MEMORANDUM FOR STUDENTS ENROLLED IN CHEN 4360 – Section 001

SUBJECT: CHEN 4360 – Chemical Engineering Lab II - Administrative Instructions

Laboratory times: TTh 1:00 – 3:30 pm, RBN 1033/1034

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Office Hours: MWF 12-2 or by appt

Welcome to CHEN 4360 – Chemical Engineering Lab II. This course will provide opportunities for the students to apply scientific and engineering principles learned in lecture courses and acquire hands-on skills with advanced Chemical Engineering equipment. The course has a lecture component which will review major concepts required for the experimental components, in addition to serve as a space for discussion of experimental plans, preparing students for the laboratory component. In the lab, students will carry out experiments, collect, analyze and discuss data. Final presentations for projects will be conducted in the lecture component.

Course Objectives - CHEN 4360 Chemical Engineering Laboratory II:

1. Plan and design experiments based on literature and equipment information. (ABET 7)
2. Anticipate/identify potential equipment failures/hazards and include safety measures prior to the start of experiments. (ABET 4)
3. Carry out experiments safely in a laboratory setting, properly recording information/data. (ABET 4)
4. Work collaborative and in a productive manner with other members of a team. (ABET 5)
5. Apply concepts learned in previous courses to analyze data collected in the laboratory. (ABET 6)
6. Communicate experimental findings and conclusions clearly via well-organized technical written reports and oral presentations. (ABET 3)

The course has a prerequisite, which must be completed successfully (minimum grade "C") prior to taking this course: CHEN 4320, Chemical Engineering Lab I

1. The goal of our faculty is to be commonly available to you for assistance, so you are encouraged and expected to seek **additional instruction (AI)**. Take advantage of AI, it's FREE and really will help! There are several ways you can seek AI:
   - ✓ You are welcome to stop by the instructor's office at any time. However, for your own satisfaction, you can ensure the instructor is available at the office by using the following options:
   - ✓ Come to office hours. This is the time the instructor has set aside to answer your questions;
   - ✓ E-mail or call the instructor to set up a mutually agreeable time to meet with the instructor,
   - ✓ E-mail your questions to the instructor (this is the least preferred option because of the limited effectiveness of e-mail communication), but it is acceptable if other options are not possible.

2. Experiments

Refer to proposed schedule at the end of the syllabus to identify the experiments. Since this is a laboratory course, you will need to take charge of your own learning through observation, questioning, and evaluating answers. Moreover, lab work in this class is open ended. That is, you formulate your experimental plan in addition to executing it. Students will work in teams assigned by the instructor.

3. Procedures:

a. Textbooks: There is no textbook for this course. The instructor will use Canvas to assign Armfield and other readings according to the topics discussed.

b. Lab projects: The class will be divided into teams containing 3-4 members. Successful completion of each project will include the following:
   1. Experimental design oral presentations (pre-lab) which include a thorough literature review, plan of experiments, explanation/justification for the plan, hazard assessment, basis for calculations, interpretation of results, and expected results. The plan will be presented and discussed with the class during the lecture component.
   2. Performance of the laboratory experiments in a professional, safe and clean manner with thorough cleanup after the work is done with appropriate analytical measurements and use those results for calculating relevant quantities that will ultimately affect process performance.
   3. Written final report and oral presentation of experimental findings.

c. Safety: The most important aspect of laboratory work is the safety of all participants. Never begin an experiment unless you are confident you can finish or arrive at a safe end point before the end of the laboratory period. Laboratory coats should be worn to prevent contact with chemical splashes and spills. You must wear safety eye glasses or goggles. Non-prescription safety glasses are available in the lab. Proper protective gloves should be worn whenever the potential for contact with corrosive or toxic materials of unknown toxicity exists. In addition, never wear sandals, shorts, or skirts. Exposure of legs and feet to spilled chemicals is a main cause of chemical burns. No eating, drinking, or smoking or chewing of gum is permitted in the work area. Long hair must be pulled away from work area. Contamination of food, drink, and smoking materials is a potential for exposure to toxic substances.

d. Laboratory sessions: When possible, data should be processed and interpreted during the course of the experimental work, thus helping to identify and correct experimental or data analysis problems. In this regard, any available data-processing computer programs (e.g., spreadsheets) must be run, at least in a preliminary way, during the laboratory session.

