MEMORANDUM FOR STUDENTS ENROLLED IN CHEN 4320 – Section 01
SUBJECT: CHEN 4320 – Chemical Engineering Lab I - Administrative Instructions

Lecture times: M/W, 1:00 – 2:00 pm, RBN 1034

Laboratory times: M/W2:00 – 4:00 pm, RBN 1034

Instructor: Shuhao Liu

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Office hours: MW 9:30 – 11:00 am

Welcome to CHEN 4320 – Chemical Engineering Lab I. This course will provide opportunities for the students to apply scientific and engineering principles learned in lecture courses and acquire hands-on skills with Chemical Engineering equipment. The course has a lecture component which will introduce general and useful statistical techniques for data analysis among engineering and lab research. In addition, discussion of experimental plans, preparation for the laboratory component and presentation practice will be provided in the class. 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 4320 Chemical Engineering Laboratory I:

1. Plan and design experiments based on literature and equipment information.
2. Anticipate/identify potential equipment failures/hazards and include safety measures prior to the start of experiments.
3. Carry out experiments safely in a laboratory setting, properly recording information/data.
4. Work collaborative and in a productive manner with other members of a team.
5. Apply engineering principles and statistical techniques (e.g., regression, confidence intervals, error propagation, and ANOVA, as appropriate) to analyze experimental data, verify theoretical models, and interpret results.
6. Communicate experimental findings clearly and professionally, using appropriate quantitative and statistical analysis to justify conclusions and quantify uncertainty in technical written reports and oral presentations.

The course has prerequisites which must be completed successfully (minimum grade "C") prior to taking this course:

- ✓ MATH 3351, Probability and Statistics for Engineers and Scientists
- ✓ CHEN 3340, Heat Transfer
- ✓ CHEN 3320, Mass Transfer

These course objectives will be used to evaluate the student learning outcome (SO3, SO5, SO6, SO7) for ABET:

ABET SO 3: an ability to communicate effectively with a range of audiences
ABET SO 5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
ABET SO 6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

1. Q&A

Our goal 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 (MW 9:30 – 11:00 am). This is the time the instructor has set aside to answer your questions;
  - E-mail instructor to set up a mutually agreeable time to meet with the instructor,
- ✓ E-mail your questions to the instructor.

2. Projects

The following projects will be available in this course, and each group will carry out all these projects. Description of the equipment will be available in Canvas.

1. Energy loss in bends (fluid mechanics) (1 lab)
2. Gaseous diffusion (mass transfer) (1 lab)
3. Tubular heat exchanger (heat transfer) (2 lab)
4. Centrifugal pumps (fluid mechanics) (2 lab)
5. Cavitation (fluid mechanics) (1 lab)
6. Reynolds experiment (fluid mechanics) (1 lab)
7. Shell-and-tube heat exchanger (heat transfer) (2 lab)
8. Armfield UOP6-MKII Cooling Tower – Heat and Mass Transfer (3 laboratory sessions)
9. Ratliff Relay

The class will be organized into three teams, with approximately 3–4 students in each team. Teams will be assigned by the instructor. Each team will complete all eight laboratory projects according to the course rotation schedule. Because several experiments share common equipment bases, laboratory assignments and schedules must be followed as provided by the instructor and may not be independently exchanged between teams without approval.

Laboratory work in this course is intentionally open-ended. Students are expected to take responsibility for their own learning through observation, questioning, experimental planning, data collection, analysis, and evaluation of results. Before each experiment, teams will develop an experimental plan based on equipment manuals, relevant engineering theory, literature, safety considerations, and the required data-analysis approach.

Ratliff Relays will be treated as a separate course activity and will be described later in this syllabus rather than as one of the eight regular laboratory experiments.

