S.75-181

SIMON FRASER UNIVERSITY

MEMORANDUM

To: SENATE

From: SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Subject: NEW COURSE PROPOSAL - BICH 412-3

Date: NOVEMBER 13, 1975

MOTION: "That Senate approve and recommend approval to the Board of Governors, as stated in S.75-181, BICH 412-3 - Enzymology."

(Note: If BICH 412-3 is introduced, BICH 411-2 will be discontinued.)

SIMON FRASER UNIVERSITY

S.75-181

MEMORANDUM

To SENATE

From SENATE COMMITTEE ON UNDERGRADUATE STUDIES

Subject New Course Proposal - BICH.412-3

Date November 13th, 1975

Action taken by the Senate Committee on Undergraduate Studies at its meeting of November 12th, 1975 gives rise to the following motion:

MOTION

That Senate approve and recommend approval to the Board of Governors BICH. 412-3 - Enzymology.

Daniel R. Birch

:ams

att.

SIMON FRASER UNIVERSITY SCUS 75-46

MEMORANDUM

To: H. Evans Secretary of SCUS	From: S. Aronoff Dean of Science
Subject: NEW COURSE PROPOSAL BICH 412-3	Date: October 29, 1975

* At its meeting of October 28, 1975, the Faculty of Science approved the proposal for a new course BICH 412-3, Enzymology. This course represents the addition of one weekly lecture to the already-existing lab course, BICH 411-2, and will replace that course.

The supporting documentation is forwarded herewith for consideration by SCUS.

/pel

Encl.

* If the above proposal is approved, it will have the effect of changing the calendar entry for BISC 401-3 as follows:

Delete: BICH 411-2 will ordinarily be taken concurrently, but may be taken subsequent to BISC 401-3.

Add: BICH 412-3 will ordinarily be taken concurrently, but may be taken subsequent to BISC 401-3.

Secretary's Note:
If BICH 412-3 is added, drop BICH 411-2

(B-75-13)
(U-75-18)

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Program ~~Department~~: Biochemistry

Abbreviation Code: BICH Course Number: 412 Credit Hours: 3 Vector: 1-0-4

Title of Course: Enzymology

Calendar Description of Course: Enzyme isolation and assay procedures; energy of activation; enzyme kinetics and inhibition; mechanisms of enzymic reactions; allosteric enzymes.

Nature of Course Lecture/Laboratory

Prerequisites (or special instructions):

BICH 301-3 (or BISC 301-3) and BICH 311-2 (or BICH 312-2)
Students with credit for BICH 411-2 may not take this course for further credit.

What course (courses), if any, is being dropped from the calendar if this course is approved: BICH 411-2

2. Scheduling

How frequently will the course be offered? Once a year

Semester in which the course will first be offered? 76-3

Which of your present faculty would be available to make the proposed offering possible?
W.R. Richards, S. Aronoff, J.S. Barlow, R.J. Cushley

3. Objectives of the Course The addition of one lecture per week to the currently existing enzymology laboratory course (BICH 411-2) is the best way to correlate lecture material with laboratory work. The lecture material does not fit conveniently into any of the existing lecture courses. Attempts to do so have led to serious scheduling problems with the corresponding laboratory course.

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty Nil

Staff Nil

Library Nil

Audio Visual Nil

Space Lecture (1/wk); laboratory space is available in C9014

Equipment
(See attached sheet on Laboratory Experiments)

5. Approval

Date: Oct 20/75 — 29 O 75

J.S. Barlow
~~Department Chairman~~
Committee Chairman

Dean

Chairman, SCUS

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

Biochemistry 412-3 Enzymology (1-0-4)

Lecture	Topic
1	Reaction rate theory; energy of activation
2	Enzyme denaturation; discussion of entropy effects
3	Enzyme assay procedures; methods of determining enzyme quality and quantity; optimum conditions of assay (pH, temperature, and concentration).
4	Review of chemical kinetics; the steady-state approximation and complex formation.
5	Enzyme kinetics; Michaelis-Menton and Lineweaver-Burk treatments
6	Enzyme inhibition (I)
7	Enzyme inhibition (II)
8	Fast reaction kinetics
9	Studies on monosubstrate reaction mechanisms
10	Studies on bisubstrate reaction mechanisms
11	Sigmoidal kinetics
12	Allosteric enzymes (I)
13	Allosteric enzymes (II)

BICH 412-3, Enzymology

Laboratory Experiments

It is anticipated that quite a bit of freedom will be allowed for the students in choosing laboratory experiments, as is currently the case for BICH 411-2. The student will choose an enzyme, from a list of possibilities, which he or she wishes to isolate and purify. He/she will then carry out enzyme assays and other enzymic studies on his/her isolated enzyme. (If no activity is obtained, he/she may be given a commercially obtained enzyme for his/her enzymic studies.) These studies could include:

1. Energy of activation, devaluation and pH optimum.
2. Enzyme kinetics: Michaelis-Menton and Lineweaver-Burk treatments.
3. Enzyme inhibition.

The experiments should take about 2/3 of the semester. For the remaining 1/3, experiments in advanced areas of enzymology are planned. Again, the student would have freedom in selecting the experiments, which would include:

1. Bisubstrate reaction mechanisms

2. Allosteric enzymes

3. Fast reaction kinetics

The latter experiment would require a stopped-flow or relaxation kinetics apparatus. Such an apparatus will not be available for Fall 1976 but funds will be sought in the budget for Fall 1977. A good portion of the apparatus can be built in the SFU workshop.