEOG 313, MATH 152; PHYS 121

Course Topics

1. The energy equation and flow transitions
2. The momentum equation and wave phenomena
3. Flow resistance
4. Threshold scour conditions and the equilibrium alluvial channel
5. Sediment transport theory
6. Fluvial deposition

Course Text

Knighton, D., 1989, Fluvial Process and Form, Edward Arnold

Course Grade

Grades will be based on the following components:

(a) Midterm examination	: 25%
(b) Laboratory assignments	: 25%
(c) Term project	: 25%
(d) Final theory examination	: 25%

Enquiries

Further information about this course can be obtained from the Instructor, E.J. Hickin, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **490** Credit Hrs: **0** Vector: **0**
Title of Course: **Undergraduate Seminar**
Calendar Description of Course: **A seminar for undergraduates in their final year of the Earth Science Program. Visiting speakers, site visits to mines and drilling locations. Discussions of the application of Earth Science in industry.**
Nature of Course: **Lecture/lab**
Prerequisites (or special instructions): **90 credit hours and majoring in Earth Sciences or Physical Geog.**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **Once a year**
Semester in which the course will first be offered? **97-3**
Which of your present faculty would be available to make the proposed offering possible? **Director of Earth Sciences Program**

3. Objectives of the Course: **To provide the opportunity for senior undergraduates in the Earth Sciences Program to interact with the research community and practicing geoscientists in the industrial sector . An introduction to professional practice.**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **See attached memo**
Equipment **See attached memo**

5. Approval

Date: Sept 14/95 12 0 4 95 Nov. 9/95
Michael C Roberts Chris Jones [Signature]
(Department Chair) (Dean) (Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Course Outline
UNDERGRADUATE SEMINAR

General

EASC 490 is a seminar series designed to give the opportunity for senior undergraduates in the Earth Sciences Program to interact with the research community and practicing geoscientists in the industrial sector. Seminars will include a discussion of professional practice in the geosciences (APEGBC).

Prerequisites

90 credit hours and majoring in Earth Sciences or Physical Geography.

Course Topics

1. Visiting speaker series
2. Professional practice in geoscience: ethics and responsibilities.
3. Geoscientist in Training: expectations of the profession. Log book. Evaluation of work.

Course Grade

No grade is assigned for this course but attendance of, and participation in, the Earth Sciences Visiting Speakers program is required for completion.

Enquiries

Further information about this course can be obtained from the Program Director, Earth Sciences Program.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **491** Credit Hrs: **1** Vector: **0 - 1 - 0**
Title of Course: **Directed Readings**
Calendar Description of Course: **A course in which reading and research, and/or field work will be supervised by a faculty member.**
Nature of Course: **Seminar**
Prerequisites (or special instructions): **75 credit hours including 30 hours in Earth Science courses; and permission of the department**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **On request.**
Semester in which the course will first be offered? **97-3**
Which of your present faculty would be available to make the proposed offering possible? **EASC faculty**

3. Objectives of the Course: **To provide the opportunity for senior undergraduates in the Earth Sciences Program to pursue a particular topic mutually agreed upon with the supervising professor**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **None**
Equipment **None**

5. Approval

Date: <u>Sept 14 / 95</u>	<u>19 Oct 95</u>	<u>Nov 9 / 95</u>
<u>Michael Roberts</u>	<u>Chris Jones</u>	<u>John Case</u>
(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts
92-3 (* note: a separate library report is now required)

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **492** Credit Hrs: **2** Vector: **0 - 2 - 0**
Title of Course: **Directed Readings**
Calendar Description of Course: **A course in which reading and research, and/or field work will be supervised by a faculty member**
Nature of Course: **Seminar**
Prerequisites (or special instructions): **75 credit hours including 30 hours in Earth Science courses; and permission of the department**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **On request.**
Semester in which the course will first be offered? **97-3**
Which of your present faculty would be available to make the proposed offering possible? **EASC faculty**

3. Objectives of the Course: **To provide the opportunity for senior undergraduates in the Earth Sciences Program to pursue a particular topic mutually agreed upon with the supervising professor.**

