GENERAL EDUCATION COURSE PROPOSAL
ORAL COMMUNICATION INTENSIVE FORM

Department or program_____Chemistry_____

Semester Course Number ___5861 __

Course Title ____Polymer Science 1: Polymer Chemistry and Plastics___
_____

Faculty teaching course _____Allen Hunter_____
_____
_____

Estimated number of sections to be offered in Fall 2002 __1__, Spring 2003 __0__

Please note that general education course proposals (send 14 copies) must include this page, the pages on Criteria Response and Narrative, and a syllabus.

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Submitted by (Daryl Mincey', Chemistry Department Chair) (date)

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Reviewed by (Ikram Khawaja's, Acting Dean Arts & Sciences) (date)

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Certified by (Bill Jenkins, GEC Coordinator) (date)

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(Chair, Academic Senate, signature) (date)

GEC Proposal Number (GEC Use Only) _____

QUESTIONS

1) Is the course designed for majors or for the general student population?

This course is taken primarily by Chemistry Majors and also by a few Engineering Students and will be one of the senior level Chemistry courses designed to help our majors complete the Oral Communication Intensive requirements. This course typically enrolls 4-8 students and has never enrolled more than 10 in the last 9 years (including its Quarter analogues, Chemistry 824/825).

More details about the Fall 2001 session of this class which was carried out in the proposed format for both writing and oral communication intensive activities, including the specific projects, can be found at http://www.as.ysu.edu/~adhunter/Teaching/Chem5861/index.html.

2) What percentage of the course grade will be based on oral communication assignments (minimum of 30%)?

Oral communication assignments (PowerPoint presentations followed by question and answer sessions) comprise 175/500 (35%) points for the course. There are also numerous less formal oral presentations in the lab as well as question and answer sessions in the lecture that contribute to the 50 points for the "Lab Technique and Effort" grade.

3) Approximately how many minutes will students speak (minimum of two major assignments)?

Approximately 10 hours of class time and 5 hours of lab time are set aside for the Oral presentations. Each student will give 3 individual and will participate in 3 group presentations. Class size has never been more than 10 students. Therefore, each student will make presentations for a total of at least 1.5 hours (in 6 formal oral reports - half individual and half team reports) and will be involved with responding to and critiquing the other students for 13.5 hours.

In fact, the time consuming nature of using this intensive oral presentation structure was a primary reason for increasing the "lecture" hours for this course from 2 SH for 2001/2002 to 3SH for 2002/2003 (plus a 1SH lab in each case that meets 3 hours a week). Also, see below in question 4's answer.

4) Approximately how many minutes will be devoted to each oral communication activity (i.e., oral reports, persuasive presentations, group discussions, and other oral communication activities)?

The students' individual oral reports or components of larger group oral reports (i.e., where each student presents their specialist part of the project and take turns with the general introduction and conclusion sections) will typically each be ten minutes in length for the 6 presentations. The presentations are spread over the semester (one about every three weeks with two in the final two week) and in each case are followed by a formal 5 minute question and answer session where the students and instructor ask questions about the presentations and the chemical content.

While these times will be the average for the 6 presentations, it is expected that

the initially presentations will typically be somewhat shorter than this (to allow more time for questions) and the later ones somewhat longer. In particular, the final oral presentation on the lab project will be scheduled for 2 hours during the lab time. Given the nature of labs, considerable time is spent during each 3 hour labs on less formal oral interactions including informal "chalk talks" at the blackboards where the students discuss ideas for their project and their results.

5) What will be the balance between oral communication as a learning process and oral communication activities designed to teach oral communication skills?

About 1/3 of the time and grades devoted to oral communication will emphasize how to prepare and deliver an appropriate oral presentation as a chemist (i.e., presentation style and execution). This will involve both formal instruction before the presentations are made, formal and informal comments by the class in the Q & A session after the talks, and individual feedback from the instructor during office hours and "slow spots" in the lab. Although this can not be clearly distinguished from content, about 2/3 of the grade from each assignment will reflect student understanding of the content they are presenting and their making a persuasive case (i.e., organized and focused) to get their point(s) across.

