

## SIMON FRASER UNIVERSITY

## MEMORANDUM

**To:** Senate**From:** L. Salter  
Chair, SCAP**Subject:** Department of Chemistry -  
Curriculum revisions  
Reference: SCUS 89-47  
SCAP 89-51**Date:** November 9, 1989

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

**Motion:**

"That Senate approve and recommend approval to the Board of Governors as set forth in S.89-66 the proposed changes to the lower division course offerings including

|             |              |                                       |
|-------------|--------------|---------------------------------------|
| New courses | CHEM 150 - 3 | Organic Chemistry I                   |
|             | CHEM 155 - 2 | Organic Chemistry Laboratory I        |
|             | CHEM 250 - 3 | Organic Chemistry II                  |
|             | CHEM 255 - 2 | Organic Chemistry Laboratory II       |
| Deletion of | CHEM 104 - 3 | General Chemistry I for Life Sciences |
|             | CHEM 251 - 3 | Organic Chemistry I                   |
|             | CHEM 252 - 3 | Organic Chemistry II                  |
|             | CHEM 256 - 2 | Organic Chemistry Laboratory I        |
|             | CHEM 356 - 2 | Organic Chemistry Laboratory II"      |

**For Information:**

Change of title and prerequisite.

Note from Senate Mtg 27/11/89 - Effective date of  
implementation  
Fall Sem. 1991

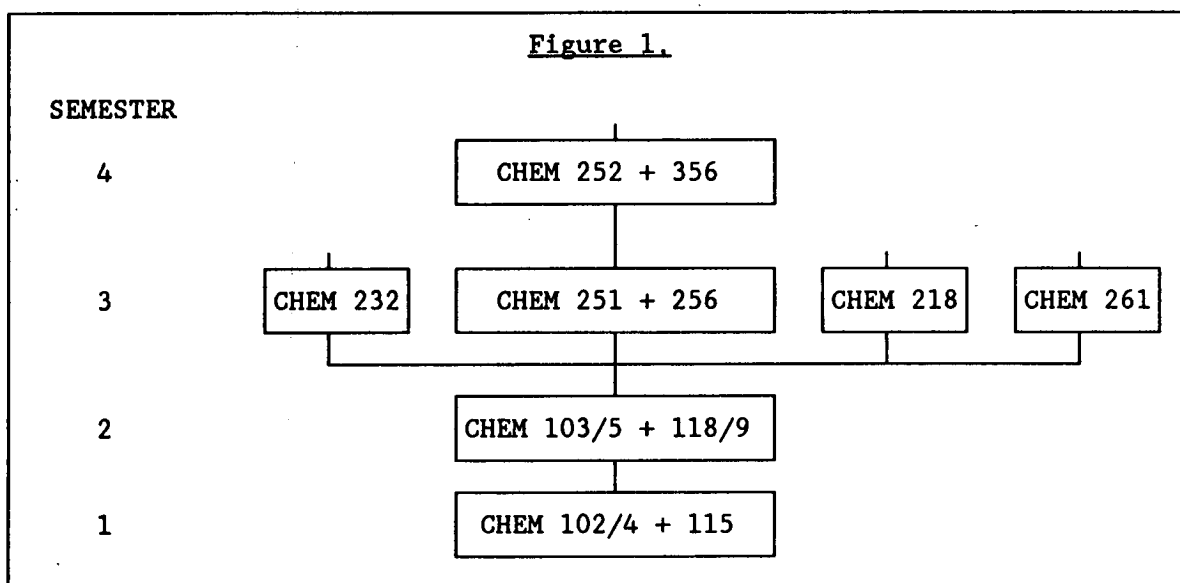
## SIMON FRASER UNIVERSITY

## DEPARTMENT OF CHEMISTRY

In an attempt to revitalize the early part of our undergraduate program, it is proposed to base the two semester organic chemistry sequence upon a single first year General Chemistry course rather than upon two as is the case in the present scheme. This sort of arrangement is presently in operation in some Canadian universities and it was suggested in the report of the most recent Departmental Review Committee.