4. Budgetary and Space Requirements
What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **None**
Equipment **None**

5. Approval

Date:	<u>Sept 14/95</u>	<u>19 Oct 95</u>	<u>Nov. 9/95</u>
	<u>Michael Roberts</u>	<u>Chris Jones</u>	<u>Justin Davis</u>
	(Department Chair)	(Dean)	(Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
 Abbreviation Code: **EASC** Course #: **493** Credit Hrs: **3** Vector: **0 - 3 - 0.**
 Title of Course: **Directed Readings**
 Calendar Description of Course: **75 credit hours including 30 hours in Earth Science courses; and permission of the department**
 Nature of Course: **Seminar**
 Prerequisites (or special instructions): **75 credit hours including 30 hours in Earth Science courses; and permission of the department**
 What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
 How frequently will the course be offered? **On request.**
 Semester in which the course will first be offered? **97-3**
 Which of your present faculty would be available to make the proposed offering possible? **EASC faculty**

3. Objectives of the Course: **To provide the opportunity for senior undergraduates in the Earth Sciences Program to pursue a particular topic mutually agreed upon with the supervising professor**

4. Budgetary and Space Requirements
 What additional resources will be required in the following areas:
 Faculty **None beyond already authorized faculty**
 Staff **None beyond already authorized staff**
 Library* **None**
 Audio Visual **None**
 Space **None**
 Equipment **None**

5. Approval
 Date: Sept 14/95 19 Oct 95 Nov. 9/95
Michael C Roberts Chris Jones [Signature]
 (Department Chair) (Dean) (Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information Department: **Earth Sciences Program, Faculty of Science**
Abbreviation Code: **EASC** Course #: **499** Credit Hrs: **9** Vector: **0 - 9 - 0**
Title of Course: **Honours Thesis**
Calendar Description of Course: **An in-depth investigation of a topic in Earth Science**
Nature of Course: **Student project**
Prerequisites (or special instructions): **105 credit hours; admittance to the Honours program, and consent of supervisor.**
What course (courses), if any, is being dropped from the calendar if this course is approved: **None**

2. Scheduling
How frequently will the course be offered? **As required**
Semester in which the course will first be offered? **97-3**
Which of your present faculty would be available to make the proposed offering possible? **EASC faculty**

3. Objectives of the Course: **To provide the opportunity for senior undergraduates in the Earth Sciences Program to pursue advanced work on specialized topics in the Earth Sciences.**

4. Budgetary and Space Requirements

What additional resources will be required in the following areas:
Faculty **None beyond already authorized faculty**
Staff **None beyond already authorized staff**
Library* **None**
Audio Visual **None**
Space **None**
Equipment **None**

5. Approval

Date: Sept 14/95 190 of 95 Nov 9/95
Michael Coburn Chris Jones Justin O'Neil
(Department Chair) (Dean) (Chair, SCUS)

SCUS 73-34b:-(When completing this form, for instructions see Memorandum SCUS 73-34a. Attached course outline). Arts 92-3 (* note: a separate library report is now required)

Department of Mathematics and Statistics

SCUS Reference: SCUS 95 - 18 d
SCAP Reference: SCAP 95 - 60 c

- i) New courses: STAT 203-3 Introduction to Statistics for the Social Sciences
MATH 486-0 Job Practicum V
ACMA 395-3 Special Topics in Actuarial Mathematics
Deletion of: STAT 103-3 Introduction to Statistics for the Social Sciences
- ii) Changes to requirements for Certificate in Actuarial Mathematics
- iii) Changes in requirements for Mathematics major and honors programs

For Information:

Acting under delegated authority of Senate, SCUS has approved the following revisions as detailed in SCUS 95-18d:

MATH 462 Change of description and prerequisite
MACM 316 Change of description and prerequisite

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
COURSE PROPOSAL FORM

1. Calendar Information Department: Mathematics and Statistics
Abbreviation Code: *STAT Course Number: 203 Credit Hours: 3 Vector: 3-0-1†

Title of Course: Introduction to Statistics for the Social Sciences

Calendar Description of Course: An introductory course in descriptive and inferential statistics aimed at students in the social sciences. Scales of measurement. Descriptive Statistics. Measures of Association. Hypothesis tests and confidence intervals.

