

# SIMON FRASER UNIVERSITY

S.72-54

## MEMORANDUM

To SENATE

From J. WHEATLEY, DEAN

GRADUATE STUDIES

Subject NEW GRADUATE COURSES - CHEMISTRY

Date APRIL 19, 1972

MOTION: "That the three new Chemistry Graduate Courses, Chem 600-5, 601-5 and 602-5, be approved."

(Note: These courses are designed for students undertaking an M.Sc. (Ed.) degree and do not carry credit for the Master's degree in the Faculty of Science.)

To: Senate

From: J. Wheatley  
Dean  
Graduate Studies

Subject: Chemistry Graduate Course  
Proposals

Date: April 19, 1972

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MOTION: "That the three new Chemistry Graduate  
Courses, Chem 600-5, 601-5 and 602-5,  
be approved".

These courses were approved by the Executive Committee  
of the Senate Graduate Studies Committee at its meeting  
on April 17, 1972.

*J. V. Wheatley/mm*  
J. Wheatley  
Dean  
Graduate Studies.

/mm

# SIMON FRASER UNIVERSITY

ECS. 40Y

## MEMORANDUM

Harry Evans	From Norman Robinson, Chairman
Registrar	Faculty of Education Graduate Studies Committee
Subject Graduate Program in Chemistry Education	Date March 30, 1972

Dr. Birch has advised me that he would like you to put before the Executive Committee of the Senate Graduate Studies at its next meeting the Graduate Program in Chemistry Education.

The Chemistry course component needs approval and I will be pleased to speak on the question of the impending renumbering and retitling of the courses in education.

For the benefit of any of the committee members who may want to ask questions, perhaps you should invite a representative of the Chemistry Department to attend the meeting.

Norman Robinson

NR:ah

# SIMON FRASER UNIVERSITY

## MEMORANDUM

Mr. H. Ebons, Secretary

Senate Graduate Studies Committee

Subject Chemistry Graduate Course Proposals

From S. Aronoff

Dean of Science

Date March 22, 1972

The attached proposals for three new Chemistry Graduate Courses, Chem 600-5, 601-5 and 602-5, have been approved by the Faculty of Science at its meeting on March 21, 1972, and are now being sent for the consideration of the Senate Graduate Studies Committee and Senate.

1a

Enclosures

## SIMON FRASER UNIVERSITY

10/7/72

## MEMORANDUM

Dean of the Faculty of Science.

from D. Sutton, Chairman,  
Department Graduate Studies Committee  
Department of Chemistry.

Subject Course Proposal.

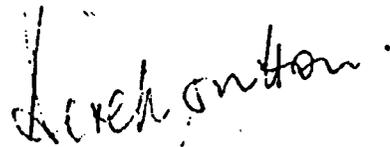
Date 29th February, 1972

Attached are course proposals for three new Chemistry Graduate Courses, Chem 600-5, 601-5 and 602-5. These courses have the approval of the Chemistry Department and it is intended that they be offered only in conjunction with and as "service courses" for the proposed program in Chemistry Education, leading to the M.Sc. (Education) degree in the Faculty of Education. An outline of this program as it is presently defined is attached for your information.

Faculty of Science approval of these Chemistry courses is required so that planning of the Chemistry Education Program can be finalised by the Faculty of Education.

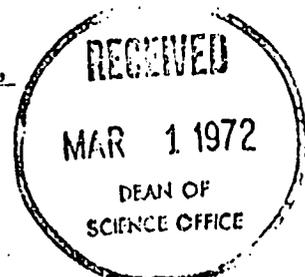
I wish to emphasise that:

- a) This proposal is quite distinct from and does not overlap with the "Chemical Education option" in the M.Sc. degree as offered by the Chemistry Department.
- b) The courses 600, 601 and 602 will not be available for credit to graduate students in the Faculty of Science, as they are specifically designed for the candidates in the M.Sc. (Ed.) program - practicing teachers.