The Present Program

The present prerequisite structure for a typical first two years of the program is outlined in Figure 1. If two courses are joined by a line, the lower one must be passed before the upper is taken.



The first semester lecture course deals mainly with the properties of gases liquids and solutions and with ideas of atomic structure, chemical bonding and with basic ideas about molecular geometry. This material is not dealt with in the high school curriculum.

The second semester course is a review, at an admittedly higher level, of the concepts developed in the Grade 12 chemistry course. This means that the students have difficulty maintaining an interest in the material that they feel is quite familiar. They would be stimulated by something new.

Normally, only with a grade of B or better can CHEM 105 and CHEM 118 serve as prerequisites for CHEM 218, CHEM 232 and CHEM 261.

Proposed Changes to the Lower Division Course Offerings

The organic and the inorganic chemists agree that CHEM 232 and CHEM 251 could be offered with a prerequisite of one course emphasizing atomic and molecular structure. In other provinces, it has proven possible to offer

Organic Chemistry in the first semester but the "novel" B.C. High School curriculum does not include the treatment of atomic and molecular structure which is necessarily required for the development of organic chemistry.

UBC has increased the amount of organic in their first year program. Our information is that it now amounts to about 25% of the course. In any case, their first year courses are still taught by physical, organic and inorganic chemists with the attendant differences in emphasis.

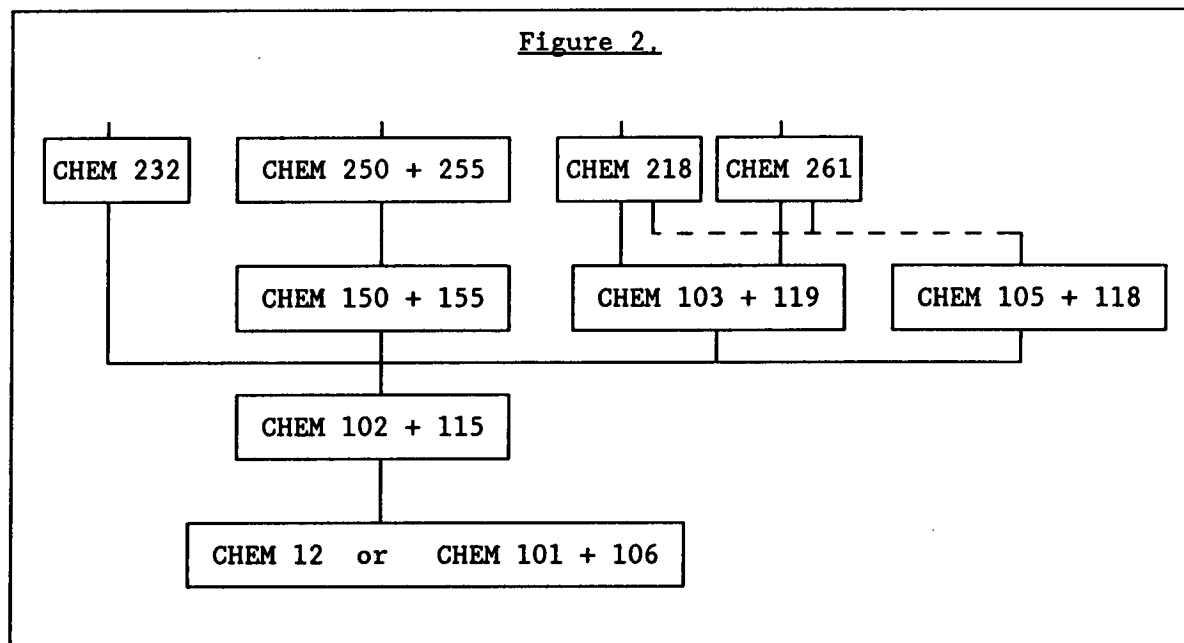
It is proposed to offer the first semester of Organic Chemistry in the second semester of the program with the only prerequisite being CHEM 102 plus CHEM 115. This course, CHEM 150, would have a scope similar to that of the present CHEM 251 and would be accompanied by a lab course, CHEM 155, similar to the present CHEM 256.

