

# POLYMER CHARACTERIZATION

## Syllabus for Spring Semester 2002 EMA 6461 (3 credits); Section 5112

**Course Objectives:** This course will provide an overview of the common techniques for determining the structure and characteristics of polymeric materials. The goals of the course are as follows: 1) to equip the student with the knowledge necessary for deciding which characterization technique(s) would be appropriate for determining properties of interest; 2) to impart the student with sufficient background to enable the proper judgment of the quality of data obtained, and the significant variables effecting the results; 3) to enable the student to comprehend the polymer literature and make their own judgment regarding the interpretation of data; 4) to assist the student in passing the MSE Specialty portion of the qualifying exam ;-). This course will not delve into techniques of general materials characterization except where the method differs when applied to polymers. Instead, the methods studied will typically be aimed at determining the polymer's size and molecular weight/distribution, primary structure of the backbone, nature of the chemical bonding environments, crystallinity, thermo/mechanical behavior, secondary conformations, tertiary morphology, surface or interfacial characteristics, etc..

**Time:** M,W,F: 3<sup>rd</sup> period (9:35am to 10:25am)

**Place:** MCC-A 2196

**Instructor:** Laurie B. Gower, Assistant Professor  
Dept. of Materials Science & Engineering  
210A Rhines Hall  
Office: 846-3336 Home: 376-6190  
E-mail: [lgowe@mse.ufl.edu](mailto:lgowe@mse.ufl.edu)

**TA:** ?  
Dept. of MSE

**Office Hours:** M,W: 4<sup>th</sup> period (10:45pm), or by appointment

**Textbook:** Polymer Characterization- Physical Techniques; 2<sup>nd</sup> Edition, by D. Campbell, R.A. Pethrick, J.R. White, Stanley Thornes Publishers (2000). ISBN: 0-748740058

**Homework:** Reading assignments and selected problems, approximately weekly.  
Supplemental reading, homework and grades will be posted on the class WEB page at:  
[http://mse.ufl.edu/~lgower/EMA\\_6461/EMA6461.htm](http://mse.ufl.edu/~lgower/EMA_6461/EMA6461.htm)

**Grading:**

|              |     |                             |
|--------------|-----|-----------------------------|
| Homework-    | 15% | (with lowest grade dropped) |
| First exam-  | 20% |                             |
| Second exam- | 20% |                             |
| Third exam-  | 20% |                             |
| Lab project- | 25% |                             |

- Exams will be held during the evenings to provide sufficient time.
- Requests for adjustment to any grade should occur during the 1 week period following the posted grade in question, and must be approved by course instructor (the TA can not change grades!).
- Homework should be turned in at the beginning of class (or via email). NO EXCEPTIONS!
- Policy on Class Attendance: Attendance will not be formally monitored, but classroom contribution to discussions will be noted and taken into consideration for borderline grades. Therefore, you may want to notify me of any necessary absences.

- Policy on Make-up Exams: The instructor should be notified in advance of any conflicts in exam times. For unfortunate cases of sudden illness or death of a family member, please try to contact me or leave a message before the exam.
- Policy on Special Accommodations: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

University of Florida Honor Code- All students are expected to abide by the University of Florida Honor Code, which states: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. It is expected that students obey rules governing the use of copyrighted materials. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."* Further information academic honesty is available at [http://www.dso.ufl.edu/Academic\\_Honesty.html](http://www.dso.ufl.edu/Academic_Honesty.html)

**Lab Project:** In an effort to develop a lab for this course, the students will each contribute (in teams of three or less) by developing a polymer characterization laboratory exercise. To avoid overlap, the topics will be chosen on a first come, first serve basis. The experiment must be tested for feasibility of employing it within a reasonable time frame (one or two lab periods) and with available or inexpensive equipment. The report should be written in the format of how it will be provided to a future class, with the addition of a conclusion section at the end discussing if the original idea worked and the feasibility of the project with any recommended changes. Note- The grade will take into consideration creativity of design (such as method(s) for making the exercise interesting), as well as informative.

Grading- 25% for each of the following components:

- I. Oral Presentation- judged by content, clarity, enthusiasm (possibly via peer judging)
- II. Written Report- judged on content, clarity, professionalism\*
- III. Creativity – judged by interesting method of lab design, or interesting method of presentation
- IV. Self-evaluation – form is privately filled out by each team member for self and other team members

Important Project Deadlines: (earlier dates are recommended)

- Topic description (brief abstract): First come, first serve basis until → January 23<sup>rd</sup>
- Outline of Report February 8<sup>th</sup>
  - indicate topics covered in background overview (e.g subheadings)
  - include detailed description of experimental section
  - provide a list of any hazards associated with chemicals
- Chemicals/equipment order given to TA (upon Instructor approval) February 15<sup>th</sup>
- Short synopsis of 1<sup>st</sup> experimental trial March 29<sup>th</sup>
- Class Presentation April 15, 17, 19<sup>th</sup>
- Final Report April 26<sup>th</sup>

\* Some useful Web pages: [http://www.crlt.umich.edu/lab\\_guidebook.html](http://www.crlt.umich.edu/lab_guidebook.html),

<http://www.isat.jmu.edu/common/projects/StyleManual/ExampleReport/ExampleLabReport.htm>