Nature of Course: Lecture

Prerequisites (or special instructions):

BC Math 11 (or equivalent) or Basic Algebra. A research methods course such as SA 255, CRIM 120, POL 213 or equivalent is recommended. Students in Sociology and Anthropology are expected to take SA 255 before this course. Students with credit for ARCH 376, BUEC 232 (formerly 332), or STAT 270 may not subsequently receive credit for this course. Students with credit for any of STAT 101, 102, 103, or 301 may not take this course for further credit.

What course (courses), if any, is being dropped from the calendar if this course is approved: STAT 103.

2. Scheduling

How frequently will the course be offered? Three times every two years.

Semester in which the course will first be offered? 97-1

Which of your present faculty would be available to make the proposed offering possible:
Dean, Eaves, Lockhart, Routledge, Schwarz, Sitter, Swartz, and Weldon.

3. Objectives of the Course:

4. Budgetary and Space requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty:

Staff:

Library:

Audio Visual:

Space

Equipment

5. Approval

Date: 29 March 95 12 Oct 98 Nov. 9/95

[Signature] atw. Jones [Signature]
Department Chair Dean Chair, SCUS

STATISTICS 203-3
INTRODUCTION TO STATISTICS FOR THE SOCIAL SCIENCES

Detailed course outline

1.	Introduction. Scales of measurement: nominal, ordinal, interval and ratio.	2	2 hours
2.	Descriptive statistics for 1 variable:	3,4.1-3, 5	2 hours.
3.	Descriptive statistics for 2 variables: measures of association. Proportional reduction in error for measures of association. Nominal: lambda (1 hour) Ordinal: gamma. (1 hour) Two by two contingency tables: Yule's Q. (1 hour) Interval and ratio: Pearson's correlation coefficient, r. (2 hours) Note: each of these is to be discussed only as a descriptive statistic at this point.	6, 7	5 hours
4.	Sampling and sample surveys. Simple random sampling, cluster sampling, stratification	11	3 hours
5	The role of probability in statistics. The normal curve. Finding areas under the normal curve. The sampling distribution of the mean. Note: binomial formula not included.	10.1, 5.5, 12.1-5	3 hours
6	Hypothesis tests. Logic of testing. Fixed level tests and P-values. One sample z and t-tests for means and proportions.	14, 15.1, 15.4	4 hours
7	Two sample tests: equality of two proportions, equality of two means, two sample and paired comparison t-tests. Mann-Whitney tests (not covered in text).	15.2,15.5, 15.9.2	5 hours
8	Cross-classified data: hypothesis tests for contingency tables. Chi-squared test, Fisher's exact test (not covered in text).	16.1,	4 hours
9	Confidence Intervals for means and proportions: 1 sample	13.1-3	3 hours
9	Introduction to regression analysis	7.4, 9, 16.4	4 hours
10	Introduction to logistic regression: (just show an example)	not in text, but see 16.2	1 hour

Textbook: *Descriptive and inferential statistics, 4th ed.* Loether, H. J. and McTavish, D. G. Allyn and Bacon: 1993.

Rationale

After consultation with the Department of Sociology and Anthropology and the School of Criminology, we have agreed to provide a course that emphasizes scales of measurement, descriptive statistics for discrete data and the corresponding statistical tests and confidence intervals and de-emphasizes experimental design. The course will replace STAT 103 for these students. Many of the ideas in the experimental design section of STAT 103 are covered in the new suggested prerequisites SA 255 or CRIM 120 and are not re-examined here. The choice of a 200 level number is based primarily on sequencing; the course will follow a research methods course numbered 2XX in several departments and precede quantitative methods courses numbered 3XX in most departments.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
COURSE PROPOSAL FORM

1. Calendar Information Department: Mathematics and Statistics
Abbreviation Code: MATH Course Number: 486 Credit Hours: 0 Vector:

Title of Course: Job Practicum V

Calendar Description of Course: This is an optional fifth semester of work experience in the Co-operative Education program available to Mathematics and Statistics students.

Nature of Course: Co-op practicum

Prerequisites (or special instructions) : MATH 437 and permission of the co-op coordinator. Students must apply at least one semester in advance..

What course (courses), if any, is being dropped from the calendar if this course is approved: none

2. Scheduling

How frequently will the course be offered? Every semester

Semester in which the course will first be offered? Fall 1996

Which of your present faculty would be available to make the proposed offering possible: Co-op coordinator.

