Advanced Chemical and Biological Processing Laboratories
ECH 6937L  Section 17GB, 2147

Class Periods: W, Period 8 - 10; F, Period 7 - 9
Location: CHE 220 and 300A
Academic Term: Spring 2017

Instructors (Please contact through email for appointments)

Yiider Tseng (Coordinator; Module 4 - 6)  Oscar Crisalle (Modules 11 - 12)
Email Address: ytseng@ufl.edu  Email Address: crisalle@che.ufl.edu
Office Phone Number: (352)392-0862  Office Phone Number: (352)392-5120
Office Location: CHE 223  Office Location: CHE 429

Jason Butler (Modules 9 - 10)  Dmitry Kopelevich (Modules 13 - 14)
Email Address: butler@che.ufl.edu  Email Address: dkopelevich@che.ufl.edu
Office Phone Number: (352)392-2591  Office Phone Number: (352)392-4422
Office Location: CHE 431  Office Location: CHE 315

Anuj Chauhan (Modules 7 - 8)  Soohwan Jang (Module 15)
Email Address: chauhan@che.ufl.edu  Email Address: jangmoun@ufl.edu
Office Phone Number: (352)392-2592  Office Phone Number: (352)392-3412
Office Location: ChESC 261  Office Location: CHE 319A

Module Assistants
The Module Assistants and their contact information are listed in the Canvas website; please contact them through the website.

Course Description
This is a 3-credit lab course offering to graduate students who want to have a basic training in polymer, chemical and bio-based processing techniques. The course aims to expand the students’ ability in hands-on experiments, report writing, and oral presentation. Upon accomplishing the course, students are expected to have basic technical skills and understanding of physicochemical processes.

Experimental Modules

Laboratory Orientation and Training (Butler and Crisalle)
Module 1: Lab safety, orientation, and ethics (Butler & Crisalle)
Module 2: Lab report writing and error analysis (Butler)
Module 3: Oral communication skills (Crisalle)

Biochemical Kinetics and Diffusion (Tseng)
Module 4: Michaelis–Menten kinetics
Module 5: Separation of DNA under electrophoresis
Module 6: Polymerase chain reaction

Drug Transport through Contact Lens (Chauhan)
Module 7: Hydrogel preparation and ion permeability
Module 8: Measuring drug transport and modeling

Fluid Dynamics of Particulate Systems (Butler)
Module 9: Spin-coating
Module 10: Fluidized beds: Minimum velocity of fluidization
Advanced Chemical Engineering Systems (Crisalle and Kopelevich)

Module 11: Fixed bed based ammonium gas absorption (Crisalle)
Module 12: Cooling tower (Crisalle)
Module 13: Distillation Column (Kopelevich)
Module 14: Thermodynamics of micellar systems (Kopelevich)
Module 15: Hydrogen Fuel Cell (Jang)

Poster Presentation (Tseng)

Module 16: Presentation

Course Pre-Requisites / Co-Requisites
None.

Course Objectives
• Students will gain hands-on experience by learning proper and basic chemical process experiments and cultivate problem-solving abilities to solve realistic engineering problems.
• Students will be able to analyze experimental data from available resources and techniques, such as technical manuals, databases, handbooks, literature, and statistical methods.
• Students will be able to rationalize units, make order of magnitude estimates, interpret graphic data, assess reasonableness of solutions, and select appropriate levels of solution sophistication.
• Students will exhibit critical and creative thinking skills for analysis and evaluation of problems and cause-effect relationships.
• Students will understand and practice correct chemical-handling and laboratory safety principles.
• Students will practice good teamwork principles.
• Students will be able to give fluent and organized oral presentation, including the handling of questions and the use of appropriate visual aids.
• Students will be able to write comprehensive and detailed technical reports in formal engineering and short letter formats.

Materials and Supply Fees
The material and supply fees are included in the credit fee. The total credit fee (for 3 credits) is $2250, which is less than the standard credit fee.

Required Textbooks and Software
None. The lab manuals and protocols of the experimental modules that were developed by individual instructors will be available through Canvas. It is the student’s responsibility to let the instructor or graduate assistant know if they have problems accessing the material.

Recommended Materials
The students are encouraged to check all the resources listed in the lab manuals and protocols from the libraries or Internet. Note that most journal articles can be downloaded from a University computer. You can establish a VPN connection to establish your own computer as a hub of the University network.

Course Schedule
Please see Canvas for the group information, schedule, and location.

