New Course Proposal

1. Catalog Description

a) Course number: CHM 5002

b) Title: Introduction to Graduate Chemical Research

c) Meeting times and credit: (1 -0- 1; Credit/No Credit)

d. Term(s) to be offered (F)

e. Short title: Grad Chm Res

f. Course description: This course will provide instruction in the areas of laboratory safety, chemical literature, and ethics in science.

g) Prerequisites: Admission to the graduate program in chemistry.

h) Initial term of course offering: Fall 2003

2. Objectives and Evaluation of the Course

a) List the objectives of the course: 1) To teach students how to establish and maintain a safe environment in the laboratory, including working with hazardous materials, becoming familiar with emergency procedures, and learning how to dispose of hazardous materials. 2) To teach students how to search the chemical literature, electronically and otherwise. 3) To teach students ethical obligations with regard to reporting of scientific data, what constitutes scientific fraud, and the responsibility of scientists to society. This is not a general education course.

b) Indicate how students’ achievement of the stated objectives will be assessed and grades will be earned, based on activities such as projects, reports, research papers, oral presentations, group problem solving, examinations, etc. 1) The safety section of the course will conclude with teams of students visiting and evaluating each research laboratory. From these visits a formal report listing all violations will be submitted. Copies will also be given to research directors whose labs have been inspected. There is also a safety test at the end of the course. Each graduate student will eventually do experimental research. In the course of this research, the research director will have further opportunity to reinforce safety instruction received in the course. 2) The success of the chemical literature section will be determined by the student's ability to carry out a thorough electronic literature search on a particular topic. 3) The ethics instruction will be assessed through formal assignments that take the form of ethics situations posed by the instructor and written answers by the students. In addition, the Graduate Student exit survey will ask each student to assess whether this course provided adequate safety training and skills for searching the chemical literature.

c) For technology-delivered and other non-traditional-delivered courses… This is a traditional course.

d) If this course is numbered 4750 ... : This is a 5000 level course.

e) If applicable, indicate whether this course is writing active, writing-intensive, or writing-centered: Not applicable.

3. Outline of the Course
a) Specify units of time: (1-0-1) One 50 minute class period for each of 15 weeks.

Week 1 - Introduction
Week 2 - Safety (Personal protection)
Week 3 - Safety (Personal protection)
Week 4 - Safety [Material Safety Data Sheets (MSDS)]
Week 5 - Safety (Hazardous waste)
Week 6 - Chemical Information (Chemistry and the Internet)
Week 7 - Chemical Information (Electronic searching of Chemical Abstracts)
Week 8 - Chemical Information (Library visit and structure searching)
Week 9 - Chemical Information (Library technology room; structure searching)
Week 10 - Introduction to American Chemical Society Style Guide for scientific writing.
Week 11 - Scientific presentations
Week 12 - Scientific ethics
Week 13 - Scientific ethics
Week 14 - Scientific ethics
Week 15 - Final exam

b) For technology-delivered or other nontraditional-delivered courses… Not applicable.

4. Rationale

a) Purpose and need: Many of our graduate students arrive without having previously received any formal instruction in areas of safety, chemical literature, and ethics in science. Safety requirements have increased over the years and compliance with EPA and OSHA regulations is of utmost importance. An introduction to the chemical literature by an expert in a classroom setting will be much more efficient than each student being taught separately by his research director. The huge impact that science has on society makes a formal introduction to ethical issues highly desirable.

b) Justification of the level of the course and prerequisites: Students who take this course will have an undergraduate degree and a strong undergraduate background in chemistry. The complexity of assignments will take advantage of their advanced knowledge of chemistry thus justifying a 5000 level course number.

c) Similarity to existing courses and/or effect upon programs in other departments: The course will be unlike any courses taught in other departments. The course will be taught simultaneously with the undergraduate course, CHM 3500. The graduate students, however, will require a deeper understanding of material disposal techniques and will be assigned literature searches and scientific ethics assignments that require greater sophistication.

d) Impact on Program: The course will be required of all incoming graduate students in chemistry.

5. Implementation

a) Faculty members to whom the course may be assigned: Dr. Doug Klarup; Dr. Mark McGuire.

b) Additional costs to students: None


6. Community College Transfer: Not applicable
7. Date approved by the department or school: 2-3-03

8. Date approved by the college curriculum committee: 2-21-03

9. Date approved by CGS: 4/1/03