4. Evaluations:

a. *ACADEMIC DISHONESTY:* Fabrication/manipulation of data and/or representation of other's work as your own will not be tolerated. Cheating on any graded assignments and the false representation of work will be interpreted as academic dishonesty. Academic dishonesty will be subject to disciplinary action as outlined by the UT Tyler Student Guide on Conduct and Discipline.

b. *Safety project and data studies:* The safety project and data studies will be evaluated separately from the lab presentations and report. They are each to be conducted and turned in individually, even though teamwork is encouraged. The safety project will occur at the beginning of the semester and each student will be in charge of writing a report covering an engineering control present in a lab or industrial setting. The "data study" will consist of a statistics-heavy set of report and presentation, starting from large datasets provided to students. Students will conduct a variety of statistical analyses and tests – separate instruction sheets will be posted on Canvas with specific statistical design questions to each student.

c. *Experimental design oral presentation (pre-lab):* Prior to carrying out experiments in the lab, students will conduct a literature review and orally present a detailed experimental design of the activity to be developed in the labs. This work plan should include clear objectives for your project and must describe the necessary tasks to be carried out, such as calibrations, specific data to be collected during the experimental work, any characterization assays post-test, and a brief description of how the data are to be analyzed. This overall description should make it clear to the reader why you are doing the project as you have planned. The work plan must be well thought out, with specific process parameters to be measured and a specific description of your approach to performing the necessary data collection and analysis (include key equations). It is essential that students know the fundamentals and what needs to be done before going into the laboratory rather than figuring out what to do in the lab or afterwards. *If a pre-lab presentation is not in place as scheduled the lab will be canceled and there will not be a way to make up the points associated with that lab module.*

d. *Updates to the shared lab notebook during rotations:* Only the 1st team in a rotation will present a pre-lab. At the beginning of their rotations, the 2nd and 3rd team must have a discussion session with the prior teams to provide updates to the shared experimental notes. For example, when the 3rd team enters a given experimental rotation (Feb 17th), it is *their* responsibility to gather all info from teams 1 and 2 and use their team color to update the lab notebook. Their experimental success and grades will be evaluated based on such notes.

e. *Final Reports:* After conclusion of the laboratory sections, teams will analyze results and prepare a detailed final report. The lab instructor will evaluate your laboratory reports for technical content and accuracy, as well as overall quality. Reports should discuss *planned work and conditions, along with actual conditions*. Literature cited must include at least four citations in addition to class handouts. The report should be sufficiently clear so that another team could repeat the experiments. A formal final report consists of the following items in order (see separate spec sheet for additional detail):

1 - Cover page, including title, names of team members, and the date.
2 - Table of Contents with page numbers.
3 - Executive Summary or Abstract outlining the equipment, the purpose of the project, how you conducted it, and your primary conclusions and results. This section must stand by itself and not refer to the main body of the report. Symbols should not be used.
4 - Introduction. This section should explain the reasons for doing the work, give some background and your knowledge of the project, and clearly state the key goals and objectives of the assignment.
5 - Experimental Procedures. Outline in detail both the experimental work performed and any data processing techniques employed.
6 - Results. Results should be presented in tables and/or graphs, as appropriate. A brief description on your presentation of results should be included. Each table and graph presented here should be clearly explained in the text, in such a way that the reader should be able to understand their meaning and how they were constructed. Pages of tabulated data do not need to be included if the data have been summarized graphically. Spreadsheets and other extensive listing of original laboratory data and other calculations should be relegated to the appendices.

- If you are the 2nd or 3rd team to run a certain experiment, your results section must incorporate all data (yours and those of previous teams) and be statistically evaluated as an experimental replicate. Any experimental adjustments introduced must be described in your report and presentation.

7 - Discussion of results. The discussion should give a critical appraisal of what you have discovered. Also include comments on the major sources of error and any suggestions for improvements.
8 - Conclusions and Recommendations. A conclusion summarizes to the reader what was accomplished and the findings of the project. This should include recommendations for future trials.
9 - Notation Table. Include symbols and their definitions and units.
10 - References. These should include all pertinent information, for example: Perry, R.H., and Chilton, C.H., eds., Chemical Engineers' Handbook, 6th. ed., McGraw-Hill, New York (1984).
11 - Appendices, should include all sample calculations, complete calculations (including spreadsheets), instrument calibrations (when not needed in the body of the report), and the raw data collected, containing the notes and any info recorded during the shared laboratory work.
12 – A powerpoint presentation mirroring the report content for the last team. The presentation will occur the same day the report is due and should succinctly summarize all reported findings.
13 – Please include writer and editor/reviewer authors in brackets at the end of sections for all reports turned in.
14 – Please include/highlight in the edited report all answers to the questions raised in the oral presentation.

f. *Documentation:* All final reports in this course must be properly documented. Information from the course textbooks (equations and outlines of procedures), class notes, or me is considered immediately available to all students and need not be acknowledged or documented with one exception. **YOU ARE**