3. Objectives of the Course: To allow additional work experience through the Co-operative Education program.

4. Budgetary and Space requirements (for information only)

What additional resources will be required in the following areas: No additional resources are required.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 29 March 95 19 0 0 75 Nov. 9/95

[Signature] [Signature] [Signature]
Department Chair Dean Chair, SCUS

SCUS 73-34b:- (When completing this form, for instructions see Memorandum SCUS 73-34a. Attach course outline.)

RATIONALE FOR FIFTH CO-OP PRACTICUM

Co-operative Education is changing from the historical strict alternation of work terms with study semesters. Many more employers and students are completing 8-month work terms which count as two practicums. This often leads to students working at only 2 or 3 companies. The fifth work term allows the students one more opportunity to explore career opportunities. We are currently placing mathematical sciences students on fifth co-ops, and they register for the fifth Computing Science practicum. Having a fifth mathematics and statistics practicum will allow the students to have the right course on their transcripts and will allow us to track the students easily.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES
COURSE PROPOSAL FORM

Department: Mathematics & Statistics

1. Calendar Information

Abbreviation Code: ACMA

Course Number: 395

Credit Hours: 3

Vector:

Title of Course: Special Topics in Actuarial Science

Calendar Description of Course: Data: Topics in areas of Actuarial Science not covered in the Regular Certificate curriculum of the department.

Nature of Course: Lecture, reading or research.

Prerequisite (or special instructions): Dependent on the topics covered.

What course (courses), if any, is being dropped from the calendar if this course is approved. None

2. Scheduling

How frequently will the course be offered? Irregularly, as needed.

Semester in which the course will first be offered? As needed.

Which of your present faculty would be available to make the proposed offering possible:
Parker, Reilly, and others depending on the topic covered.

3. Objectives of the Course:

To explore other actuarial topics and/or look at how the theory studied in the other ACMA courses is applied in practice.

4. Budgetary and Space requirements (for information only)

What additional resources will be required in the following areas: None.

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date: 29 March 95 17 Oct 95 Nov. 9/95
[Signature] [Signature] [Signature]
Department Chair Dean Chair, SCUS

SCUS 73-34b:- (When completing this form, for instructions see Memorandum SCUS 73-34a. Attach course outline.)

SIMON FRASER UNIVERSITY

DEPARTMENT OF
MATHEMATICS & STATISTICS



BURNABY, BRITISH COLUMBIA
CANADA V5A 1S6
Telephone: (604) 291-3331/3332

October 19, 1994

To: UGSC members

From: Gary Parker

Re: CERTIFICATE PROGRAM IN ACTUARIAL MATHEMATICS.

I would like to propose some changes to the existing Certificate Program in Actuarial Mathematics in order to make it more in line with what has been done in the last 2 years and to reduce the number of special cases created by students who already have a degree when they enroll in the program.

The following is a summary of the proposed changes to our present program.

- 1- Remove MATH-151 and MATH-152 from the list of required courses. The students would still have to do these courses since they are prerequisites of others.
- 2- Add more existing courses to the list of courses students can take. These are ACMA-395, MATH-308, STAT-350 and STAT-450.
- 3- Create a new course ACMA-395 Special Topics in Actuarial Science. This is to accommodate students transferring from other universities with many waivers and/or transfer credits. It would also benefit students who need just one ACMA course to graduate and cannot take any of the few ACMA courses offered in their last semester or two. It would rarely, if ever, be offered as a regular course. When offered, it would be a reading course.
- 4- Add a minimum grade of C+ to the existing prerequisite ACMA-310 for the course ACMA-320. This is already done but not in the calendar.
- 5- Some minor editorial changes in the calendar.

The new calendar entries are given on the enclosed page with the changes in bold.

A handwritten signature in black ink, appearing to read 'Gary Parker'.

Gary Parker

From:

CERTIFICATE PROGRAM IN ACTUARIAL MATHEMATICS

p. 166 of the 1994-1995 calendar

- Certificate in Actuarial Mathematics

This certificate program prepares the students for most of the Society of Actuaries Associateship examinations (SOA courses through 165) or the Casualty Actuarial Society Associateship examinations (parts 1 through 4). **Students enrolling in this program should already have completed MATH 151, MATH 152 or their equivalents and have knowledge of one programming language.** To obtain the certificate, **12** of the following courses must be completed.

