

CME 433: Chemical Engineering Laboratory II Course Syllabus

CME 433 Chemical Engineering Laboratory II

Semester/Term: Fall 2021

Credit Hours: 3 credits

Meeting Days/Time/Location:

Section 1: Tues/Thurs 8:00 AM to 11:50 AM FPAT 59 A, FPAT 160

Section 2: Tues/Thurs 1:00 PM to 4:50 PM FPAT 59 A, FPAT 160

Lead Instructor

Instructor: Sarah A. Wilson

Office: FPAT 163B

Email: s.wilson@uky.edu

Phone: 859-257-0796

Zoom Meeting ID: 848 3401 9261, Password: Wilson

Lab Managers

Academic Lab Manager: Nancy Miller

Office: 59C FPAT

Email: nancy.miller@uky.edu

Technical Lab Manager: Nick Cprek

Office: 61 FPAT

Email: nick.cprek@uky.edu

Teaching Assistants

Kübra Uzun

Email: kubra.uzun@uky.edu

Matthew Whitwer

Email: matthew.whitwer@uky.edu

Additional Faculty Assignments

Experiment	Lead Faculty	Email Address	Briefing Faculty
Distillation	Dziubla	thomas.dziubla@uky.edu	Miller
Membrane	Miller	nancy.miller@uky.edu	Wilson
Tubular Reactor	Wilson	s.wilson@uky.edu	Wilson
Ion Exchange	Shao	qshao@uky.edu	Miller
Heat Exchanger	Hauser	anastasia.hauser@uky.edu	Miller
Packed Column	Wilson	s.wilson@uky.edu	Wilson
Petro Skills	Wilson	s.wilson@uky.edu	Wilson

Course Description

CME 433 is a laboratory course emphasizing experimental work in the areas of heat transfer, mass transfer, separations, and chemical reaction kinetics. Special consideration is given to the development of experimental acumen, mathematical and statistical data handling, design calculations, report writing, and oral presentation.

Course Prerequisites

The prerequisites for CME 433 are as follows: CME 415, CME 420, CME 425, CME 432; prerequisite or concurrent CME 550; engineering standing. These prerequisites will be enforced, and those not

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meeting them will be dropped from the class. Exceptions to prerequisites will be granted only in special circumstances.

Student Learning Outcomes

CME 433 provides an opportunity for the application of fundamental chemical engineering concepts to a selected group of experiments that require the integration of sound scientific method, efficient project management, and effective communication skills for ultimate success.

After completing this course, students should be able to:

1. Develop and conduct appropriate experimentation for chemical engineering unit operations such as heat transfer, mass transfer, separations and reaction kinetics.
2. Analyze and interpret data for chemical engineering unit operations such as heat transfer, mass transfer, separations and reaction kinetics.
3. Use engineering judgment to draw conclusions for chemical engineering unit operations heat transfer, mass transfer, separations and reaction kinetics.
4. Communicate effectively with a range of audiences through written reports and/or oral presentations on a laboratory experiment.
5. Use modern computational tools to analyze and visualize data to be presented in written and oral reports.
6. Design a unit operation or process from experimental data that meet specified needs
7. Acquire and apply new knowledge as needed by incorporating technical literature and utilizing outside resources as part of written and oral reports.
8. Recognize ethical and professional responsibilities in laboratory settings and understand and contribute to the safety culture in the laboratory.

Required Laboratory Training

Students must complete mandatory safety training and receive certificates of completion before working in the CME 433 laboratory. For students who have successfully completed CME 432 (Spring 2021), these certificates are already on file and do not need to be re-submitted. However, transfer students, students who have been away on co-op and any individuals who have not taken the specified modules are required to complete the courses and to submit copies of the completion certificates prior to the first laboratory period.

The following three courses will need to be taken on-line: <http://ehs.uky.edu/classes/>

- Chemical Hygiene Plan/Laboratory Safety
- Emergency Eyewash/Shower Station
- Fire Extinguisher Training

All certificates should be submitted to Nancy Miller, Laboratory Manager.

Technology Information and Requirements

Course website: We will be using the Canvas system for our course website. For account help, contact UK's [Information Technology Customer Services online](#), by [email](#), or by phone at 859-218-HELP (4357). Please ensure that you have access to Canvas and Canvas notifications.

Technological requirements for the course: Students are required to have access to a device with sufficient capability to utilize Canvas, stream lecture videos and participate in Zoom conference calls.

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Course Structure

CME 433 consists of a total of three experiments (two hands-on experiments and one simulation). Each experiment (data collection and data analysis) is to be completed in teams of four or five, assigned at the beginning of the semester. Data collection for each hands-on experiment takes place during four four-hour laboratory periods in FPAT 59A. Two or three students will attend each lab period (as specified on the team assignments and course schedule), with lab duties split across team members. All data will be shared across the whole team, so it is important that teams are communicating across lab periods to ensure consistency of data. Data analysis is completed during three four-hour data analysis sessions which will take place in the FPAT Student Commons (FPAT 160). Following each experiment, teams are given a day off to complete their required major assignment, as detailed in the Course Elements section. During this writing session, students can choose to attend a Zoom meeting to receive help on their writing assignment.

Pre-lab Preparations: Lab instructions and videos are available on Canvas, along with any additional reference materials. Students are expected to read the instructions and review any available videos prior to the first day in the lab. Groups will then prepare a two-page briefing memo, a job safety analysis and their lab notebooks prior to the first lab day. Details and a rubric for the pre-lab prep can be found on Canvas.

