Instructor Information

Instructor: Gerard Caneba, PhD, Professor
Office Location: 304B Chemical Sciences and Engineering Bldg
Telephone: Office – (906) 487-2051 (Emergencies only)
E-mail: caneba@mtu.edu (Best way to contact)
Office Hours: To be announced, or by appointment

Course Identification

Course Number: CM/CH 4631
Course Name: Polymer Science and Engineering Laboratory
Course Location: S001, S008 Chemical Sciences and Engineering Bldg
Class Times: 10:05 – 10:55 AM, 3-5 PM Tuesdays
Prerequisites: CH 1122 or (CH 1160 and CH 1161), CMCH 4610 (co-requisite)

Course Description/Overview

Laboratory component to the introductory study of the properties of polymers. Includes structure and characterization of polymers in the solid state, in solution, and as melts. Topics include viscous properties, rubbery elasticity, polymer formation, (macro)molecular analysis and polymer processing.

Course Learning Objectives

- To obtain laboratory experience in various aspects of polymeric materials.
- To be able to do some basic calculations involving experiments pertaining to their thermodynamic, molecular, fluid-dynamic, mechanical, thermal, and reaction-kinetic properties.

Course Resources

Course Website(s)
- Canvas<http://mtu.instructure.com>
Required Course Text

Course Fees
Contact Registrar’s or Cashier’s offices

Course Documents
To be handed out, emailed, or made available in Course Website

Grading Scheme

Please see University standard grade system from CANVAS.

Grading Policy
Grades will be based on the following:

<table>
<thead>
<tr>
<th>Experiments (6 x 150 Pts each)</th>
<th>900</th>
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<tbody>
<tr>
<td>Special Project</td>
<td>100</td>
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<tr>
<td><strong>Total Points</strong></td>
<td><strong>1000</strong></td>
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Missed Experiments
You are not allowed to miss an experiment, unless warranted (serious illness, emergency). In case of missed experiment based on legitimate reason(s), a make-up experimental effort will be assigned and done before the end of the semester. Only one experiment can be made up. Missing a total of two experiments will result in an incomplete grade or a grade of “X”, which can be completed only after the semester ends.

Course Policies
Students will form groups of 2-3 people. Each group must use a lab notebook that will be provided. Other items that will be provided (if not yet available to student) but returned at the end of the semester are: labcoats, safety glasses. Chemical, thermal gloves will be provided whenever needed.

Each group is obligated to do 6 of the experiments only. Experiments will be introduced at least a week before they will be conducted. Completed or partial Job safety assessment forms (JSAs) will be given to familiarize students with safety aspects. The official labroom for the course is S001 of the Chemical Sciences and Engineering building. However, other labrooms may be used, such as S008.

During the week of an experiment in the 1-2 PM time period, students will be given a short quiz to make sure they have sufficient familiarity with the experiment.
At the end of the experiment, a photocopy of items entered in the lab notebook will be submitted to the instructor. This will be true whenever a new entry is made. Lab reports will be submitted at least within the day of the next experiment. Reports will be graded as those belonging to the lab group, i.e., the grade of the group is the same as that of the individual student in the group. Each lab experiment is worth 15% of a student’s grade.

For the remaining 10% of the grade for the course, the student can do a special project to improve or establish experiments for the course. This special project can be in the form of experimental or computer work that will be assigned by instructor.

**Other Expectations for the Course:**

1. Students will come on time for class, and will not leave until dismissed or in an emergency situation
2. Instructor will come on time unless he is out of town or in an emergency situation. In case of absence, instructor will hold a make-up class.
3. Instructor will maintain regular office hours for consultations
4. Students will not make unnecessary noise during the class/experiment period, and are expected to participate in class/experiment discussions.

**Collaboration/Plagiarism Rules**

Cheating in any form will not be tolerated. Those who cheat on examinations will be reported to the Dean of students for disciplinary action.

**University Policies**

Academic regulations and procedures are governed by University policy. Academic dishonesty cases will be handled in accordance the University's policies.

If you have a disability that could affect your performance in this class or that requires an accommodation under the Americans with Disabilities Act, please see me as soon as possible so that we can make appropriate arrangements. The Affirmative Action Office has asked that you be made aware of the following:

*Michigan Technological University complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990. If you have a disability and need a reasonable accommodation for equal access to education or services at Michigan Tech, please call the Dean of Students Office at 487-2212. For other concerns about discrimination, you may contact your advisor, Chair/Dean of your academic unit, or the Affirmative Programs Office at 487-3310.*

**Academic Integrity:**

[http://www.studentaffairs.mtu.edu/dean/judicial/policies/academic_integrity.html](http://www.studentaffairs.mtu.edu/dean/judicial/policies/academic_integrity.html)

**Affirmative Action:**
List of Possible Laboratory Experiments

1. Liquid-liquid phase equilibria
2. Polymer film/sheet formation
3. Diffusion and sorption of penetrant liquids into polymers and composites
4. Viscometry of polymer solutions and suspensions
5. Rubber swelling
6. Polymer/composite extrusion with Carbon Dioxide Injection
7. Electrospinning of poly(vinyl alcohol)