The second semester of organic chemistry, CHEM 250, would have the scope of the present CHEM 252 and would be accompanied by a lab, CHEM 255, similar to the present CHEM 356. CHEM 356 has for the past decade or so developed to augment CHEM 252 and so the lab to accompany CHEM 250 should have a 200 division name.

These courses would be presented by the organic chemists.

The second semester of general chemistry would be streamed and the present courses, CHEM 103 + CHEM 119 or CHEM 105 + CHEM 118 would continue to serve as prerequisites for the CHEM 218 and CHEM 261, again with the requirement of a grade of B or better in the case of CHEM 105.

A diagram of the prerequisite structure would then look like that shown in Figure 2.



Details

1. CHEM 101 could be reconstructed to more closely reflect the content of the high school curriculum. It should contain stoichiometry, some acid-base chemistry but no atomic and molecular structure. There will be little stoichiometry in CHEM 102 and the acid-base chemistry upon which the organic courses will be based will be that presented in the high school curriculum. Thus, students who have difficulty in CHEM 102 should be identified very early and encouraged to transfer to CHEM 101.

2. CHEM 102 would be essentially all new material as far as the students are concerned. It would consist of the gas laws followed by the development of theories of nuclear, atomic and molecular structure to serve as a basis for the organic and inorganic chemistry

3. There would continue to be considerable difference between CHEM 105 and CHEM 103 and between their associated labs, CHEM 118 and CHEM 119. CHEM 103 would be for CHEM and BICH students and would be intended to prepare for the second year courses in those programs, i.e., CHEM 218, CHEM 261, and CHEM 232.

There would be little need for repetition of the CHEM 103 material in the following courses. CHEM 103 would be at least a second semester course and more likely a third semester one and students would be taking MATH 152 at least concurrently. The treatment of the First Law of Thermodynamics could be rigorous and repetition in CHEM 261 would not be necessary.

CHEM 105, on the other hand would be a terminal CHEM course for BISC and KINES students. Its form and function would not change markedly from what it is now.

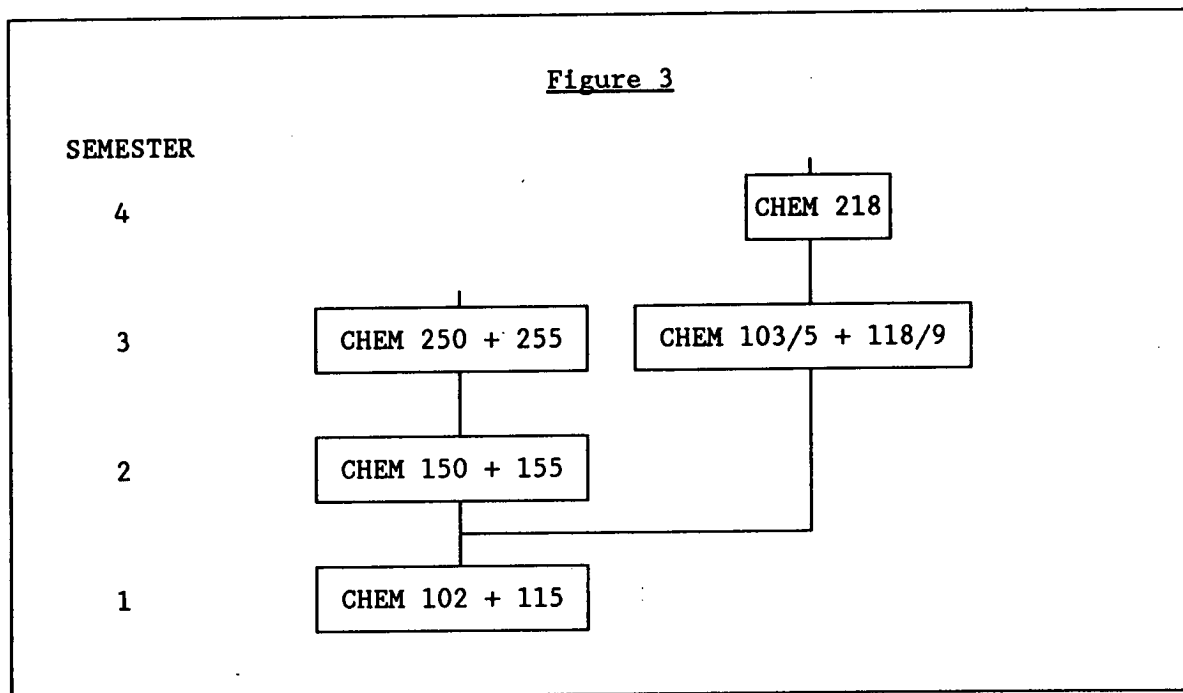
Possible Program Sequences

The organic courses are not prerequisite to CHEM 103 and CHEM 105 and so these latter courses and the organic courses could be taken simultaneously by particularly adventurous students. The general tendency will be to take them in the "proper" order since most students will choose to postpone the more quantitative course to the fourth semester.

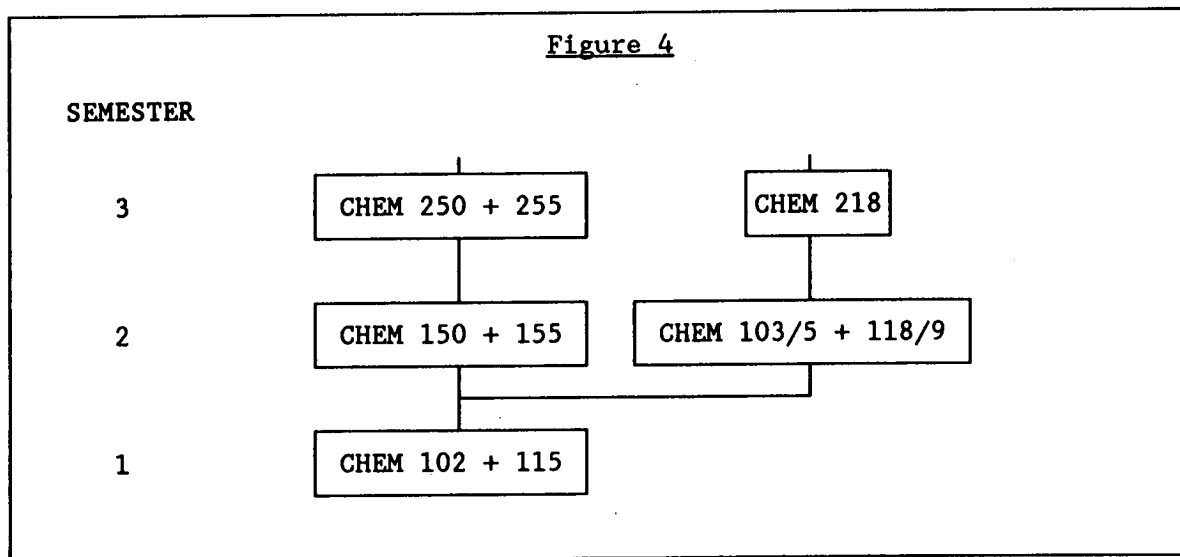
CHEM 105 is not a prerequisite for CHEM 150 and so if life sciences students choose to take only one of the organic courses, they can take CHEM 105 in the third semester.

4.

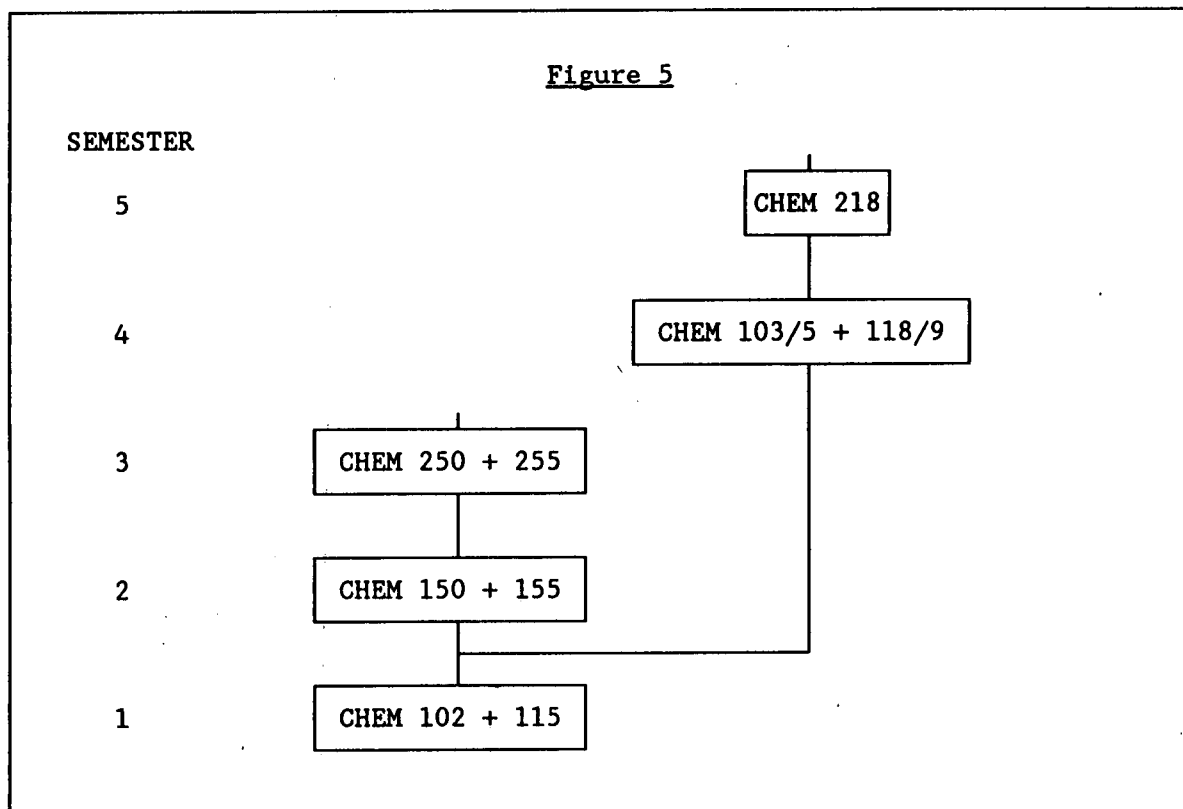
A COOP student could complete CHEM 218, as is presently the case, in the second year, i.e., before his second work term. A schedule which would accomplish this might, neglecting CHEM 232 and CHEM 261, look like that shown in Figure 3.



or, for the very brash, Figure 4.



or, for the very timid, Figure 5.



or, presumably, some adventurous soul could take CHEM 103 + CHEM 119 before CHEM 150 + CHEM 155 which is the present scheme.

#### Advantages of the Changes

1. Students would be taking completely new material for the first three semesters of their university programs. There would be none of the "but-we've-done-all-this" syndrome.
2. Students are presented with organic chemistry which they seem to like early in their careers and confront the more quantitative stuff later after they have had more MATH and PHYS courses.
3. Streaming still takes place but, most commonly, only after students have taken all the courses that are common to both streams, a far more sensible arrangement than our present one in which students are streamed for two semesters and then come together again at least in the first organic course.

## SFU MEMORANDUM

Date: 23 June 1989

To: Alden Sherwood, Ph.D.  
Department of Chemistry

From: Glen Tibbits   
Kinesiology, SFU representative  
UBC Medical School Admissions Selection Committee

Re: SFU Chemistry course revisions

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This memo serves to document our telephone conversations concerning the impact of the proposed revisions of the Chemistry course curriculum on the entrance requirements for UBC Medical School. As you know, I have given the outline of the proposed changes to Dr. J. Carter, Associate Dean of Admissions, who serves as chairman of the Medical School Admissions Selection Committee as well as on the Admissions Policy Committee. Dr. Carter informed me in May that he had brought the outline of the changes to the Admissions Policy Committee and they had informally been approved. It is not known when the "official" approval will be forwarded to SFU. While it is a little disconcerting that this approval is not in writing at this time, we have every indication that you can go ahead without the changes impacting the acceptability of students at SFU for admission into UBC Medical School.

SENATE COMMITTEE ON UNDERGRADUATE STUDIES  
NEW COURSE PROPOSAL FORM

1. Calendar InformationDepartment: CHEMISTRYAbbreviation Code: CHEM Course Number: 102 Credit Hours: 3 Vector: (3-1-0)Title of Course: General Chemistry I

Calendar Description of Course:

- No change -

Nature of Course:

Prerequisites (or special instructions)

B.C.High School Chemistry 12 or CHEM 101-3. CHEM 115 and MATH 151 or MATH 154 should be taken concurrently. Students may not take both CHEM 102 and CHEM 104 for credit.

What course (courses), if any, is being dropped from the calendar if this course is approved? CHEM 104-3

2. Scheduling

How frequently will the course be offered? No change

Semester in which the course will first be offered:

Which of the present faculty would be available to make the proposed offering possible? No change

3. Objectives of the Course

- no change -

4. Budgetary and Space Requirements (for information only)

What additional resources will be required in the following areas?

Faculty

Staff

Library

Audio Visual

Space

Equipment

5. Approval

Date:

July 24 1989CHW. SONS11/1/89

[Signature]  
Department Chairman

Oct. 17 1989  
Dean

[Signature]  
Chairman, SCUS



SENATE COMMITTEE ON UNDERGRADUATE STUDIES  
NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: CHEMISTRY

Abbreviation Code: CHEM Course Number: 150 Credit Hours: 3 Vector: (3-1-0)

Title of Course: Organic Chemistry I

Calendar Description of Course:

General physical and chemical properties of simple aliphatic compounds including hydrocarbons, alkyl halides, alcohols, ethers, carboxylic acids, aldehydes and ketones. Consideration of free radical and ionic mechanisms

Nature of Course:

Prerequisites (or special instructions)

CHEM 102, CHEM 155 should be taken concurrently

Students may not count both CHEM 150 and CHEM 251 for credit

What course (courses), if any, is being dropped from the calendar if this course is approved? CHEM 251-3

2. Scheduling

How frequently will the course be offered? Once per semester

Semester in which the course will first be offered: 90-3

Which of the present faculty would be available to make the proposed offering possible? K. Slessor, E. Kiehlmann, A. Unrau, M. Pinto

3. Objectives of the Course

This course provides a basis for the development of organic chemistry for students majoring in Chemistry, Biochemistry, Biological Sciences, Kinesiology and also for those preparing for various professional programs. It replaces CHEM 251 in these programs and differs very little from CHEM 251 in scope and level but requires only CHEM 102 as prerequisite whereas the present CHEM 251 requires CHEM 102 (or 104) and CHEM 103 (or 105).