Lab Briefing: On the first two days in the lab, each group will have a Briefing Meeting with Ms. Miller or Dr. Wilson. These meetings will take place at the beginning of lab session. Before the meeting, each group will submit their briefing memo and JSA to Canvas. At the briefing meeting, each team must present their experimental objectives, data collection plan and potential safety concerns and sources of error for their experiment. This is also the group's opportunity to ask any questions regarding the procedures prior to getting started in the lab. The instructor will also look over the group's lab notebook to ensure it has been sufficiently prepared with a summary of experimental goals and objectives, procedures and safety concerns.

Lab Period One: On the first day in the lab, group members should take the first 15 minutes to orient themselves in the lab, review the laboratory equipment and set up their lab station and individual duties for their experiment. The group can then begin completing the first day of laboratory duties, which typically consists of creating calibration curves and initial solution preparations. Once this is completed, experimental data can be collected for the remainder of the laboratory period. **As you complete your work in the lab, procedures, observations and data should be recorded in the laboratory notebook.**

Lab Periods Two through Four: On the remaining days in the lab, additional data will be collected. Working as a team, you should collect as much data analysis as possible through the lab period. **This means that you should not be leaving laboratory periods early** – if you think you have collected all of the data necessary, decide as a team how best to further your knowledge of the equipment and potential sources of error through further data collection. As you complete your work in the lab, procedures, observations and data should be recorded in the laboratory notebook.

Data Analysis: After completion of the experimental work, each team is allocated three four-hour laboratory periods for data analysis. Data analysis is considered a team activity and attendance at these sessions is required. If you are on quarantine, you will be expected to be present for the session through Zoom. It is expected that students will complete their data analysis sessions in the FPAT Student Commons (FPAT 160) and attendance will be taken. As you complete your work during data analysis, procedures, observations and sample calculations should be recorded in the laboratory notebook. These procedures will be graded as your sample calculations for your laboratory notebook appendices, which

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are submitted with each assignment. If necessary, you can take pictures of hand calculations that can be integrated into your notebook.

Course Assignments

Graded Course Assignments

Memo and Safety Briefings

- Laboratory briefings (x 2) 15%
- Laboratory incident reporting (one per lab period)
- Simulation pre-lab

Peer Reviews

- Initial draft of business proposal
- Peer review of business proposal 5%
- Initial draft of abstract
- Peer review of abstract
- Initial draft of full presentation

Teamwork

- Completion of teamwork assessments (x 3) – 10 points 5%
- Team performance – 70 points

Final Draft of Full Lab Report with Letter to the Editor 25%

Business Proposal 25%

Oral Presentation

- Group presentation – 125 points 25%
- Individual Question and Answer – 100 points
- Abstract – 25 points

Your team performance grade will be based on both peer assessments by fellow team members, as well as faculty input. In addition to the attendance policy detailed later in the syllabus, the course instructors and lab manager reserve the right to assess penalties for unsafe or unprofessional conduct in the laboratory or remote meeting sessions. The maximum penalty for a single infraction is 5 percentage points off the final course grade, although serious safety-related violations may result in suspension from the laboratory or dismissal from the class.

Description of Course Elements

Experimental Briefing Memo and Job Safety Analysis (JSA) (One per team per lab)

Prior to each experiment, each team will be responsible for creating a two-page memo outlining the information that will be discussed in the experimental briefing on the first day in the lab. Additionally, a job safety analysis will be performed on each experiment and submitted on Canvas. Details for the preparation of the memo and JSA, as well as a template for the assignment can be found on Canvas.

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Experimental Briefing Presentation (One for each first day in lab)

On the first day in lab, each group will complete a 10-minute briefing presentation to a Ms. Miller, Dr. Wilson or a course TA (see the Briefing Instructor listed on page 1 of the syllabus). A rubric for grading of the memo, JSA and briefing can be found on Canvas.

Notebook (maintained in both lab and data analysis)

The laboratory notebook is a record of the planning and execution of all laboratory work. In addition to acting as the permanent record for raw experimental data, the notebook forms the basis for project planning and organization. It should be the primary record for the development of data reduction methods, sample calculations, error analysis, and preliminary design calculations. The lab notebook should be shared as a team and used throughout the data collection and data analysis process.

Copies of notebook pages are to be submitted by each team member as an appendix in each communication assignment. Grading (as part of all major assignments) will be based on content, organization, technical accuracy, and completeness.

Teamwork

Teamwork is a very important aspect of CME 433, and teams will be required to establish their own internal procedures for preparation of the experimental plan, operation of equipment, project notebook entries, data analysis, design calculations and all other work. Data acquisition and analysis are crucial components of the laboratory learning experience, and all members of each team are required to be in attendance during all sessions. At the conclusion of each experiment, all students will have an opportunity to evaluate the performance of their team members relative to their technical contributions, participation and overall commitment to the team effort. The final team performance grade for each individual will be based on input provided by the participating faculty, lab manager, and the team evaluations.

Laboratory incident reporting

At the end of each lab period, each group will be required to submit an incident report detailing any safety incidents that occurred throughout the laboratory period. If there are no safety incidents, a positive safety-related observation can be recorded.

Lab One: Written Full Lab Report

Upon completion of the first experiment, each team member will submit a written full lab report (ten pages, plus figures and appendix – raw and manipulated data and laboratory notebook pages) detailing the experiment. While the team must work together to complete the data analysis, the preparation of the written report (presentation of all results and interpretation) is to be completed individually. A signed statement of originality must be included as a cover page to every report. Reports that are submitted without a statement of originality will not be graded and will be marked as late. Specific details with regards to preparation of the full lab report can be found on Canvas. Full reports are due on the date indicated in the course schedule. See below for the late policy for writing assignments.

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Lab Two: Business Proposal

Each student will be responsible for writing a five-page business proposal, with the goal of convincing a company to select your design for their project. Details on the business proposal are provided on Canvas. An appendix will be submitted with the business proposal that includes a written summary of the data analysis and design process, raw and manipulated data tables and copies of the laboratory notebook. The first draft of the business proposal submitted to Canvas for distribution during peer-revision. A signed statement of originality must be included as a cover page to every business proposal. Business proposals that are submitted without a statement of originality will not be graded and will be marked as late.

