Introduction to Polymer Science & Engineering
ECH4905 Section 2B30

Class Periods:  MWF Period 10 (5:10 pm - 6:00 pm)
Location:  Black Hall Rm 415 (BLK 0415)
Academic Term:  Fall 2018

Instructor:
Prof. Yeongseon Jang
y.jang@ufl.edu
Office Phone Number: 352.294.1289
Office Hours:  Fridays 1 – 2 pm or by appointment (ChE building, Rm 217)

Teaching Assistants:  There will be no TA in this class. Please use office hours to contact Prof. Jang regarding the course.

Course Description
This course offers an overview of polymer science and engineering including polymer synthesis and characterization. Interrelation of polymer structure, properties and processing, polymerization kinetics, thermodynamics of polymers, characterization and fabrication techniques, and recent applications of functional polymers are covered.

Course Pre-Requisites / Co-Requisites
Physical Chemistry (CHM 4411), Organic Chemistry 1 (CHM 2210)

Course Objectives
1. Learn chemical structure and formulas of common polymeric materials
2. Characterize molecular weight (MW) and MW distribution in terms of common parameters
3. Distinguish different polymerization reactions and mechanisms
4. Predict conversion kinetics and MW resulting from polymerization reactions
5. Estimate the thermodynamic interaction and miscibility of polymer solutions and blends
6. Identify the physical states and transition temperatures of polymers
7. Describe the methods to characterize properties of polymers
8. Apply this knowledge to critically analyze polymer engineering results in the current literature

Materials and Supply Fees
Course materials, homework assignments, announcement and grades will be posted on Canvas (the E-learning system at the University of Florida). Check it regularly.

Optional Textbooks
Course notes are developed and provided by the instructor, based on the textbooks below:

Recommended Materials
3) Other recommended materials and articles will be suggested during classes.
Course Schedule (the schedule can be adjusted accordingly)

Week 1: Ch. I. A Brief Introduction to Polymer Science
Week 2: Ch. II. Characteristics of Polymers: Structure-Property
Week 3: Ch. II-(2) MW Determination Techniques
Week 4: Ch. III. Synthesis and Reactions of Polymers: Condensation & Addition
Week 5: Ch. III-(1) Step-Growth Polymerization
Week 6: Ch. III-(2) Chain-Growth Polymerization
Week 7: Ch. III-(3) Other Types of Polymerization
Week 8: Mid-Term Exam
Week 9: Ch. IV. Polymer Solution and Blends
Week 10: Ch. V. Fabrication & Processing of Polymers
Week 11: Ch. VI-(1) Recent Development of Polymeric Materials
Week 12: Ch. VI-(2) Functional Polymers
Week 13: Ch. VII-(1) Transitions in Polymers
Week 14: Ch. VII-(2) Polymer Viscoelasticity
Week 15: Ch. VIII. Experimental Techniques to Characterize Polymer Properties
Week 16: Final Exam

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is expected. All students should participate every day. Lecture notes and occasional quizzes will be provided during classes. Excused absences must be consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.

Evaluation of Grades

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<thead>
<tr>
<th>Assignment</th>
<th>Total Points</th>
<th>Percentage of Final Grade</th>
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<tbody>
<tr>
<td>Homework Sets (5)</td>
<td>100 (20 each)</td>
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<tr>
<td>Quizzes (4)</td>
<td>100 (25 each)</td>
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<td>Midterm Exam</td>
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<tr>
<td>Final Exam</td>
<td>100</td>
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<td><strong>Total</strong></td>
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Grading Policy

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<tr>
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<tr>
<td>380 – 429</td>
<td>A-</td>
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<tr>
<td>350 – 379</td>
<td>B+</td>
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<tr>
<td>320 – 349</td>
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<tr>
<td>300 – 319</td>
<td>B-</td>
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<tr>
<td>270 – 299</td>
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<td>240 – 269</td>
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<td>210 – 239</td>
<td>C-</td>
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<td>190 – 209</td>
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<td>170 – 189</td>
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<tr>
<td>0 – 149</td>
<td>E</td>
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More information on UF grading policy may be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx
**Students Requiring Accommodations**
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [https://www.dso.ufl.edu/drc](https://www.dso.ufl.edu/drc)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

**Course Evaluation**
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at [https://evaluations.ufl.edu/evals](https://evaluations.ufl.edu/evals). Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at [https://evaluations.ufl.edu/results/](https://evaluations.ufl.edu/results/).

**University Honesty Policy**
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. 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." The Honor Code ([https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/](https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/)) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

**Software Use**
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

**Student Privacy**
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: [http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html](http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html)
Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: [http://www.counseling.ufl.edu/cwc](http://www.counseling.ufl.edu/cwc), and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or [http://www.police.ufl.edu/](http://www.police.ufl.edu/).

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. [https://lss.at.ufl.edu/help.shtml](https://lss.at.ufl.edu/help.shtml).

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. [https://www.crc.ufl.edu/](https://www.crc.ufl.edu/).

Library Support, [http://cms.uflib.ufl.edu/ask](http://cms.uflib.ufl.edu/ask). Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. [https://teachingcenter.ufl.edu/](https://teachingcenter.ufl.edu/).

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. [https://writing.ufl.edu/writing-studio/](https://writing.ufl.edu/writing-studio/).

Student Complaints Campus: [https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf)