

S.74-75

SIMON FRASER UNIVERSITY

MEMORANDUM

To SENATE

From SENATE COMMITTEE ON UNDERGRADUATE  
STUDIES

Subject DEPARTMENT OF BIOLOGICAL SCIENCES -  
NEW COURSE PROPOSALS, MARINE SCIENCE

Date MAY 14, 1974

MOTION: "That Senate approve, as set forth in S.74-75,  
the new course proposals for:

MASC 411-6 - Comparative Embryology of Marine  
Invertebrates  
MASC 412-6 - Biology of Fishes  
MASC 435-6 - Introduction to Biological  
Oceanography."

If the above motion is approved,

MOTION: "That Senate waive the normal two semester time  
lag requirement in order that these courses may  
be first offered in the Summer 1974."

S.74-75

# SIMON FRASER UNIVERSITY

## MEMORANDUM

To <u>SENATE</u>	From <u>SENATE COMMITTEE ON UNDERGRADUATE STUDIES</u>
Subject <u>DEPARTMENT OF BIOLOGICAL SCIENCES NEW COURSE PROPOSALS, MARINE SCIENCE</u>	Date <u>MAY 14, 1974</u>

On the recommendation of the Faculty of Science, the Senate Committee on Undergraduate Studies approved the new Marine Science course proposals, as set forth in SCUS 74-19 for:

MASC 411-6 - Comparative Embryology of  
Marine Invertebrates

MASC 412-6 - Biology of Fishes

MASC 435-6 - Introduction to Biological  
Oceanography

and recommends approval to Senate.

The Committee further recommends that the normal two semester time lag requirement be waived in order that the courses may be first offered in the Summer 1974.

It was made clear that these courses are designed to augment the offerings available at Bamfield, that they have been approved by other universities cooperating in the Bamfield enterprise for offering in Summer 1974, that there was unfortunate delay in clearance at Simon Fraser University, and that approval for offering in Summer 1974 for Simon Fraser University would clear a number of administrative difficulties which would otherwise arise.

SCUS 74-19

SIMON FRASER UNIVERSITY

MEMORANDUM

To..... Dr. I. Mugridge  
..... Chairman, S.C.U.S.  
Subject..... Courses in Marine Science

From..... S. Aronoff *S. Aronoff*  
..... Dean of Science  
Date..... May 1, 1974

I am referring to you, for immediate attention, the attached course proposals, namely Marine Science (MASC) 411, 412 and 435. All three proposals have been approved by the Faculty of Science Executive Committee on behalf of the Faculty, and by our Undergraduate Curriculum Committee.

I trust that they will be referred to Senate at its June Meeting.

SA:erb

Enclosures

# SIMON FRASER UNIVERSITY

## MEMORANDUM

S. Aronoff,

Dean of Science.

Subject..

From.. G. H. Geen, Chairman,  
Department of Biological Sciences.

Date.. March 1, 1974

At a meeting of the faculty of the Department of Biological Sciences on February 28, 1974 we approved the following courses which are to be offered at the Bamfield Marine Station.

### MARINE SCIENCE 411 COMPARATIVE EMBRYOLOGY OF MARINE INVERTEBRATES

A comprehensive study of development of marine invertebrates available at the Bamfield Marine Station including all major phyla and most of the minor phyla. Lectures will cover gametogenesis, fertilization, regeneration, cell lineage, mosaic and regulated development, larval development and metamorphosis of the different groups. Laboratory work will include methods and techniques of obtaining and handling of gametes, preparation and maintenance of larval cultures and observation of development up to metamorphosis if possible. Some selected and clearly defined classical experiments will be performed. Efforts will also be made to study various pelagic larvae.

### MARINE SCIENCE 412 BIOLOGY OF FISHES

Classification, physiology, ecology, behaviour and zoogeography of fishes with particular emphasis on those in the marine environment of the British Columbia coast. Local collections from a variety of habitats will be used for experimental studies.

### MARINE SCIENCE 435 INTRODUCTION TO BIOLOGICAL OCEANOGRAPHY

An introduction to the biology of the oceans, with supporting coverage of relevant physics and chemistry. Emphasis will be placed on plankton biology, community structure and life histories, and influencing environmental factors. Collections will be made from sheltered inlets, through Barkley Sound to offshore waters. The course will involve both field and laboratory studies of plankton organisms.

I would be grateful for early consideration of these courses at the Faculty level since two of them are to be offered this summer and I expect that some of our students will be anxious to take them.

Memorandum to Dean Aronoff

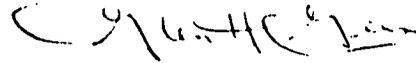
. . . .

- 2 -

March 1, 1974

I am very excited about these courses. They will certainly complement our present marine offerings in areas that we are not likely to be able to offer on campus for some time.