Lab Two: Peer Revision

Business proposals will undergo a peer-review process. After the initial submission, reports will be distributed to another student from your class. Students will review the business proposal using the guidelines provided on Canvas. Reviews will be submitted one lab period after the initial submission of the report. You will then have one additional lab period to revise your work and write a "Letter to the editor" explaining how you implemented the suggestions provided by your peers (or why you chose not to implement a suggestion). Additional information can be found on Canvas.

Lab Three: Group Oral Presentation

Each team will be responsible for one thirty-minute group oral presentation; the specific dates for this activity are provided in the course schedule. Following the group presentations, each individual team member will meet with the grading faculty to answer questions related to the lab investigation. Individual question sessions will last five minutes per teammate. An appendix will be submitted with the oral report that includes a written summary of the data analysis and design process, raw and manipulated data tables and copies of the laboratory notebook. Additionally, a summary of the peer feedback must be included. This can be submitted as a team-based assignment and must be submitted by 10:00 PM on the day before the presentation. Additional information on the oral presentation can be found on Canvas.

Lab Three: Abstract

As part of the oral presentation, each student will be required to submit an accompanying abstract, submitted to Canvas portal on the date listed on the course schedule. The purpose of the abstract is to summarize the entire lab report including objective, techniques, results, design and conclusions. The abstract should stand alone independent of the report and should communicate the essential elements and findings of the project. A convenient way to draft the abstract is to write one or two sentences summarizing each major section of the lab report. The abstract should always present the key quantitative results measured in the lab investigation but should never cite tables or figures from the paper. The abstract should not exceed 250 words. To improve your abstracts prior to submission, you will be required to complete a rough draft of your abstract for the presentation peer review session. Your rough draft will be submitted to Canvas and you will receive a grade for completion of the rough draft. Final submissions of your abstract will include a scan of the abstract rough draft with peer feedback.

Lab Three: Peer Review

Teams will participate in a peer review process of the oral presentations and abstracts during the class period prior to the presentations to faculty. Each round of students will be divided into two groups of 3-4 teams. These teams will be given access to a Zoom room where each team will be allowed 30 minutes to give their presentation followed by 30 minutes for peer feedback. Presentation feedback from the peer

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review session will be compiled by each team and must be submitted by 10:00 PM on the day before the presentation. Abstracts will be peer reviewed in teams of two and the peer reviewed abstract will be scanned and submitted to Canvas. Each student will get a grade associated with the quality of their peer review.

Course Grading

Course Grading Scale

Grading will be based on each student's composite (raw) score; scores in the range $> 90\%$ will be guaranteed a grade of "A", 80% or above at least a "B", 70% or above at least a "C", and 60% or above at least a "D". For students with grades near the endpoints in the above distribution, consideration may be given to attendance and overall course participation, as well as to performance trends over the course of the semester.

Please note that the last day to withdraw from a class for the Fall term is September 10th.

Mid-term Grade

Mid-term grades will be posted in myUK by the deadline established in the [Academic Calendar](#).

Grading Disputes

All grading disputes must be brought to the attention of Dr. Wilson within one week of the grade being posted to Canvas.

Minimum Course Requirements

In order to pass the course, students must receive a minimum passing grade ($\geq 60\%$) on each of the two written assignments and the oral presentation, independent of any penalties assessed for late submission. Each student will have one opportunity to resubmit a revised assignment if their grade falls between a 40 and 60%. This resubmission will be graded and a passing grade ($\geq 60\%$) will be required for the student to continue on in the course. The grade of the initial submission will be averaged with the grade of the resubmission to count towards the final grade on the assignment, with a maximum average grade of 60%. Those students scoring lower than 40% on their initial submission will not be permitted to resubmit a revised assignment.

Major Assignment Grading Scale

In scientific writing, there is always room for improvement. Therefore, you will be graded such that a perfect score (100%) is a paper that has no room for improvement. The grading scale that is used for each element of your major assignment is as follows:

- 0 Has not been included in the assignment.
- 1 Mostly incomplete or addressed incorrectly; significant errors.
- 2 Somewhat complete or correctly addressed, significant errors present.
- 3 Mostly complete or correctly addressed; some small errors present.
- 4 Mostly complete or correctly addressed; no errors present.
- 5 Excellently addressed; no errors present.

Late assignment policy

Major assignments for each laboratory experiment are due on the date indicated in the course schedule. If there is a disagreement between the schedule provided and the assignment due date on Canvas, the

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course schedule should be followed unless discussed with Dr. Wilson. All major assignments are due by 10:00 PM on the date indicated and should be submitted digitally as a single file in PDF format to the appropriate Canvas assignment. Late major assignments will be assessed a penalty of 10% per day (weekend counts as one day). No reports will be accepted more than three days after the published due date. Minor assignments and group assignments will not be accepted after the deadline indicated on Canvas unless a valid excuse is provided.

Excused late assignment policy

Each student will be allowed one opportunity to submit a major writing assignment (Full Report or Business Proposal) up to 48 hours late. To receive this accommodation, a letter of explanation must be uploaded to the assignment on Canvas by the original deadline for the assignment. The assignment must then be submitted within 48 hours of the deadline. If the assignment is not submitted within 48 hours of the original deadline, a late penalty of 10% per day (weekend counts as one day) from the original deadline will be applied. No reports will be accepted more than three days after the published due date.

Resources

Computer Lab

The computer lab for data analysis is located in Room 160 FPAT is designated for activities related to chemical engineering and materials engineering coursework. During CME 433 laboratory hours, priority is given to CME 433 lab groups. They are expected to be working on data analysis, design calculations, and other activities directly related to CME 433.