Attendance Policy, Class Expectations, and Make-Up Policy
• A student must be in attendance for the entire lab period of every module. Any unreasonable absence will result in zero point for the missed module. Excused absences are consistent with university policies in the undergraduate catalog (http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#attendance) and require appropriate documentation. The student also needs to contact the corresponding module instructor, module assistant as well as the coordinator prior to class via email.
• A 5-minute quiz is given at the beginning of each lab. Students will be given a warning for the first tardiness and missed quiz. Subsequent tardiness will result in a half letter-grade reduction in the final grade for each instance.
• Cell phone cannot be used when entering the lab.

Report Submission
• Pre-lab questions are due at the beginning of the lab before the experiment can be conducted.
• Post-lab questions are to be completed for every lab module and are due one week after the experiment for each student (NOT group). Also, every student still need to turn in the post-lab report individually even they, as a group, will turn in the complete final lab report (and/or individual oral exam) for a specific module.
• Each group will submit 3 final lab reports (and/or individual oral exam) throughout the whole semester. Please contact individual instructor for the format. The deadline for the lab report is two weeks after the completion of the experiment. The reports need to submit to the system (pdf) as well as through the email of the instructor (both pdf and docx file). Please work ahead to ensure your reports are finished on time. In the report, the principles or theories of the experiments need to be explained well in the introduction or background sections; however, it cannot be simply copied from the literatures or any websites. The students are expected to use their own words to describe the working mechanisms. The reports will be subjected to the Turnitin software to determine the originality. If complete or partial copying is found, at least a 50% deduction will be applied to the report.

Penalty for late submission:
• 80 % if turn in within 24 hours after deadline
• 50 % if turn in between 24 and 48 hours after deadline
• 0 % if fail to turn in before 48 hours after deadline.

Poster Presentation
• One formal poster presentation will be held in public (exact date and time to be announced later in the semester on Canvas). All students are required to prepare and present a final poster. Two or three students will be grouped as a team for the presentation. In the group, each student will have an opportunity to present his/her poster multiple times.
• The final version of the poster need to be submitted to the coordinator and the professionally printed poster needs to be ready at least 24 hours before the scheduled presentation. The information regarding poster printing services at UF can be found in the following link: http://print.at.ufl.edu/labmap.shtml. The cost for a standard size poster is approximately $20.00 – $30.00 at UF (http://print.at.ufl.edu/printingquestions.shtml). You can also print the poster at off-campus locations such as Target Copy or Kinkos.
• Professional dress code (formal or semiformal) is required for the presentation. Minimal requirements are solid-color pants/skirt, solid-color shirt/top, and dress shoes.
• The critical dates for the poster development can be found in the Canvas website. Failure to meet any deadlines will result in at least a 10% deduction of the team’s presentation score for each deadline missed.

Evaluation of Grades

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Pre-experimental homework</td>
<td>22 %</td>
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<tr>
<td>Post-experimental homework</td>
<td>33 %</td>
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<tr>
<td>Lab reports</td>
<td>24 %</td>
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<tr>
<td>Poster presentation</td>
<td>21 %</td>
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<td><strong>TOTAL</strong></td>
<td><strong>100 %</strong></td>
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The lab reports for each module will be normalized at the end of the semester.
Grading Policy
The final grading scale will be curved as appropriate. More information on UF grading policy may be found at: http://gradcatalog.ufl.edu/content.php?catoid=10&navoid=2020#grades

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) 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. 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/.

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/) 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

Campus Resources
Health and Wellness

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<th>U Matter, We Care:</th>
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<tr>
<td>If you or a friend is in distress, please contact <a href="mailto:umatter@ufl.edu">umatter@ufl.edu</a> or 352 392-1575 so that a team member can reach out to the student.</td>
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<tr>
<th>Counseling and Wellness Center:</th>
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<tr>
<td><a href="http://www.counseling.ufl.edu/cwc">http://www.counseling.ufl.edu/cwc</a>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.</td>
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<th>Sexual Assault Recovery Services (SARS)</th>
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<tr>
<td>Student Health Care Center, 392-1161.</td>
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<table>
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<tr>
<th>University Police Department</th>
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<tr>
<td>at 392-1111 (or 9-1-1 for emergencies), or <a href="http://www.police.ufl.edu/">http://www.police.ufl.edu/</a>.</td>
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### 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.

**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/).

[https://writing.ufl.edu/writing-studio/](https://writing.ufl.edu/writing-studio/).