D. Sutton.

Passed by the Graduate Studies Committee of the Faculty of  
Science at its meeting of March 10,  
1972.

DS/db  
Enc.

1. CALENDAR INFORMATION:

Department: Chemistry Course Number: 600 \*  
 Title: Selected Topics in Modern Chemistry I  
 Description: See attached Section A

Credit Hours: 5 Vector: I-I-3 Prerequisite(s) if any: \_\_\_\_\_

\* ~~This course is a duplicate of course 600 or 800 which is employed by the Department of Chemistry. It is not recommended for credit.~~

2. ENROLLMENT AND SCHEDULING:

Estimated Enrollment: 10-15 When will the course first be offered: Fall, 1972  
 How often will the course be offered: Once every two years.

3. JUSTIFICATION:

This course is part of the Graduate Program in Chemistry Education which will allow secondary school teachers to obtain the M.Sc. (Education) degree in an evening program. As such, this is a service course as part of a package offered in cooperation with the Faculty of Education.

4. RESOURCES:

A team approach will be utilized and for the first offering the following will contribute:  
 Which Faculty member will normally teach the course: S.K. Lower, B.D. Pate, J.D'Auria, A.G. Sherwood, A.C. Oehlschlager, D. Sutton,  
 What are the budgetary implications of mounting the course: L.K. Petersen.  
\$1,200 personnel.  
\$1000 materials. First presentation as a Faculty overload.

If program successful 1/2 semester appointment in 1974.

Are there sufficient Library resources (append details): Yes

- Appended: a) Outline of the Course  
 b) An indication of the competence of the Faculty member to give the course  
 c) Library resources

Approved: Departmental Graduate Studies Committee: [Signature] Date: 2/25/72

Faculty Graduate Studies Committee: [Signature] Date: March 15/72

Faculty: [Signature] Date: 2/25/72

Senate Graduate Studies Committee: \_\_\_\_\_ Date: \_\_\_\_\_

Senate: \_\_\_\_\_ Date: \_\_\_\_\_

## ATTACHMENTS

### A - Description

A lecture and laboratory course to explore in depth the major subject areas of chemistry, and the methodology of teaching such areas, with particular emphasis on the subject matter and the experimental work of chemistry 11 and 12. Recent advances in these areas will be presented, including a treatment of instrumentation employed in analytical and other research studies. Experiments presently in the Chem. 11-12 program will be critically evaluated, and new complimentary laboratory studies and audio visual material will be devised.

Chemistry 600-5

#### Outline of Course

This is an evening course which will be offered once a week from 4:30 to 9:30 p.m. as part of the M.Sc. (Education) Graduation Program in Chemistry Education. The intent of this course is to cover such topics as stoichiometry, Kinetic theory of gases, chemical energies, equilibrium, atomic structure, chemical bonding and periodic properties of the elements rigorously, as background to the material taught in secondary schools.

In addition, recent advances in these areas will be discussed and a laboratory session will be integrated to cover related experimental work. A tutorial session will also be included and all topics will be analyzed from the point of view of teaching the material. Some time will be spent on developing audio-visual and self-study material.

#### Faculty

A team teaching approach will be used and the faculty members initially involved will be Dr. S.K. Lower, Dr. J.M. D'Auria, Dr. A.G. Sherwood, Dr. B.D. Pate, Dr. L.K. Peterson, Dr. D. Sutton, and Dr. A.C. Oehlschlager. These individuals as a unit have demonstrable competence in the areas of chemical education, teaching and chemical research.

1. CALENDAR INFORMATION:

Department: Chemistry Course Number: 601

Title: Selected Topics in Modern Chemistry II

Description: See attached Section A

Credit Hours: 5 Vector: 1-1-3 Prerequisite(s) if any: 600-5

2. ENROLLMENT AND SCHEDULING:

Estimated Enrollment: 10-15 When will the course first be offered: Spring, 1972

How often will the course be offered: Once every two years.