Students are expected to manage all files and materials related to their CME 433 activities; students should maintain back-ups of all necessary data and related files.

Presentation U! Peer Tutoring

Students can receive free tutoring for communication projects in any form for any course, including research papers, essays, lab reports, presentations, infographics, ePortfolios, and iPad related projects. Tutoring sessions can either be scheduled to discuss an assignment or students can email their assignment to a tutor to receive feedback through email. Visit here to schedule an appointment: <https://presentationu.mywconline.com/>

Attendance Policy

Attendance

Attendance at all scheduled in-person laboratory sessions and remote data analysis sessions is mandatory. Laboratory sessions start promptly at 8 AM and 1 PM. Students arriving more than 15 minutes late to any session (including data analysis) will receive a penalty of one percentage point off the overall course grade. Students who miss a scheduled laboratory or data analysis session (i.e., greater than 60 minutes late) without a valid excuse will receive a penalty of four percentage points. Regardless of the excused or unexcused status of an absence, the Laboratory Manager can require the student to complete a make-up session, depending on the circumstances. A make-up session is considered class time. Being late or missing a make-up session is equivalent to being late or missing a regular class time.

Students with two or more unexcused absences may be required to drop the course or may be assigned a grade of "0" on the specific laboratory impacted by the absence(s). Such actions are at the discretion of the course instructor.

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For students who miss a scheduled lab period, an email or Teams message should be sent to your teammates, the laboratory manager (nancy.miller@uky.edu) and the course instructor (s.wilson@uky.edu) prior to the start of the laboratory period. All students who are not scheduled for an in-person laboratory session should be available to step in for a lab partner that may be sick or on quarantine. It is also the student's responsibility to arrange a schedule to make up missed effort. Failure to properly inform or coordinate with your team will be reflected in the team scores.

Excused Absences

Because illness or emergencies may occur across the semester that will not easily be documented, a Flexibility Request Form has been included in Canvas. If you need to be excused from a class or an assignment, the Instructors ask that you complete the Flexibility Request Form. Completion of the Flexibility Request Form does not guarantee that you will be excused or granted an extension.

Excused Absences: *Senate Rules 5.2.5.2.1* defines the following as acceptable reasons for excused absences: (a) significant illness, (b) death of a family member, (c) trips for members of student organizations sponsored by an educational unit, trips for University classes, and trips for participation in intercollegiate athletic events, (d) major religious holidays, (e) interviews for graduate/professional school or full-time employment post-graduation, and (f) other circumstances found to fit "reasonable cause for nonattendance" by the instructor of record. Students should notify the professor of absences prior to class when possible.

If a course syllabus requires specific interactions (e.g., with the instructor or other students), in situations where a student's total EXCUSED absences exceed 1/5 (or 20%) of the required interactions for the course, the student shall have the right to request and receive a "W," or the Instructor of Record may award an "I" for the course if the student declines a "W." (*Senate Rules 5.2.5.2.3.1*)

Religious Observances: Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays. *Senate Rules 5.2.5.2.1(4)* requires faculty to include any notification requirements within the syllabus. If no requirement is specified, two weeks prior to the absence is reasonable and should not be given any later. Information regarding major religious holidays may be obtained through [the Ombud's website](#) or calling 859-257-3737.

Verification of Excused Absence: Students may be asked to verify their absences in order for them to be considered excused. *Senate Rule 5.2.5.2.1* states that faculty have the right to request appropriate verification when students claim an excused absence due to: significant illness; death in the household, trips for classes, trips sponsored by an educational unit and trips for participation related to intercollegiate athletic events; and interviews for full-time job opportunities after graduation and interviews for graduate and professional school. (Appropriate notification of absences due to University-related trips is required prior to the absence when feasible and in no case more than one week after the absence.)

Make-Up Work: Students missing any graded work due to an excused absence are responsible: for informing the Instructor of Record about their excused absence within one week following the period of the excused absence (except where prior notification is required); and for making up the missed work. The instructor must give the student an opportunity to make up the work and/or the exams missed due to the excused absence, and shall do so, if feasible, during the semester in which the absence occurred. The instructor shall provide the student with an opportunity to make up the graded work and may not simply calculate the student's grade on the basis of the other course requirements, unless the student

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agrees in writing. According to *SR 5.2.5.2.2*, if a student adds a class after the first day of classes and misses graded work, the instructor must provide the student with an opportunity to make up any graded work.

Excused Absences for Military Duties: If a student is required to be absent for one-fifth or less of the required course interactions (e.g., class meetings) due to military duties, the following procedure (per *SR 5.2.5.2.3.2*) shall apply:

1. Once a student is aware of a call to duty, the student shall provide a copy of the military orders to the Director of the Veterans Resource Center. The student shall also provide the Director with a list of his/her courses and instructors.
2. The Director will verify the orders with the appropriate military authority, and on behalf of the military student, notify each Instructor of Record via Department Letterhead as to the known extent of the absence.
3. The Instructor of Record shall not penalize the student's absence in any way and shall provide accommodations and timeframes so that the student can make up missed assignments, quizzes, and tests in a mutually agreed upon manner.

Unexcused Absences: If an attendance/interaction policy is not stated in the course syllabus or the policy does not include a penalty to the student, the instructor cannot penalize a student for any unexcused absences. (*SR 5.2.5.2.3.3*)

Prep Week and Reading Days: Per *Senate Rules 5.2.5.6*, the last week of instruction of a regular semester is termed "Prep Week." This phrase also refers to the last three days of instruction of the summer session and winter intersession. The Prep Week rule applies to ALL courses taught in the fall semester, spring semester, and summer session, including those taught by distance learning or in a format that has been compressed into less than one semester or session. This rule does not apply to courses in professional programs in colleges that have University Senate approval to have their own calendar.

Make-up exams and quizzes are allowed during Prep Week. In cases of "Take Home" final examinations, students shall not be required to return the completed examination before the regularly scheduled examination period for that course. No written examinations, including final examinations, may be scheduled during the Prep Week. No quizzes may be given during Prep Week. No project/lab practicals/paper/presentation deadlines or oral/listening examinations may fall during the Prep Week unless it was scheduled in the syllabus AND the course has no final examination (or assignment that acts as a final examination) scheduled during finals week. (A course with a lab component may schedule the lab practical of the course during Prep Week if the lab portion does not also require a Final Examination during finals week.) Class participation and attendance grades are permitted during Prep Week. The *Senate Rules* permit continuing into Prep Week regularly assigned graded homework that was announced in the class syllabus.

For fall and spring semester, the Thursday and Friday of Prep Week are study days (i.e. "Reading Days"). There cannot be any required "interactions" on a Reading Day. "Interactions" include participation in an in-class or online discussion, attendance at a guest lecture, or uploading an assignment. See *Senate Rules 9.1* for a more complete description of required interactions.

Sharing of Course Resources

For CME 433, all laboratory notebooks, data acquisition, data analysis, and calculations completed during the laboratory period as a team is considered common property of the team. However, the preparation of oral presentations and written reports (including the generation of data plots and all other

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report elements) is considered to be an individual activity. All writing and related elements included in formal CME 433 reports are to be the work of the individual student. The only exception in this regard would be spreadsheets included as part of a report appendix, which can be considered to be a component of the laboratory notebook, and therefore team property.

In CME 433, students are prohibited from:

- Accessing in any form laboratory reports from previous semesters; such activity will be considered cheating.
- Accessing or sharing laboratory reports from the current semester with other students enrolled in CME 433. This includes sharing lab reports (or drafts) with students from your lab team.
- Utilizing another person or services either in person or online to aid in the writing of an assignment.

Sharing data with other CME 433 laboratory groups

It is understood that students may confer with other laboratory groups regarding general operational aspects of the individual experiments. This is acceptable. However, students are expressly prohibited from sharing data sets, design results, etc. with other lab groups. If there are issues or questions regarding experimental methods or design, students should confer with the teaching assistants, laboratory manager, or individual faculty members.

CME 433 Specific Plagiarism Policies

More information regarding university plagiarism and cheating policies can be found later in the syllabus.

Plagiarism in CME 433 is a serious offense. To ensure that all students understand the importance of submitting original work, a signed cover letter will be attached to each submitted major assignment containing the following statement. A template for this cover letter can be found on the course Canvas site.

Consistent with the University of Kentucky's efforts to enhance student learning, foster honesty, and maintain integrity in our academic processes, the Turnitin plagiarism software will be used to compare your written assignments with multiple sources. The tool will compare each paper you submit to an extensive database of prior publications, papers and websites, providing links to possible matches and a 'similarity score.' The tool does not determine whether or not plagiarism has occurred. Instead, course faculty will make a complete assessment and judge the originality of your work. All submissions to this course may be checked using this tool. Your submissions will be retained in the Global Turnitin repository.

Laboratory Safety

General Lab Safety Rules, Procedures and Responsibilities

- No experimental apparatus is to be operated without the presence of a faculty instructor, lab manager or teaching assistant (TA).
- No experimental equipment is to be operated outside of regular laboratory class hours without the explicit permission of the Laboratory Manager (Ms. Miller). In such cases, appropriate instructional personnel must be present.
- Students must use or wear all prescribed protective equipment. Appropriate attire is required for entering the laboratory.

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- Be aware of the location of all exits, showers, eye wash stations, first aid kits, fire extinguishers, spill kits, and fire alarm pull boxes.
- Be aware of the activity of those working around you at all times.
- Students must be familiar with the specific safety requirements of an experimental apparatus prior to operation.
- Do not operate equipment outside of the procedures and limitations established by the TA, lab manager and/or instructor responsible for that equipment. Ask for assistance if you are uncertain as to the safe operation of any equipment, controllers, etc.
- Report any broken or improperly functioning equipment to the lab manager, instructor or TA.
- Report any hazardous conditions immediately to the lab manager, instructor or TA.
- Inform the lab manager, instructor or TA if you have used the last of any laboratory consumables.
- Keep the lab area clean. Everyone who uses the lab needs to clean up after themselves. Please properly dispose of waste, put away equipment that belongs in cabinets, and keep the floor, counter space and fume hoods clean and clear.

CME 432 Laboratory Rules

- There will be NO SMOKING, DRINKING or EATING in the laboratory.
- There will be NO SHORTS or SANDALS worn in the laboratory. Please wear LONG PANTS, and CLOSED-TOED SHOES. Legs and feet must be covered.
- SAFETY GLASSES and LAB COATS are to be worn at all times.
- GLOVES are to be worn when handling chemicals.
- If you have long hair, it needs to be tied back. Long sleeve shirts must be rolled up, and all watches, rings and necklaces must be removed.
- Appropriate clothing is to be worn in the laboratory at all times. If you are not appropriately dressed, you will be asked to leave the laboratory.

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Commitment to Equity and Inclusion

The Chemical and Materials Engineering Department believes that the diversity of the student body contributes to our creativity, innovation and success as scientists and engineers. To support our efforts in creating a department that is inclusive and supportive of all our student identities, we have established a communication pathway for you to express your concerns related to equity and inclusion within the department. If you do not feel comfortable reaching out to your course instructor or another faculty member within the department, please contact one of the student or faculty representatives for the Diversity, Equity and Inclusion (DEI) committee:

- ChE Undergraduate Representative: Halle Shannon, halledanielle218@uky.edu
- MSE Undergraduate Representative: Mikaila Risser, mikaila.risser@uky.edu
- CME Faculty Representative: Sarah Wilson, s.wilson@uky.edu

Representatives will report any concerns or complaints to the DEI committee. While they will do their best to maintain anonymity when reporting to the committee, if there is a concern for your personal or psychological safety, they may reveal your name to the committee or be directed by the committee to submit a report on your behalf to the University of Kentucky Center for Support and Intervention.