REQUIRED TO ACKNOWLEDGE AND DOCUMENT ALL OTHER ASSISTANCE AND REFERENCES USED.

g. *Late Submissions:* It is a basic principle of professionalism that **"Professionals are not Late."** A "CO-ORDINATED LATE" submission occurs when you will miss the due date for a final report and you contact me in advance. Notification immediately before the submission will not suffice. Obviously there are circumstances that will occur and make a timely submission impossible and I will work with you when and if they occur. There will be NO late oral presentations – if one member misses a presentation, the entire team will be penalized getting a zero on the deliverable in question.

h. *Laboratory Performance:* Attendance is required in labs and lectures. Students are expected to be engaged in class and outside of the class. The instructor will assign a laboratory performance grade to each student based on the following factors:
   1) Attendance and punctuality;
   2) Peer evaluations to be conducted at the conclusion of experiments;
   3) Engagement in laboratory recitation sessions, demonstrating initiative to work in teams;
   4) Cleanliness and safety during lab section.

Your grade in this category will reflect the extent to which you have read and understood background material and use it in planning the experiments. Please read the material before coming to class and be prepared to discuss it with the instructor.

5. Grading:

Team members are expected to plan and work together and to contribute equally to each of your assigned tasks. The grade points will be assigned as shown below:

Course Points	
Safety project (1 at 4.0 points)	4%
Pre-lab presentations (2 at 5.0 points each)	10%
Lab notebook updates (4 at 3.0 points each)	12%
Final lab presentations (6 at 4.0 points each)	24%
Written final reports (6 at 7.0 points each)	42%
Data study (1 at 6.0 points each)	6%
Lab Performance, participation, safety and cleanliness (1 at 2.0 points)	2%
Total	100%

Grade Scale based on points	
90 points or higher	A
Between 80 and 90 points	B
Between 60 and 80 points	***C***
Between 40 and 60 points	D
Less than 40 points	F

You need at least 60 points total to pass the course with a C grade. You need to be above the class average to receive an A grade.

6. Assigned readings:

The class schedule will include assigned reading for every lecture. Students who read the corresponding sections of the book *before each class* will certainly make the most of the lectures, so this is highly recommended. In addition, the instructor will periodically post the lecture notes on the course website. Doing the assigned reading prior to class will help you to understand the material presented during the instruction and will fill in gaps for things we do not cover (***I will not cover everything***). It will also make you more familiar with terms and concepts to be covered.

7. **Collection of Student Work:**
   Throughout the semester I will collect student work (best, average, and worst) for the ABET course and outcomes notebooks. This will require me to make a copy of your work, keep your original and return a copy of the graded work to you. I will not draw attention as to what level of work you accomplished.

8. **UT Tyler Honor Code** - Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

9. **Student Responsibilities** - to know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please go to https://uttyler.smartcatalogiq.com/en/2024-2025/catalog/student-success/student-responsibilities/.

10. **Campus Carry** - We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. Information available at https://www.uttyler.edu/about/campus-carry/.

11. **UT Tyler a Tobacco-Free University** - All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling, quitlines, and group support. For more information on cessation programs please visit https://uttyler.policystat.com/policy/token_access/f1ebc54a-b811-42e3-999b-7defc74b2eb7/.

12. **Grade Replacement/Forgiveness and Census Date Policies** - Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at https://www.uttyler.edu/current-students/registrar/. Each semester's Census Date can be found on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract. The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:
    - Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit
    - Receiving 100% refunds for partial withdrawals. (There is no refund after the Census Date)
    - Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
    - Being reinstated or re-enrolled in classes after being dropped for non-payment
    - Completing the process for tuition exemptions or waivers through Financial Aid

13. **State-Mandated Course Drop Policy** - Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

14. **Disability/Accessibility Services** - In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers

accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit https://www.uttyler.edu/academics/success-services/disability-services/ and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with the ADA Coordinator. For more information, including filling out an application for services, please visit the SAR office located in the University Center, # 3150 or call 903.566.7079.

15. **Texas Pregnancy and Parenting Student Laws** - For UT Tyler to comply with Texas Laws SB 412, SB 459, and SB 597/HB 1361, pregnant or parenting students must contact the Parenting Student Liaison at parents@uttyler.edu and complete the Pregnant and Parenting Self-Reporting Form. Faculty with students who have opted into these resources will receive a Maxient email from the Parenting Student Liaison with the appropriate and required accommodations. Accommodations for pregnant and parenting students mirror the SAR accommodations process, and these accommodations are required. Faculty will only provide the accommodations documented by the Parenting Student liaison.