During the Fall 2001 session of this class, the initial oral reports were very uneven in execution and overall quite weak but by the end of the class the oral presentations were of a uniformly high standard. The students learned some of their presentation skills from the instructor but more from each other via "lateral - peer learning." They had a strong but friendly competition and when one did something particularly well in one talk the others would all integrate it into their next talk.

6) How will the course integrate oral communication as a vital component?

Oral communication will represent about 1/3 of the grade and thus a major part of the way students demonstrate their mastery of the materials covered. To give a good presentation they need both "generic" presentation skills and also to research their topics carefully and then think about and organize their presentations. This will take place simultaneously with their preparing the written reports (which are handed in the same days) and our experience has shown that such integration of oral and written reports with the research the topics require results in both better long term learning and general skill transportable to other oral/written projects.

7) How will the oral communication process (the sequential activities of planning, communicating, and self-evaluation) be taught?

There will be an initial introduction to the general principles followed by: peer feedback on preparing the talks (the students work together on this aspect) before the presentations and then after the talks as well as faculty feedback "one on one" afterwards. Because each student gives 6 presentations, they learn over the term how to improve each presentation with the last being much better than the first.

8) How will the course integrate General Education Goal #1 (speaking in particular)?

The central feature of this course involves having the students learn content

knowledge about polymer chemistry with written and spoken assignments being primary tools to both help them do so and to asses their progress.

9) How will the course integrate General Education Goal #2 (research)?

For each project, the students will carry out extensive research on some project in the area of Polymer Chemistry. This research will involve reading the current professional literature, review articles and books. They will also carry out lab research.

10) How will the course integrate General Education Goal #3 (critical thinking)?

The students will have to evaluate each piece of new information they get from the literature and/or their lab work to see how it integrates with what they already know and to synthesize a cohesive picture. This is the core of critical thinking in science!

11) How will students' progress in achieving goals #1, #2, and #3 be assessed?

Oral and written feedback from classmates and the instructor will be compiled and the students progress at making professional presentations and written reports will be evaluated with respect to the standards defined by the department for the final presentations of Chemistry majors in their Capstone chemistry oral and written presentations (Chemistry 4850 and 4850L) and with respect to professional presentations at American Chemical Society meetings and in American Chemical Society journals.

12) How will the course prepare students to pursue critical inquiry within a field, do research within a field, and address an audience within a field?

This is the central theme of this course, each assignment involving either literature research and/or lab research on a topic in his/her discipline and integrate them into a cohesive whole.

13) How will students' progress in learning to speak cogently and confidently within a field be assessed?

Self feedback reports, oral feedback from his/her classmates, oral and written feedback from the instructor.

14) Do faculty teaching the course have some experience in teaching oral communication assignments or have they taken an Oral Communication workshop?

Professor Hunter has integrated such oral communication assignments into all of her/his upper level classes for 8 years and into many of her/his lower level classes as well. In 2001/2002 oral communication totaled 1/3 of the course's grade and used 1/4 to 1/3 of the class's time. Hunter has made well over 60 professional presentations to universities and national or international conferences in her/his discipline.

Chemistry 5861 *Polymer Science 1: Polymer Chemistry and Plastics.* [1]

Current Catalogue Description

*5861 *Polymer Science 1: Polymer Chemistry and Plastics.* Preparation, characterization, structure-property relationships, morphology, and uses of the major commercial polymers. Two hours lecture and three hours laboratory. Prereq. or Concurrent: CHEM 3720 and CHEM 3739 or 3737 or consent of the department chair. 3 s.h.

Proposal for Revised Catalogue Description

*5861 *Polymer Science 1: Polymer Chemistry and Plastics.* Theoretical and practical aspects of the preparation, characterization, structure-property relationships, morphology, and uses of both the major commercial and newer polymers. Three hours lecture and three hours laboratory. This course is designated as both oral communication intensive and writing intensive. Prereq. or Concurrent: CHEM 3720 and CHEM 3739 or 3737 or consent of the department chair. 4 s.h.

Note 1: The suggested changes in the first sentence do not change the emphasis of the course or its actual lecture content but do better reflect what is actually taught.

Note 2: I am asking for the increase from 3 SH to 4 SH to allow for the increase from 2 to 3 hours of "lecture" per week.