In an effort to create a learning environment that supports a diversity of thoughts, perspectives and experiences, and honors one's personal identity (including race, gender, class, sexuality, religion, ability, socioeconomic status, etc.), please inform the instructor:

- If you have a name and/or set of pronouns that differ from those that appear in your official University of Kentucky records.
- If you feel like your performance in the class is being impacted by your experiences outside of class.
- If there are aspects of the design, instruction, and/or experiences within this course that result in barriers to your inclusion or accurate assessment of achievement.

For College resources related to diversity and inclusion, please visit this website: <https://www.engr.uky.edu/diversity-and-inclusivity>. For University resources related to diversity and inclusion, please visit this website: <https://www.uky.edu/inclusiveexcellence/>

Mental Health and Wellness

University life can be a demanding and stressful experience. Please know there are numerous resources offered by the counseling center to support student growth and assist students with mental health, academic and/ or other personal concerns that might interfere with academic performance or a sense of personal well-being while at UK.

- **Counseling Center:** 859-257-8701 | www.uky.edu/counselingcenter/ A free resource staffed by licensed clinicians, the UKCC is available to provide therapy services to students as well as a number of other services focused on wellbeing. You may call 859-257-8701 to schedule an appointment or schedule online at this link <https://www.uky.edu/counselingcenter/schedule-your-first-appointment>. If you would like to speak with a clinician outside of normal business hours or prefer to speak over the phone, the number below can be dialed, and option 1 can be selected to speak to a mental health clinician. 24-hour Crisis Consultation: (859) 257-8701
- **Disability Resource Center (DRC):** 859-257-2754 | <https://www.uky.edu/DisabilityResourceCenter/> Students with documented physical health, mental health, or learning disability diagnoses (chronic or temporary) may receive assistance and support from

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this office to ensure equal access to university programs and services inside the classroom and out. Visit website to register and request formal accommodations from the DRC.

- **Transformative Learning:** www.uky.edu/tl/ This office provides academic coaching, tutoring, study skills training, and other academic resources to students in order to enhance students' academic experience and success. Visit the website for more information, including hours, locations and to make appointments.
- **For additional resources and programs focused on mental health and wellbeing, visit:** <https://wellkentucky.uky.edu/>

When it comes to mental health, it is especially important for you to advocate for yourself and your fellow students. If you notice a change in the behavior of one of your classmates or are concerned about their wellbeing, please reach out to your instructor or submit a report detailing your concern to UK's Center for Support and Intervention: <https://www.uky.edu/concern/>

For a summary of College and University resources to support student mental health and wellness, please visit this website: <https://www.engr.uky.edu/students/student-success/student-resources>

Mask and Distancing Policy

In accordance with University guidelines, students must wear UK-approved face coverings in the classroom and academic buildings (e.g. faculty offices, laboratories, libraries, performance/design studios, and common study areas where students might congregate). **If UK-approved face coverings are not worn over the nose and mouth, students will be asked to leave the classroom.**

Procedure for Resolving Technical Complaints

The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

Meetings of this course may be recorded. All video and audio recordings of lecturers and class meetings, provided by the instructors, are for educational use by students in this class only. They are available only through the Canvas shell for this course and are not to be copied, shared, or redistributed.

As addressed in the Student Code of Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.

If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an "authorization of use" form by a faculty member.

Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor. All content for this course, including handouts, assignments, and lectures are the intellectual property of the instructors and cannot be reproduced or sold without prior permission from the instructors. A student

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may use the material for reasonable educational and professional purposes extending beyond this class, such as studying for a comprehensive or qualifying examination in a degree program, preparing for a professional or certification examination, or to assist in fulfilling responsibilities at a job or internship

Procedure for Resolving Technical Complaints

Any technological issues should be brought to the attention of the instructor at the earliest opportunity. Technical issues related to the delivery of pre-lecture video overviews and Echo360 lectures should be brought to the attention of the instructor prior to the scheduled lecture and an alternate means of delivery will be identified. Help with Canvas related issues is available by clicking the Help icon within Canvas.

In the event of a Canvas outage, homework files should be submitted directly to the instructor via email. Exams will be administered in a proctored environment either on campus. In the event of a Canvas outage, the proctor will provide an electronic version of the exam to the student, collect the completed exam, and submit it directly to the instructors.

Online Behavior Policies

Student attendance of Zoom meetings will abide by the Classroom Code of Conduct. Students must not be distracting during a meeting. If a student is a distraction, they will be asked to leave the meeting and can have their Course Participation points deducted, as seen fit by the instructors.

Accommodations Due to Disability

In accordance with federal law, if you have a documented disability that requires academic accommodations, please inform your instructor as soon as possible during scheduled office hours. In order to receive accommodations in a course, you must provide your instructor with a Letter of Accommodation from the Disability Resource Center (DRC). The DRC coordinates campus disability services available to students with disabilities. It is located on the corner of Rose Street and Huguelet Drive in the Multidisciplinary Science Building, Suite 407. You can reach them via phone at (859) 257-2754, [via email \(drc@uky.edu\)](mailto:drc@uky.edu) or visit their [website \(uky.edu/DisabilityResourceCenter\)](http://uky.edu/DisabilityResourceCenter). DRC accommodations are not retroactive and should therefore be established with the DRC as early in the semester as is feasible.