Each of:

ACMA 310-3	Mathematics of Compound Interest
ACMA 320-3	Actuarial Mathematics I
MATH 232-3	Elementary Linear Algebra
STAT 270-3	Introduction to Probability and Statistics
STAT 280-3	Applied Probability Models

At least four of:

ACMA 315- 3	Credibility Theory and Loss Distributions
ACMA 325- 3	Actuarial Mathematics II
ACMA 335- 3	Risk Theory
ACMA 345- 3	Survival Models
ACMA 355- 3	Graduation of Life Tables
ACMA 365- 3	Mathematics of Demography
ACMA 395- 3	Special Topics in Actuarial Science

At least one of:

MACM 316-3	Numerical Analysis I
MATH 308-3	Linear Programming
STAT 330-3	Linear Models in Applied Statistics I
STAT 350-3	Linear Models in Applied Statistics II
STAT 450-3	Statistical Theory

Note: Students enrolled in an honors, major, or minor program in Mathematics may count these MATH, MACM, or STAT courses both toward the Certificate in Actuarial Mathematics and for the Mathematics program. The ACMA courses may be used to satisfy upper division requirements for minor in Mathematics, or for the honors, major, or minor Mathematics programs with the Statistics option.

Students with a degree may get waivers and/or transfer credits. In all cases, the students must take a minimum of 9 courses while enrolled in the certificate program. At least 6 of the courses must be taken at SFU of which a minimum of 4 must be ACMA courses.

Page 174 of the 1994-1995 calendar:

In ACMA 320: Prerequisites: ACMA 310 (with a grade of C+ or higher). MATH 232 and STAT 280 must precede or be taken concurrently.

Note: **bold face** indicates the changes.

CERTIFICATE PROGRAM IN ACTUARIAL MATHEMATICS

Page 166 of the calendar.

- Statistics Minor Option: **ACMA 315-3 Credibility Theory and Loss Distributions**

To: - Certificate in Actuarial Mathematics

This certificate program prepares the students for most of the Society of Actuaries Associateship examinations (SOA courses through 165) or the Casualty Actuarial Society Associateship examinations (parts 1 through 4). **Students enrolling in this program must already have completed MATH 151, MATH 152 or their equivalents and have knowledge of one programming language.** To obtain the certificate, **12** of the following courses must be completed.

Each of:

ACMA 310-3 **Mathematics of Compound Interest**
ACMA 320-3 **Actuarial Mathematics I**
MATH 232-3 Elementary Linear Algebra
STAT 270-3 Introduction to Probability and Statistics
STAT 280-3 Applied Probability Models

At least four of:

ACMA 315- 3 Credibility Theory and Loss Distributions
ACMA 325- 3 Actuarial Mathematics II
ACMA 335- 3 Risk Theory
ACMA 345- 3 Survival Models
ACMA 355- 3 Graduation of Life Tables
ACMA 365- 3 Mathematics of Demography
ACMA 395- 3 Special Topics in Actuarial Science

At least one of:

MACM 316-3 Numerical Analysis I
MATH 308-3 Linear Programming
STAT 330-3 Linear Models in Applied Statistics I
STAT 350-3 Linear Models in Applied Statistics II
STAT 450-3 Statistical Theory

Note: Students enrolled in an honors, major, or minor program in Mathematics may count these MATH, MACM, or STAT courses both toward the Certificate in Actuarial Mathematics and for the Mathematics program. The ACMA courses may be used to satisfy upper division requirements for minor in Mathematics, or for the honors, major, or minor Mathematics programs with the Statistics option.

Students with a degree may get waivers and/or transfer credits. In all cases, the students must take a minimum of 9 courses while enrolled in the certificate program. At least 6 of the courses must be taken at SFU of which a minimum of 4 must be ACMA courses.

Page 174 of the calendar:

In ACMA 320: Prerequisites: ACMA 310 (with a grade of C+ or higher). MATH 232 and STAT 280 must precede or be taken concurrently.

In ACMA 365: replace consensus by **census**

*The **Bold** characters indicate changes to the 1994-1995 Calendar.

SFU SIMON FRASER UNIVERSITY

MEMORANDUM

To: M. Plischke Chair, Faculty of Science, Undergraduate Committee	Date Sept. 21, 1995 From: N. Reilly Chair, Undergraduate Studies Committee, Department of Mathematics and Statistics
Subject: Change in Requirements	

The changes in the requirements for the Mathematics major and honors programs detailed in the attached document were approved by the Department at its meeting on Monday, September 18, 1995.

The purpose of these changes is to allow mathematics majors and honors students to count Actuarial Mathematics courses towards their upper division mathematics requirements.

Norman R. Reilly

Attachment

cc: K. Heinrich, Chair
Department of Mathematics and Statistics

NR:ged

Change in Requirements for Mathematics Major Program and Honors Program

Currently portions of the requirements read as follows (95/96 Calendar, page 165):

- (iv) In the case of **major** students - to obtain a total of at least 44 (BSc) or 45 (BA) semester hours of credit in upper division courses of which at least 30 hours must be in upper division Mathematics or Statistics courses or Mathematics/Computing Science (MACM) courses; ...
- (v) In the case of **honors** students - to obtain a total of at least 60 semester hours of credit in upper division courses of which at least 50 hours must be in upper division Mathematics or Statistics courses or Mathematics/Computing Science (MACM) courses; ...

We propose to change this to read (new wording is italicized):

- (iv) In the case of **major** students - to obtain a total of at least 44 (BSc) or 45 (BA) semester hours of credit in upper division courses of which at least 30 hours must be in upper division Mathematics (*MATH*), Statistics (*STAT*), *Actuarial Mathematics (ACMA)*, or Mathematics/Computing Science (MACM) courses; ...
- (v) In the case of **honors** students - to obtain a total of at least 60 semester hours of credit in upper division courses of which at least 50 hours must be in upper division Mathematics (*MATH*), Statistics (*STAT*), *Actuarial Mathematics (ACMA)*, or Mathematics/Computing Science (MACM) courses; ...

Here are reasons supporting this change.

- (1) Other students in this department, i.e. Mathematics minors, and Statistics majors/honors/minors, can use ACMA courses to fulfill their upper division requirements.
- (2) ACMA courses are mathematical courses offered by this department.
- (3) Based on students' comments, the ACMA courses are certainly as demanding as other courses offered by this department.
- (4) Mathematics major or honors students at other Universities with actuarial programs (e.g. Waterloo, Concordia, University of Montréal, Laval, Ball State University) can take actuarial courses for credit towards their mathematics degree.
- (5) The ACMA course that is most likely to be taken by Mathematics major or honors students is ACMA 310 which contains interesting applications to "real-life" problems of calculus.
- (6) This will not represent a way out of MATH courses for these students since they have to take 400 division courses usually with 300 division prerequisites in MATH (not ACMA).
- (7) This will simplify the administrative task of advising our students and perhaps of checking the requirements for graduation.

S.95-70 d

Department of Physics

SCUS Reference: SCUS 95 - 18 e
SCAP Reference: SCAP 95 - 60 d

Computing Science Requirements for Physics Majors and Honors

For Information:

Acting under delegated authority of Senate, SCUS has approved the following revisions as detailed in SCUS 95 - 18 e:

PHYS 331 Change of prerequisites
PHYS 431 Change of prerequisites

Physics Department Undergraduate Course and Program Modifications

The following changes to courses and to the Physics Majors and Honors Programs have been approved by the department and should be discussed at the Faculty of Science Undergraduate Curriculum Committee meeting of October 2.

1. Computing Science Requirements for Physics Majors and Honors

Proposal: To add CMPT 101 or CMPT 102 to the Lower Division Requirements for both Physics Majors and Honors Programs and to change the calendar entry on page 166 of the 1995/1996 calendar entitled "Computer Skills"

From: "Computing skills such as those obtained in CMPT 102 will be expected of students entering the second year Physics courses."

To: ""Computing skills such as those obtained in either of the required lower division courses CMPT 101 or 102 will be expected of students entering the second year Physics courses. The Department recognizes that some students become proficient in a high-level programming language such as those taught in CMPT 101 and 102 through self-study. Such individuals should consult the section of the Calendar (page 32) dealing with Course Challenge. "

Rationale: A significant fraction of our students graduate without taking even one formal computer science course. We believe that it is essential that all students attain at least a minimum level of competence in either Fortran (CMPT 102) or C (CMPT 101).