If any additional information is required, please let me know.



Glen H. Geen,  
Chairman.

GHG:ct

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Biological Sciences

Abbreviation Code: MASC Course Number: 411 Credit Hours: 6 Vector: \_\_\_\_\_

Title of Course: Comparative Embryology of Marine Invertebrates

Calendar Description of Course:

A comprehensive study of development of marine invertebrates available at the Bamfield Marine Station including all major phyla and most of the minor phyla. Lectures will cover gametogenesis, fertilization, regeneration, cell lineage, mosaic and regulated development, larval development and metamorphosis of the different groups. Laboratory work will include methods and techniques of obtaining and handling of gametes, prepara-  
Nature of Course (CONTINUED OVERLEAF).....

Lecture/Laboratory  
Prerequisites (or special instructions):

Biology 203-3 and Biology 306-3 or 316-3.

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 second or third summer

Semester in which the course will first be offered? 74-2

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

3. Objectives of the Course

This course will be offered at the Bamfield Marine Station as part of the course offerings in the marine sciences being developed by representatives from five B.C. and Alberta Universities. This course complements very nicely our present undergraduate curriculum in biology.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

- Faculty This course is to be offered at Bamfield by faculty appointed by
- Staff the Bamfield Marine Station. Representatives from this University
- Library are involved in the choice of the faculty and the scheduling of
- Audio Visual courses.
- Space
- Equipment

5. Approval

Date: March 1 / 74 P/M. J / 72. \_\_\_\_\_

S. North-H... P. ... \_\_\_\_\_  
Department Chairman Dean Chairman, SCUS

1. Calendar Information (continued)

tion and maintenance of larval cultures and observation of development up to metamorphosis if possible. Some selected and clearly defined classical experiments will be performed. Efforts will also be made to study various pelagic larvae.

Calendar Description

A comprehensive study of development of marine invertebrates available at the Banfield Marine Station, including all major phyla and most of the minor phyla. A total of 25 or 30 lectures, covering gametogenesis, fertilization, regeneration, cell lineage, mosaic and regulated development, larval development and metamorphosis of different groups will be given. Laboratory work will include methods and techniques of obtaining and handling of gametes, preparation and maintenance of larval cultures, and observations of development up to metamorphosis if possible. Some selected and clearly defined classical experiments will be performed. Efforts will be made also to study various pelagic larvae.

It is hoped that such a broad approach will provide the student with the fundamental framework required for independent analytical studies.

Course Content (as in above)

For major and minor phyla lectures will cover:

- gametogenesis
- fertilization
- regeneration
- cell lineage
- mosaic and regulated development
- larval development
- metamorphosis

Labs will be utilized to supplement lecture material and, in addition, will study:

- methods and techniques of obtaining and handling of gametes
- preparation and maintenance of larval cultures
- selected classical experiments

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Biological Sciences

Abbreviation Code: MASC Course Number: 412 Credit hours: 6 Vector: \_\_\_\_\_

Title of Course: Biology of Fishes

Calendar Description of Course:

Classification, physiology, ecology, behaviour and zoogeography of fishes with particular emphasis on those in the marine environment of the British Columbia coast. Local collections from a variety of habitats will be used for experimental studies.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

Biology 316-3.

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 second or third summer.

Semester in which the course will first be offered? 74-2

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

3. Objectives of the Course

This course will be offered at the Bamfield Marine Station as part of the course offerings in the marine sciences being developed by representatives from five B.C. and Alberta Universities. This course complements very nicely our present undergraduate curriculum in biology.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty This course is to be offered at Bamfield by faculty appointed by the Bamfield Marine Station. Representatives from this University  
Staff are involved in the choice of the faculty and the scheduling of  
Library courses.

Audio Visual

Space

Equipment

5. Approval

Date: *Sydney Green* \_\_\_\_\_

March 1/74

Department Chairman

*S. Muir* \_\_\_\_\_

9/May/74  
*J. Moran*

Chairman, SCUS

Calendar Description

An introduction to the biology of the oceans, with supporting coverage of relevant physics and chemistry. Emphasis will be placed on plankton biology, community structure and life histories, and influencing environmental factors. Collections will be made from sheltered inlets, through Barkley Sound to offshore waters. The course will involve both field and laboratory studies of plankton organisms.

Course Content

An integrated lecture-field-lab approach will be utilized to introduce students to the biology of the oceans. Emphasis will be on examining interrelationships between biotic distributions and oceanographic factors. General topics to be covered include:

Oceanographic Factors - currents  
waves  
illumination  
temperature  
salinity  
dissolved oxygen  
nutrients

Biological Factors - species identification  
life histories  
distribution  
community organization  
diel migrations  
seasonal trends  
functional attributes

# SIMON FRASER UNIVERSITY

## MEMORANDUM

To Dr. J. S. Barlow Associate Dean of Science.	From Dr. G. H. Geen, Dept. of Biological Sciences.
Subject Marine Science Courses	Date March 20, 1974.

Reference is made to your memorandum of March 7 in which you requested additional information on the Marine Sciences courses to be offered at the Bamfield Marine Station.

I have assembled some additional data based on discussions with members of the WCUMBS Academic Sub-Committee, the group responsible for developing the courses and defining their content.

Marine Science 411. Comparative Embryology of Marine Invertebrates.  
 6 semester hours credit. 6 hrs. lecture, 16 hrs. lab per week.

<u>Subject</u>	<u>Hours of lectures</u>	<u>Hours of Laboratories</u>
Gametogenesis	4	12
Fertilization	4	12
Regeneration	5	12
Cell Lineage	5	12
Mosaic and Regulated Development	7	12
Larval Development	7	16
Metamorphosis	7	16
Methods of Handling Gametes		4
Preparation of Cultures		8

Marine Science 412. Biology of Fishes.  
 6 semester hours credit. 6 hrs. lecture, 16 hrs. lab per week.

<u>Subject</u>	<u>Hours of lectures</u>	<u>Hours of laboratories</u>
External and Internal Comparative Anatomy	6 )	24
Functional Morphology	6 )	
Reproductive Patterns and Life Histories	4	8
Community and Population Ecology	4	16
Parasitology	1	2
Pathology	1	2
Systematics and Evolution	5 )	8
Speciation	2 )	
Classification	2	16
Behaviour	3	12
Physiology	5	12
Collecting Methodology		4

PLEASE READ  
AND INITIAL

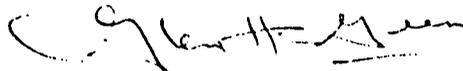
DEAN	f
C. DEAN	JCB



Marine Science 435. Introduction to Biological Oceanography.  
6 semester hours credit, 6 hrs. lectures, 16 hrs. lab per week.

<u>Subject</u>	<u>Hours of Lectures</u>	<u>Hours of Laboratories</u>
Oceanographic Factors		
Currents	2	-
Waves	2	-
Illumination	2	4
Temperature	2	4
Salinity	2	4
Dissolved Oxygen	2	4
Nutrients	4	8
Biological Factors		
Species Identification	1	20
Life Histories	3	-
Distribution	3	8
Community Organization	4	16
Diel Migrations	4	12
Seasonal Trends	4	8
Functional Attributes	4	8
Methodology	-	8

Hopefully this will provide you with sufficient information relating to course content and subject matter emphasis. Undoubtedly there will be some deviations from these outlines which relates to the particular interests of the faculty teaching these courses. However, I would not expect this to result in a major change in the emphasis.



Glen H. Geen,  
Chairman.

GHG/ms



SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Biological Sciences

Abbreviation Code: MASC Course Number: 435 Credit Hours: 6 Vectors: \_\_\_\_\_

Title of Course: Introduction to Biological Oceanography.

Calendar Description of Course: An introduction to the biology of the oceans, with supporting coverage of relevant physics and chemistry. Emphasis will be placed on plankton biology, community structure and life histories, and influencing environmental factors. Collections will be made from sheltered inlets, through Barkley Sound to offshore waters. The course will involve both field and laboratory studies of plankton organisms.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

Biology 204, Biology 306-3 or Biology 326-3.

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 second or third summer.

Semester in which the course will first be offered? 75-2

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

3. Objectives of the Course

This course will be offered at the Bamfield Marine Station as part of the course offerings in the marine sciences being developed by representatives from five B.C. and Alberta Universities. This course complements very nicely our present undergraduate curriculum in biology.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty This course is to be offered at Bamfield by faculty appointed by the Bamfield Marine Station. Representatives from this University  
Staff are involved in the choice of the faculty and the scheduling of  
Library courses.

Audio Visual

Space

Equipment

5. Approval

Date: Jan. 1/74 9/11/74 \_\_\_\_\_

[Signature]  
Department Chairman

[Signature]  
Dean

Chairman, SCUS

Calendar Description

Classification, physiology, ecology, behaviour and zoogeography of fishes with particular emphasis on those in the marine environment of the British Columbia coast. This course will involve field trips.

Course Content

Local collections from a variety of habitats will be used for experimental studies as well as illustrative material for lectures. An integrated lecture-lab approach will cover the following aspects of fish biology:

- external and internal comparative anatomy
- functional morphology
- reproductive patterns and life histories
- community and population ecology
- parasitology
- pathology
- systematics and evolution
- speciation
- classification
- behaviour (reproduction, schooling, homing, etc.)
- physiology (circulation, respiration, osmo-  
regulation, metabolism, etc.)
- collecting methodology and specimen preparation