Non-Discrimination Statement and Title IX Information

In accordance with federal law, UK is committed to providing a safe learning, living, and working environment for all members of the University community. The University maintains a comprehensive program which protects all members from discrimination, harassment, and sexual misconduct. For complete information about UK's prohibition on discrimination and harassment on aspects such as race, color, ethnic origin, national origin, creed, religion, political belief, sex, and sexual orientation, please see [the electronic version of UK's Administrative Regulation 6:1 \("Policy on Discrimination and Harassment"\) \(https://www.uky.edu/regs/ar6-1\)](https://www.uky.edu/regs/ar6-1). In accordance with Title IX of the Education Amendments of 1972, the University prohibits discrimination and harassment on the basis of sex in academics, employment, and all of its programs and activities. Sexual misconduct is a form of sexual harassment in which one act is severe enough to create a hostile environment based on sex and is prohibited between members of the University community and shall not be tolerated. For more details, please see [the electronic version of Administrative Regulations 6:2 \("Policy and Procedures for Addressing and Resolving Allegations of Sexual Assault, Stalking, Dating Violence, Domestic Violence, and Sexual Exploitation"\) \(https://www.uky.edu/regs/ar6-2\)](https://www.uky.edu/regs/ar6-2). Complaints regarding violations of University policies on discrimination, harassment, and sexual misconduct are handled by the Office of Institutional Equity and Equal Opportunity (Institutional Equity), which is located in 13 Main Building

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and can be reached by phone at (859) 257-8927. You can also visit [Institutional Equity's website](https://www.uky.edu/eo) (<https://www.uky.edu/eo>).

Faculty members are obligated to forward any report made by a student related to discrimination, harassment, and sexual misconduct to the Office of Institutional Equity. Students can confidentially report alleged incidences through the [Violence Intervention and Prevention Center](https://www.uky.edu/vipcenter) (<https://www.uky.edu/vipcenter>), [Counseling Center](https://www.uky.edu/counselingcenter) (<https://www.uky.edu/counselingcenter>), or [University Health Service](https://ukhealthcare.uky.edu/university-health-service/student-health) (<https://ukhealthcare.uky.edu/university-health-service/student-health>).

Reports of discrimination, harassment, or sexual misconduct may be made to Institutional Equity [here](#).

Academic Integrity– Prohibition on Plagiarism (Senate Rules 6.3.1)

Per University policy, students shall not plagiarize, cheat, or falsify or misuse academic records. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the University may be imposed. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty.

Senate Rule 6.3.1 states that all academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording, or content from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

Plagiarism includes reproducing someone else's work (including, but not limited to a published article, a book, a website, computer code, or a paper from a friend) without clear attribution. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be, except under specific circumstances (e.g. Writing Center review, peer review) allowed by the Instructor of Record or that person's designee. Plagiarism may also include double submission, self-plagiarism, or unauthorized resubmission of one's own work, as defined by the instructor.

Students may discuss assignments among themselves or with an instructor or tutor, except where prohibited by the Instructor of Record (e.g. individual take-home exams). However, the actual work must be done by the student, and the student alone, unless collaboration is allowed by the Instructor of Record (e.g. group projects).

When a student's assignment involves research in outside sources or information, the student must carefully acknowledge exactly what, where and how he/she has employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain.

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

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Academic Integrity – Prohibition on Cheating (Senate Rules 6.3.2)

Cheating is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

Academic Integrity – Prohibition on Falsification/Misuse of Academic Records (SR 6.3.3)

Maintaining the integrity, accuracy, and appropriate privacy of student academic records is an essential administrative function of the University and a basic protection of all students. Accordingly, the actual or attempted falsification, theft, misrepresentation or other alteration or misuse of any official academic record of the University, specifically including knowingly having unauthorized access to such records or the unauthorized disclosure of information contained in such records, is a serious academic offense. As used in this context, "academic record" includes all paper and electronic versions of the partial or complete permanent academic record, all official and unofficial academic transcripts, application documents and admission credentials, and all academic record transaction documents. The minimum sanction for falsification, including the omission of information, or attempted falsification or other misuse of academic records as described in this section is suspension for one semester.

Bias Incident Support Services

Bias Incident Support Services (BISS) provides confidential support and advocacy for any student, staff, or faculty member impacted by bias, hatred, and/or an act of identity-based violence. BISS staff aid impacted parties in accessing campus and community resources, including the Bias Incident Response Team, the University's official reporting system for acts that negatively impact a sense of belonging. Campus and community consultation and educational opportunities centered on inclusion, diversity, equity and belonging is a resource also provided by BISS. For more detailed information please visit the [BISS website](#) or contact them [via email](#).

Counseling Center

The UK Counseling Center (UKCC) provides a range of confidential psychological services to students enrolled in 6 credit hours or more, psychoeducational outreach programming (including QPR suicide prevention), and consultation to members of the UK community (students, faculty, staff, administrators, parents, concerned others). Please visit the website <https://www.uky.edu/counselingcenter/> for more detailed information, or call 859.257.8701.

Martin Luther King Center

The Martin Luther King Center (MLKC) supports an inclusive learning environment where diversity and individual differences are understood, respected, and appreciated as a source of strength. The MLKC's year-round programs and activities that focus on the importance of cultural awareness and cross-cultural understanding support its three primary goals: 1) sponsoring cultural and educational programming; 2) offering opportunities for student support and development; and 3) through programmatic linkages with a wide variety of civic and community agencies, promoting community outreach, engagement, and collaboration. Students can reach the MLKC via phone at (859) 257-4130, by visiting them in Gatton Student Center Suite A230, [via email](#), and by visiting [the MLKC website](#).