3. JUSTIFICATION:

This course is part of the Graduate Program in Chemistry Education which will allow secondary school teachers to obtain the M.Sc. (Education) degree in an evening program. As such, this is a service course as part a package offered in cooperation with the Faculty of Education.

4. RESOURCES:

A team approach will be utilized and for the first offering the following will contribute:

Which Faculty member will normally teach the course: S.K. Lower, B.D. Pate, J.D. Auria, A.C. Sherwood, A.C. Oehlschlager, D. Sutton, L.K. Peterson

What are the budgetary implications of mounting the course: \$1000 Materials. Part-time appointment \$3,000. If successful

1/2 semester appointment in 1975.

Are there sufficient Library resources (append details): Yes

- Appended: a) Outline of the Course
- b) An indication of the competence of the Faculty member to give the course
- c) Library resources

Approved: Departmental Graduate Studies Committee: [Signature] Date: 5/26/72

Faculty Graduate Studies Committee: [Signature] Date: 5/15/72

Faculty: [Signature] Date: 5/16/72

Senate Graduate Studies Committee: \_\_\_\_\_ Date: \_\_\_\_\_

Senate: \_\_\_\_\_ Date: \_\_\_\_\_

## ATTACHMENTS

### A - Description

A lecture and laboratory course to explore in depth the major subject areas of chemistry, and the methodology of teaching such areas, with particular emphasis on the subject matter and the experimental work of Chemistry 11 and 12. Recent advances in these areas will be presented, including a treatment of instrumentation employed in analytical and other research studies. Experiments presently in the Chem. 11/12 program will be critically evaluated, and new chemistry laboratory studies and audio-visual material will be devised.

Chemistry 601-5

#### Outline of Course

This is an evening course which will be offered once a week from 4:30 to 9:30 p.m. as part of the M.Sc. (Education) Graduate Program in Chemistry Education. The topics presented will include periodic properties of the elements, thermodynamics, phases of matter, electro-chemistry, nuclear and organic chemistry, as background to the material taught in secondary schools.

In addition, recent advances in these areas will be discussed and a laboratory session will be integrated to cover related experimental work. A tutorial session will also be included and all topics will be analyzed from the point of view of teaching the material. Some time will be spent on developing audio-visual and self-study material.

#### Faculty

A team teaching approach will be used and the faculty members initially involved will be Dr. S.K. Lower, Dr. J.M. D'Auria, Dr. A.G. Sherwood, Dr. B.D. Pate, Dr. L.K. Peterson, Dr. D. Sutton, and Dr. A.C. Oehlschlager. These individuals as a unit have demonstrable competence in the areas of chemical education, teaching and chemical research.



## ATTACHEMENTS

### A - Description

A seminar course involving the study and discussion of topics of interdisciplinary and chemical interest. A flexibility of approach is envisaged, with the choice of topics evolving according to the interest of the candidate; general subject areas could include bio-chemistry, industrial chemistry, environmental studies, geo chemistry, cosmochemistry, chemical physics and nuclear chemistry.

Chemistry 602-5

#### Outline of Course

This is an evening course which will be offered once a week from 4:30 to 9:30 p.m. as part of the M.Sc. (Education) Graduate Program in Chemistry Education. It will be presented mainly as a lecture, seminar, tutorial course with department and external guest speakers occasionally presenting material. The topics covered will be interdisciplinary, but chemistry oriented. The point of view will be from both an understanding of the subject and teaching the material. Audio-visual and self-study techniques will be discussed.

#### Faculty

Various faculty from the Department of Chemistry and invited speakers external to the Department.

## FACULTY OF EDUCATION

### Graduate Program in Chemistry Education

#### Introduction

The following brief description of the proposed Graduate Program in Chemistry Education has been generated as a result of discussions between the Faculty of Education and the Department of Chemistry.

The proposed program has not as yet been formally approved by the Faculty of Education but will be submitted for approval shortly.