Note 3: In the paragraph at the start of the Chemistry Department's listings in the course catalogue are noted which courses carry which general education credit. I would also think that it would be better to list it by each course (it is so listed on the web page at http://www.cc.ysu.edu/ger/GERlist.html) but this appears not to be General Education/University policy (presumably to save paper).

[1] This request for changed course description and Credit Hours is Currently Before the Graduate Curriculum Committee (Sept 17th, 2002)

Chemistry 5861: Polymer Science I - Polymer Chemistry
Syllabus for Fall 2003

Professor: Dr. Allen D. Hunter (Room 5015, Ward Beecher Hall), 742-7176, adhunter@cc.ysu.edu

Textbook: "Polymer Chemistry" by Malcolm P. Stevens, 3rd Edition (2nd Edition OK).

Lecture: Monday, Wednesday, and Friday: 12:00 to 12:50, WB 2008.

Lab: Tuesday: 8:00 to 10:50, WB 6035.

Office Hours: Monday, Wednesday, and Friday 11:00 to 12:00 and Tuesday & Thursday 17:05 to 17:35 and 18:25 to 18:55, or by appointment (I'll be in my office, WB 501, or the Advanced Synthesis or X-Ray labs). If you find me in a meeting, please interrupt! These Friday lectures are contingent on the Oral Communication and Writing Intensive components being approved.

Intensive Components: This course is designed to help meet your upper level requirements for both an Oral Communication Intensive and a Writing Intensive component of the General Education Model (http://www.cc.ysu.edu/ger/). As such, both oral communication and writing assignments are fully integrated into the course to develop your writing and oral communication skill in a fashion appropriate to a professional Chemist (or someone in an allied discipline). As such, you will each carry out 5 projects (some individually and some as teams) that will require you to prepare a written report and give a PowerPoint presentation followed by a question period for the class. The class as a "team of the whole" will also prepare a more extensive report describing the results of their lab work in the format of a full paper in the American Chemical Society Journal "Macromolecules" and do a joint PowerPoint presentation on its results. The final exam will be a open book take home exam in which the student will write short 3 page miniature essays on 3 questions chosen out of 5.

Web Page: http://www.as.ysu.edu/~adhunter/Teaching/Chem5861/index.html

Course Description: *5861 *Polymer Science 1: Polymer Chemistry and Plastics.* Theoretical and practical aspects of the preparation, characterization, structure-property relationships, morphology, and uses of both the major commercial and newer polymers. Three hours lecture and three hours laboratory. This course is designated as both oral communication intensive and writing intensive. Prereq. or Concurrent: CHEM 3720 and CHEM 3739 or 3737 or consent of the department chair. 4 s.h.

Lecture(s)	Chapter(s)	Title
1 - 5	1	Introduction to Chemistry 5861 and Basic Principles of Polymer Chemistry
6 - 112	2	Molecular Weight and Polymer Solutions
13 - 19	3	Chemical Structures and Polymer Morphology
20 - 25	4	Chemical Structure and Polymer Properties
26 -35	5	Polymer Characterization
36 - 45	6 - 17	Individual Polymers and Special Topics

* This schedule is tentative and the order and relative weighting of topics may be revised as the class progresses.

GRADING SYSTEM	**TOTAL POINTS**
Project Report I (25 points for Written and 25 for Oral presentation)	50
Project Report II (25 points for Written and 25 for Oral presentation)	50
Project Report III (25 points for Written and 25 for Oral presentation)	50
Project Report IV (25 points for Written and 25 for Oral presentation)	50
Project Report V (25 points for Written and 25 for Oral presentation)	50
Lab Report (50 for Lab Technique and Effort, 50 for Written, and 50 for Oral presentation)	150
Take Home (Essay Type) Final Exam	100
Total (250 points for Written, 150 points for Oral, 50 Points for Lab Technique & Effort), A 90 - 100%, B 78 - 89%, C 65 - 77%, D 50 - 64%, F Below 50%	500

Reports: To train you to make effective oral and written reports in a style appropriate for a professional chemist, in the first few weeks you will be given training in how to design and execute a professional oral and written report using Microsoft PowerPoint and Word, respectively. The content and topics for these reports will be announced as the class progresses from current topical areas of polymer chemistry and the expected format of the final lab paper can be found at: http://www.as.ysu.edu/~adhunter/Teaching/Chem5861/Chem5861.MacromoleculesPaperFormat.doc.

