

SIMON FRASER UNIVERSITY

S.78-152

MEMORANDUM

To.....Senate.....

From....N.R..Reilly,,Chairman.....
Senate Committee on
.....Undergraduate Studies.....

.....
New Course Proposal - Nuclear
Subject Science 485-3 and proposed
redesignation of CHEM 442-3
as Nuclear Science 442-3.

Date....15 November 1978.....

Action by the Senate Committee on Undergraduate Studies at its meeting on November 14 gives rise to the following motion:

MOTION

That Senate approve and recommend approval to the Board of Governors the proposals relating to the introduction of Nuclear Science courses as outlined below and detailed in S78-152:

- i) The introduction of a new course NUSC 485-3, Particle Physics.
- ii) Deletion of PHYS 471-4, Nuclear Physics.
- iii) The renaming of CHEM 442-3, Nuclear Chemistry as NUSC 442-3, Properties of Nuclear Matter and prerequisite change
- iv) That these courses appear in both the Chemistry and Physics sections of the calendar.
- v) That these courses be available as upper division options for degree programs in Chemistry Minor, Major and Honors programs and also Chemical Physics Major and Honors programs.

Norman R. Reilly
N.R. Reilly

/kb

SIMON FRASER UNIVERSITY

MEMORANDUM

To..... H.M. Evans, Registrar

..... Registrar's Office

Subject Nuclear Science Courses

From J.M. Webster

..... Dean of Science

Date 1978 11 16

Further to my memorandum of 78-10-02, the Faculty of Science approved a prerequisite change for the course NUSC 442-3, (previously designated CHEM 442-3). This should read:

"CHEM 361-3 or PHYS 385-3 or permission of the Department."

This would enable students in either Chemistry or Physics programmes to have access to the course.

In addition the Faculty of Science recommended that the courses NUSC 442-3 and NUSC 485-3 be admissible as upper division optional courses in lieu of upper division PHYS or CHEM courses in the following programmes:

Chemistry - Honours, Major, Minor
Chemical Physics - Honours, Major


J.M. Webster

JMW/km

SIMON FRASER UNIVERSITY

SCUS 78-48

MEMORANDUM

To.....	H.M. Evans, Secretary of SCUS	From.....	J.M. Webster
Subject.....	New Course Proposal Nuclear Science 485-3 and Proposed Redesignation of CHEM 442-3 as Nuclear Science 442-3	Dean of Science
		Date.....	1978 10 02

The Faculty of Science, at its meeting of 1978 09 28, approved the following:

1. To approve the proposed new course Nuclear Science 485-3, "Particle Physics".
2. To delete PHYS 471-4, "Nuclear Physics".
3. CHEM 442-3, "Nuclear Chemistry", be renamed Nuclear Science 442-3, "Properties of Nuclear Matter".

RATIONALE

There has been considerable discussion between Physics and Chemistry recently with the aim of removing the substantial overlap between CHEM 442, "Nuclear Chemistry" and a proposed course in subatomic physics. In fact, there are faculty in both departments whose expertise qualifies them to teach the course out of their departments. Recognizing this dual competence, the Physics Department revised the content of its proposed subatomic physics course and the Chemistry Department renamed Chem 442 to "Properties of Nuclear Matter". Further, the Departments have agreed that the two courses be renamed to:

Nuclear Science 442-3, "Properties of Nuclear Matter", and
Nuclear Science 485, "Particle Physics",

and that the courses would appear in both Chemistry and Physics sections of the Calendar.

The Honours Physics requirements have been revised so that students will be allowed a choice of Nuclear Science 442 and Nuclear Science 485.

Each course would be taught once per year, probably Nuclear Science 442 in the Fall and Nuclear Science 485 in the Spring.

This co-operative effort will increase the contact between the departments in nuclear science (it has already done this) and we think

The resources and scheduling for these courses will be the responsibility of the instructor's home department, e.g. in the case of NUSI 485-3, the Physics Department when Dr. Viswanathan teaches the course and the Chemistry Department when the course is offered by Dr. Boal.


J.M. Webster

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

~~NEW~~ COURSE PROPOSAL FORM - CHANGE IN TITLE AND PREREQUISITE

1. Calendar Information

Department: Chemistry or Physics

Abbreviation Code: NUSC Course Number: 442 Credit Hours: 3 Vector: 3-1-0

Title of Course: Properties of Nuclear Matter

Calendar Description of Course:

Study of nuclear structures and systematics. Nuclear decay processes. Nuclear models and nuclear reactions.

Nature of Course Lecture / Tutorial

Prerequisites (or special instructions):

CHEM 361-3 or PHYS 385-3 or 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? Approximately once per year

Semester in which the course will first be offered?

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

D. Boal, Chemistry A. S. Arrott, Physics and other faculty

3. Objectives of the Course

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty

Staff

Library NONE

Audio Visual

Space

Equipment

5. Approval

Date: Nov. 16, 78 15/11/78 15 Nov 78

[Signature] Department Chairman [Signature] Dean [Signature] Chairman, SCUS

SENATE COMMITTEE ON UNDERGRADUATE STUDIES

NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: Physics or Chemistry

Abbreviation Code: NUSC Course Number: 485 Credit Hours: 3 Vector: 3-1-0

Title of Course: Particle Physics

Calendar Description of Course:

Physics of elementary particles, Symmetries, strong interactions, electromagnetic interactions, weak interaction.

Nature of Course Lecture / Tutorial

Prerequisites (or special instructions):

PHYS 385-3 or CHEM 361-3 or permission of the Department

PHYS 415-3 is a recommended prerequisite

What course (courses), if any, is being dropped from the calendar if this course is approved: PHYS 471-4, Nuclear Physics

2. Scheduling

How frequently will the course be offered? Once per year

Semester in which the course will first be offered?

Which of your present faculty would be available to make the proposed offering possible? K.S. Viswanathan (Physics); D. Boal (Chemistry)

3. Objectives of the Course

A survey of the physics of elementary particles

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas:

Faculty

Staff

Library

Audio Visual NONE

Space

Equipment

5. Approval

Date: Nov 16, 78 16/11/78 15 Nov 78

K.S. Viswanathan
Department Chairman

[Signature]
Dean

[Signature]
Chairman, SCUS

Course Outline

Nuclear Science 485-3 - Particle Physics

Course Content: A review of elementary particle decay and reaction phenomenology followed by a comparison with some standard models for each of the topics:

1. Symmetries

- review of experimental evidence for particle quantum numbers.
- SU(n) classification schemes and mass formulae
- quark model

2. Strong interactions

- scattering and reaction theory
- hadron-hadron scattering phenomenology
- Regge poles, S-matrix theory
- quantumchromodynamics

3. Electromagnetic interactions

- electromagnetic decays of hadrons
- electromagnetic form factors and photoproduction experiments
- introduction to quantumelectrodynamics

4. Weak interactions

- beta decay phenomenology
- four-point model
- gauge theories
- neutrino scattering

Texts

"Subatomic Physics" by Frauenfelder and Henley or "Introduction to Elementary Particle Physics" by Williams.