Office of LGBTQ Resources*

UK is committed to supporting students and upholding the University's efforts to promote inclusion among our community. UK faculty and staff employees support inclusion and diversity throughout the

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University, including the ways in which faculty structure classroom conversations and manage those dynamics. To assist in these efforts, students are welcome to provide the names and pronouns they prefer. One easy way to do this is by using the pronoun feature of UK's Name Change Form. (More information about the form can be found on the [Office of LGBTQ*'s website](#).) Otherwise, students can provide this information to faculty members directly.

Discrimination based on sexual orientation, gender expression, and gender identity is prohibited at UK. If you have questions about support, advocacy, and community-building services related to sexual orientation, gender expression, or gender identity, students are encouraged to visit the [website of the Office of LGBTQ* Resources](#).

Veteran's Resource Center

Being both a member of the military community and a student can bring some complexities. If you are a member of the military or a military veteran or dependent, please let me know when these challenges arise. Drill schedules, calls to active duty, mandatory training exercises, issues with GI Bill disbursement, etc. can complicate your academic life. Please let me know if you experience complications and I will do my best to work with you.

If you are a military student serving in the National Guard or Reserve it is in your best interest to let all of your professors know that immediately. You might also consider sharing a copy of your training schedule as well as any orders activating you. The Veterans Resource Center (VRC) can provide a letter for your professors validating your absence but be aware that there is no current UK policy protecting military students who miss class due to short term activations such as long weekend drills, annual training or emergency activations. See the instructor or the VRC for details.

The VRC is a great resource for members of our military family. If you have questions regarding your VA benefits or other related issues, the VRC has a full complement of staff to assist you. The VRC also provides study and lounge space, as well as free printing. Please visit the [VRC website](#), [email the DRC](#), visit them in the basement of Erikson Hall, or call the director, Tony Dotson, at (859) 257-1148.

Violence Intervention and Prevention (VIP) Center

If you experience an incident of sex- or gender-based discrimination or interpersonal violence, we encourage you to report it. While you may talk to a faculty member or TA/RA/GA, understand that as a "Responsible Employee" of the University these individuals MUST report any acts of violence (including verbal bullying and sexual harassment) to the University's Title IX Coordinator in the IEEO Office. If you would like to speak with someone who may be able to afford you confidentiality, you can visit the [Violence Intervention and Prevention \(VIP\) Center's website](#) (offices located in Frazee Hall, lower level; [email them](#); or call (859) 257-3574), [the Counseling Center's \(CC\) website](#) (106 Frazee Hall; (859)), and the [University Health Services \(UHS\) website](#); the VIP Center, CC, and UHS are confidential resources on campus. **The VIP Center accepts walk-in appointments.**

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Proposed Schedule

	Round 1 Lab/Data Analysis	Assignments	Round 2 Lab/Data Analysis	Assignments
Tuesday 24-Aug	Lab Intro Session		Lab Intro Session	
Thursday 26-Aug	Laboratory 1 Period 1 (a)	Briefing/JSA, In person briefing	No Class	
Tuesday 31-Aug	Laboratory 1 Period 2 (b)	In person briefing	No Class	
Thursday 2-Sep	Laboratory 1 Period 3 (a)		No Class	
Tuesday 7-Sep	Laboratory 1 Period 4 (b)		No Class	
Thursday 9-Sep	Data Analysis 1 Period 1		Laboratory 1 Period 1 (a)	Briefing/JSA, In person briefing
Tuesday 14-Sep	Data Analysis 1 Period 2		Laboratory 1 Period 2 (b)	In person briefing
Thursday 16-Sep	Data Analysis 1 Period 3		Laboratory 1 Period 3 (a)	
Tuesday 21-Sep	Full Lab Report (Due 9/22)		Laboratory 1 Period 4 (b)	
Thursday 23-Sep	Laboratory 2 Period 1 (a)	Briefing/JSA, In person briefing	Data Analysis 1 Period 1	
Tuesday 28-Sep	Laboratory 2 Period 2 (b)	In person briefing	Data Analysis 1 Period 2	
Thursday 30-Sep	Laboratory 2 Period 3 (a)		Data Analysis 1 Period 3	
Tuesday 5-Oct	Laboratory 2 Period 4 (b)		Full Lab Report (Due 10/6)	
Thursday 7-Oct	Data Analysis 2 Period 1		Laboratory 2 Period 1 (a)	Briefing/JSA, In person briefing
Tuesday 12-Oct	Data Analysis 2 Period 2		Laboratory 2 Period 2 (b)	In person briefing
Thursday 14-Oct	Data Analysis 2 Period 3		Laboratory 2 Period 3 (a)	
Tuesday 19-Oct	Business Proposal (RD due 10/21)		Laboratory 2 Period 4 (b)	
Thursday 21-Oct	PetroSkills Period 1	Pre-lab prep, Rough Draft Business Proposal	Data Analysis 2 Period 1	
Tuesday 26-Oct		Fall Break	Data Analysis 2 Period 2	Fall Break
Thursday 28-Oct	PetroSkills Period 2			
Tuesday 2-Nov	PetroSkills Period 3		Data Analysis 2 Period 3	
Thursday 4-Nov	PetroSkills Period 4		Business Proposal (RD due 11/9)	
Tuesday 9-Nov	PetroSkills Period 5		PetroSkills Period 1	Pre-lab prep, Rough Draft Business Proposal
Thursday 11-Nov	PetroSkills Period 6		PetroSkills Period 2	
Tuesday 16-Nov	Oral Presentation Peer Review		PetroSkills Period 3	
Thursday 18-Nov	Oral Presentation		PetroSkills Period 4	
Tuesday 23-Nov		Thanksgiving	PetroSkills Period 5	
Thursday 25-Nov				Thanksgiving
Tuesday 30-Nov			PetroSkills Period 6	Oral Presentation Peer Review
Thursday 2-Dec			Oral Presentation	
Tuesday 7-Dec				Oral Presentation
Thursday 9-Dec		Reading Day - No Classes		Reading Day - No Classes