Exam: The final exam is comprehensive and will be open book and take home. You will have to answer 3 out of 5 questions poised on the exam and answer each with a concise essay including diagrams as appropriate.

Lab: The lab is integral to the course and will follow the collaborative discovery research model.

Attendance: Lecture attendance is mandatory and students are responsible for all information, material, and announcements made in class. Typically, the oral reports will be presented on Mondays except for the final oral lab report which will be presented in the final lab class on Tuesday.

Assigned Problems: I will assign problems from the text and on handouts regularly. These will not be graded but are very important since these are the questions on which most of the exams will be based!

Academic Honesty: In accordance with university policy and professional standards, the highest levels of academic integrity are expected in this lecture and lab. The code of student conduct will be strictly enforced. Academic dishonesty will result in reductions in grades and/or expulsion from this class and/or the university.

Chemistry 5861L, Polymer Chemistry I Laboratory, Fall 2002
Laboratory Research Project, Structure Property Relationship Study

Outline of Research Project Concept: This research project is designed as a rigorous polymer research project, but is at a scale appropriate for our course. It will be carried out on a group basis. Thus, the group will decide on the target polymer system, how the research problem will be addressed, and the roles of each of the project participants. Each of you are seniors or graduate students and will in a very short time be working in higher level academic research labs, in industry, or in other professional settings. This project concept was chosen to help you build your individual research skills and rounded expertise in polymer science and to build your team work and project presentation skills while allowing each student to emphasize their own areas of interest.

Project Topic: The overall project must be a structure-property relationship study focusing on one class of structurally related polymer. Various routes to the "parent" polymer of this series should be employed and one of these methods should be used to prepare a series of different derivatives of this parent polymer in which one structural characteristic is systematically varied. The complete range of polymer characterization tools available at YSU (and perhaps at neighboring institutions and at participating/collaborating companies) should be employed.

Project Definition:[1,2] Using this assignment document as a starting point, the group should meet to design the overall project scope and goals and their individual roles, determine what literature review needs to be done and carry it out, design the specific experimental procedures, determine what materials need to be ordered or obtained within YSU, determine all safety issues in advance and obtain the requisite training, MSDS sheets, etc.,

Project Reporting:[3] As with any professional project, each stage along the way as well as the final project materials needs to be fully documented. Keep minutes of each of your team meetings to document all main decisions made and the major points of controversy and the basis on which they were decided. Further, keep detailed records of all materials that had to be ordered or obtained within YSU (for a final project budget and the supplies and materials report), all raw data collected (whether in your lab books or spectra, etc.), all contacts with non-YSU collaborators (if any), copies of all references used, etc. This will not only facilitate your writing of the final project report but is also good professional practice.

The Interim Project Materials: At the end of each week, the team will meet to discuss that week's progress and define the next weeks goals and activities. On the first day of each week, the project team will meet to present a short progress report to the Chemistry 5861 Polymer Science Director (Hunter) that will include what was accomplished the previous week, the goals and activities planned for the coming week, and to discuss opportunities and challenges. This weekly oral report should include a 5-15 minute "chalk talk" and draft copies of the interim project documents. At least 3 drafts of the final project report should be handed in to the instructor in the 9th, 11th, and 13th weeks and a report outline is required by the 7th week.

The Final Project Materials: The final project materials will have several components. One will be a paper written in the format of *Macromolecules* as described in the separate handout. The group will also present a 45 minute PowerPoint report summarizing their results. Both of these will be emailed to adhunter@cc.ysu.edu. All materials prepared must be handed in well labeled sample vials and all raw characterization data needs to be included in the package that is handed in.

The State of the Laboratory: While this research project is in progress and especially when you are done, ensure the laboratory and instrumentation spaces are in immaculate condition!

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[1] With careful project design and careful choice of the literature assignments, there can be a high degree of synergy between the Literature Projects and the Laboratory Project - keep this in mind as you design each of these Chemistry 5861 components.

[2] If an appropriate research topic is chosen, it might eventually lead to a publication after several classes work and/or a formal student project….

[3] As the project progresses, keep a record of specific changes in this project description that you would recommend for future years as an annotated copy of this printed document.