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:

July 24/1989  
[Signature]  
Department Chairman

CHU Jones  
Oct. 17 1989  
Dean

11/1/87  
[Signature]  
Chairman, SCUS

SENATE COMMITTEE ON UNDERGRADUATE STUDIES  
NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: CHEMISTRY

Abbreviation Code: CHEM Course Number: 155 Credit Hours: 2 Vector: (0-0-4)

Title of Course: Organic Chemistry Laboratory I

Calendar Description of Course:

Laboratory preparation and characterization of simple organic compounds

Nature of Course:

Prerequisites (or special instructions)

Prerequisite - CHEM 115

Corequisite - CHEM 150 must precede or be taken concurrently

Students may not take both CHEM 155 and CHEM 256 for credit

What course (courses), if any, is being dropped from the calendar if this course is approved? CHEM 256-2

2. Scheduling

How frequently will the course be offered? Once per semester

Semester in which the course will first be offered: 90-3

Which of the present faculty would be available to make the proposed offering possible? S. Black, K. Slessor, E. Kiehlmann, A. Unrau, M. Pinto

3. Objectives of the Course

This course begins the development of laboratory techniques in organic chemistry and serves to support the concepts introduced in CHEM 150. It differs very little from CHEM 256 and might be regarded as a change of number to indicate a transfer of the course from the second to the first year.

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:

July 24, 1989  
[Signature]  
Department Chairman

CHW. Jones  
Oct. 17 1989  
Dean

11/1/89  
[Signature]  
Chairman, SCUS

SENATE COMMITTEE ON UNDERGRADUATE STUDIES  
NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: CHEMISTRY

Abbreviation Code: CHEM Course Number: 250 Credit Hours: 3 Vector: (3-1-0)

Title of Course: Organic Chemistry II

Calendar Description of Course:

Discussion of aromatic compounds, polyfunctional compounds and complex organic reactions; simple spectroscopy

Nature of Course:

Prerequisites (or special instructions)

CHEM 150, CHEM 255 should be taken concurrently

Students may not count both CHEM 250 and CHEM 252 for credit

What course (courses), if any, is being dropped from the calendar if this course is approved? CHEM 252-3

2. Scheduling

How frequently will the course be offered? Once per semester

Semester in which the course will first be offered: 91-1

Which of the present faculty would be available to make the proposed offering possible? K. Slessor, E. Kiehlmann, A. Unrau, M. Pinto

3. Objectives of the Course

This continues the development of organic chemistry for students majoring in Chemistry and Biochemistry and serves as a useful option for students majoring in the Biological Sciences, Kinesiology and also for those preparing for various professional programs.

It replaces CHEM 252 and differs very little from CHEM 252 in scope and level

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:

July 24 1989  
[Signature]

Department Chairman

CHW. Jones

Oct. 17 1989

Dean

11/1/89

[Signature]

Chairman, SCUS

SENATE COMMITTEE ON UNDERGRADUATE STUDIES  
NEW COURSE PROPOSAL FORM

1. Calendar Information

Department: CHEMISTRY

Abbreviation Code: CHEM Course Number: 255 Credit Hours: 2 Vector: (0-0-4)

Title of Course: Organic Chemistry Laboratory II

Calendar Description of Course:

The use of modern laboratory techniques in organic chemistry,

Nature of Course:

Prerequisites (or special instructions)

Prerequisite - CHEM 155

Corequisite - CHEM 250 must precede or be taken concurrently

Students may not take both CHEM 255 and CHEM 356 for credit

What course (courses), if any, is being dropped from the calendar if this course is approved? CHEM 356-2

2. Scheduling

How frequently will the course be offered? Once per semester

Semester in which the course will first be offered: 91-1

Which of the present faculty would be available to make the proposed offering possible? S. Black, K. Slessor, E. Kiehlmann, A. Unrau, M. Pinto

3. Objectives of the Course

This course continues the development of laboratory techniques in organic chemistry and serves to support the concepts introduced in CHEM 250. It is similar to CHEM 356 in scope and level but the change in number is intended to emphasize that the course should be taken at the second year with CHEM 252.

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:

July 24/1989

Department Chairman

CHW. Jones

Oct. 17 1985

Dean

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R. S. ...

Chairman, SCUS