The proposed program is designed to provide practicing teachers with an opportunity to update their knowledge base in the fields of education and chemistry.

#### Degree to be Awarded

On successful completion of the Graduate Program in Chemistry Education, a candidate will be awarded the degree of Master of Science (Education).

#### Admission Requirements

The Graduate Program in Chemistry Education seeks high calibre candidates who are interested in improving the quality of educational practice in their classrooms. Applicants for admission must be practicing teachers who meet the regular admission requirements to the Faculty of Education. In addition, any requirements imposed by the Department of Chemistry must be met.

The Graduate Program in Chemistry Education will have an initial intake of fifteen students in September, 1972. If fifteen suitable candidates are not identified, the program will not be mounted.

Applications for admission must be made before May 1, 1972. (To be revised)

Applications will be sent to the Faculty of Education for documentation. A joint Faculty of Education - Department of Chemistry committee will rule on the admissibility of candidates, with the final decision for admissibility reserved for the Faculty of Education Graduate Studies Committee.

#### Meeting Times

The Graduate Program in Chemistry Education is designed for practicing teachers whose family and occupational responsibilities require them to continue employment while they undertake graduate work. For this reason, meeting times will be Tuesdays and Thursdays commencing at 4:30 p.m. and continuing through the dinner hour until 9:30 p.m.

#### Program Content, Sequencing and Staffing

To complete the Graduate Program in Chemistry Education and to qualify for the M.Sc. (Education) degree, a candidate will be required to complete a minimum of thirty semester hours of work plus two extended essays.

Program content, sequencing and staffing for the two year period is shown on the following pages. It should be noted that all students must follow the program sequencing that is outlined.

SEMESTER	CALENDAR COURSE NO.	SHORT CONTENT DESCRIPTION	SEMESTER HOURS
FALL 1972	Education 801 *	1. Studies in Teacher- Student interaction and Curriculum Development <sup>1</sup>	5
		2. Selected Topics in Modern Chemistry I <sup>2</sup>	5
SPRING 1973	Education 805 *	3. Teaching Strategies and Educational Objectives <sup>3</sup>	5
		4. Selected Topics in Modern Chemistry II	5
SUMMER 1973	No formal work; private study or course work for remediation or enrichment purposes.		
FALL 1973		5. Interdisciplinary Areas of Chemistry <sup>5</sup>	5
		6. Extended Essay #1 <sup>6</sup>	-
SPRING 1974	Education 808 *	7. Evaluation of Educational Practice	5
		8. Extended Essay #2	-

\* These calendar course numbers may be changed if the proposed re-numbering and relabelling of courses in the Faculty of Education is approved.

Notes:

1. Education 801 - Studies in Teacher - Student Interaction and Curriculum Development.

The focus in this course is on the student's teaching behaviour in his own classroom. The student will examine his teaching behaviour in relationship to teacher-student interaction and curriculum development.

2. See Appendix A for details.

3. Education 805 - Teaching Strategies and Educational Objectives.

In this course, the student will examine the literature and explore the research on teaching objectives. On the basis of readings and discussions, he or she will be helped to formulate educational objectives and develop teaching strategies which are appropriate to his or her educational goals.

4. See Appendix B for details.

5. See Appendix C for details.

6. Extended Essays may be either "education-oriented" or "chemistry-oriented." The normal expectation would be that Extended Essay #1 would be "chemistry-oriented" and Extended Essay #2 would be "education-oriented."

7. Education 808 - Evaluation of Educational Practice.

This course requires the student to examine and assess his or her own professional development in the classroom-as-laboratory. He or she will undertake investigation of the impact of his or her teaching on the behavior of his students, under the direction of a member of the faculty. This investigation will culminate in the student's final project report.

Supervisory Committees

Each candidate will have a Supervisory Committee of two members, one from the Faculty of Education and one from the Department of Chemistry. Initiation and supervision of each candidate's program will be undertaken pursuant to Regulations 5.1 and 5.4 of the Graduate Studies Regulations for the University.