16. **Student Absence for University-Sponsored Events and Activities** - Revised 05/19 If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed. Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class of the semester. For more info, refer to https://uttyler.smartcatalogiq.com/en/2024-2025/catalog/undergraduate-academic-policies/class-attendance-excused-absences/

17. **Social Security and FERPA Statement** - It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

18. **Emergency Exits and Evacuation** - Everyone must exit the buildings when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

19. **Student Standards of Academic Conduct** - Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

i. "Cheating" includes, but is not limited to:

- copying from another student's paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- discussing the contents of an exam with another student who will take the exam;

- collaborating with or seeking aid from another student during a test or other assignment without authority;
- divulging the contents of an exam, for the purpose of preserving questions for use by another, when the instructors has designated that the exam is not to be removed from the exam room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

ii. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit. Plagiarism checks will be conducted on work turned in by students. Copying full documents from a source IS considered scholastic dishonesty, even if such source is cited.

iii. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

iv. All written work that is submitted will be subject to review by plagiarism software.

20. Artificial Intelligence (AI) Language for Syllabi:

UT Tyler is committed to exploring and using generative AI tools as appropriate for the discipline and task undertaken. We encourage discussing generative AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of generative AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any generative AI tool. Additionally, users should be aware that generative AI tools rely on predictive models to generate content that may appear correct but shown sometimes to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit.

In this class, generative AI is permitted only for specific assignments or situations, and appropriate acknowledgment is required. This course has specific assignments where generative AI tools (such as ChatGPT, Copilot or others) are permitted. When AI use is permissible, it will be clearly stated in the assignment directions, and all use of generative AI must be appropriately acknowledged and cited. Using generative AI tools outside of these parameters violates UT Tyler's Honor Code, constitutes plagiarism, and will be treated as such.

21. UT Tyler Resources for Students:

- Writing Center: https://www.uttyler.edu/academics/success-services/writing-center/
- Tutoring Center: https://www.uttyler.edu/academics/success-services/tutoring/
- Counseling Center: https://www.uttyler.edu/student-life/health-wellness/student-counseling-center/

Proposed Schedule – to be updated as needed:

Weeks	Dates	Team I (Red) FJL	Team II (Green) AAGM	Team III (Blue) HIK	Due on Canvas and/or in class
Week 1	**13-Jan**	Syllabus + Lab tour			
	15-Jan	Statistics review			
Week 2	**20-Jan**	Statistics review			
	22-Jan	Statistics review			Lab safety project
Week 3	**27-Jan**	Absorption	Distillation	Batch/CSTR	Pre-labs
	29-Jan	Absorption	Distillation	Batch/CSTR	
Week 4	**3-Feb**	Absorption	Distillation	Batch/CSTR	
	5-Feb	Batch/CSTR	Absorption	Distillation	Update shared notebook
Week 5	**10-Feb**	Batch/CSTR	Absorption	Distillation	
	12-Feb	Batch/CSTR	Absorption	Distillation	
Week 6	**17-Feb**	Distillation	Batch/CSTR	Absorption	Update shared notebook
	19-Feb	Distillation	Batch/CSTR	Absorption	
Week 7	**24-Feb**	Distillation	Batch/CSTR	Absorption	
	26-Feb				Reports and presentations
Week 8	**3-Mar**	Data Study Presentations			Data Studies PPT
	5-Mar	Data Study Presentations			Data Studies PPT
Week 9	**17-Mar**	Cooling tower	Solvent extraction	Corrosion/Fluidized bed	Pre-labs
	19-Mar	Cooling tower	Solvent extraction	Corrosion/Fluidized bed	
Week 10	**24-Mar**	Cooling tower	Solvent extraction	Corrosion/Fluidized bed	
	26-Mar	Corrosion/Fluidized bed	Cooling tower	Solvent extraction	Update shared notebook
Week 11	**31-Mar**	Corrosion/Fluidized bed	Cooling tower	Solvent extraction	
	2-Apr	Corrosion/Fluidized bed	Cooling tower	Solvent extraction	
Week 12	**7-Apr**	Solvent extraction	Corrosion/Fluidized bed	Cooling tower	Update shared notebook
	9-Apr	Solvent extraction	Corrosion/Fluidized bed	Cooling tower	
Week 13	**14-Apr**	Solvent extraction	Corrosion/Fluidized bed	Cooling tower	
	16-Apr	Catch up/retakes/clean up			
Week 14	**21-Apr**	Catch up/retakes/clean up			
	23-Apr				Reports and presentations

Alex:	**Absorption → Notebook 1,**	**Extraction → Notebook 4**
Derick:	**Distillation → Notebook 2,**	**Cooling Tower → Notebook 5**
Lacerda:	**Batch/CSTR → Notebook 3,**	**Corrosion/Fluidized → Notebook 6**