3. Procedures:

- ✓ Textbook:
  1. Jay L. Devore*, Applied Statistics for Engineers and Scientists, 3rd Edition*
- ✓ Reading materials:
  a. The instruction of instrument for the projects (!!!)
  b. Class notes and slides
  c. Instructor's reading notes

- ✓ Reference materials:
  a. Taylor, J.R. *An Introduction to Error Analysis*, 2nd edition. Sausalito: University Science Books (1997).
  b. Yuri A. W. Shardt, *Statistics for Chemical and Process Engineers: A Modern Approach*, 2nd Edition
  c. William Navidi, *Statistics for Engineers and Scientists*, 3rd edition.
  d. Mathematica Documentation: Experimental Data Analyst (wolfram.com)
  e. NIST/SEMATECH e-Handbook of Statistical Methods
- ✓ **Projects: The class will be divided into three groups containing approximately 3–4 members each. Groups will be randomly assigned by the instructor and will remain together for the laboratory projects unless otherwise announced. Each group will complete the assigned laboratory projects according to the course schedule. Successful completion of each project will include the following:**

1. Written Planning Reports: Before conducting each experiment, the group will prepare a written planning report based on the equipment manual, relevant engineering theory, literature, and other appropriate technical information. The planning report should clearly describe the experimental objective and hypothesis, equipment and operating conditions, safety considerations, experimental variables, proposed procedure, expected trends, data-collection plan, and planned data-analysis methods. When appropriate, the analysis plan should identify the statistical techniques that will be used,

such as uncertainty/error propagation, confidence intervals, regression, or ANOVA. Empty raw-data tables should be prepared in advance and included in the planning report so that they can be used during the laboratory session. The report should also identify the responsibilities of each team member for the experiment.

2. Oral presentation of the planning report: The experimental plan will be presented and discussed with the class during the lecture component before the laboratory experiment begins. The presenter may be selected by the instructor to ensure that all group members understand the experiment, equipment, safety requirements, theory, procedure, expected results, and analysis plan.
3. Teamwork and roles: Each team will follow an instructor-issued team charter and use rotating laboratory roles so that students gain experience with different responsibilities during the semester. Roles may include equipment operation, data recording, data verification, calculation, and other experiment-specific responsibilities. Team performance will be evaluated through instructor observation and anonymous peer evaluations, including a mid-semester teamwork checkpoint. (SO5, SO6).
4. Laboratory execution: Students will carry out laboratory experiments in a professional, safe, and clean manner. All team members are expected to participate actively in equipment operation, observation, data collection, and experimental decision-making. The experimental work must follow applicable safety requirements, and the laboratory area and equipment must be cleaned and returned to the appropriate condition after each session.
5. Measurements and data analysis: Students will make appropriate experimental measurements and use the collected data to calculate relevant engineering quantities and evaluate process or equipment performance. Engineering theory and appropriate statistical methods should be used to analyze and interpret the data, compare experimental results with theoretical or expected behavior, quantify uncertainty, and evaluate the quality and limitations of the experimental results.
6. Final reports and presentations: Following completion of the experimental work, each group will analyze the collected data and prepare a final technical report and oral presentation. The final report should include experimental data, appropriate tables and figures, calculations, statistical analysis when required, discussion of results, comparison with theoretical or expected behavior, uncertainty/error analysis, engineering interpretation, conclusions, and recommendations. Raw experimental data and supporting calculation files must be submitted as supplementary materials.

- ✓ Safety: The most important aspect of laboratory work is the safety of all participants. Students are required to complete all required safety training and comply with the safety procedures specified by the instructor. Never begin an experiment unless you are confident that it can be completed or brought to a safe stopping point before the end of the laboratory period. Laboratory coats must be worn when required to protect against chemical splashes

and spills. Appropriate safety glasses or goggles must be worn in the laboratory. Proper protective gloves must be worn whenever there is potential contact with hazardous, corrosive, or unknown materials. Sandals, shorts, and short skirts are not permitted in the laboratory. Eating, drinking, smoking, and chewing gum are prohibited in the laboratory work area. Additional equipment-specific hazards and required PPE must be identified in the planning report and reviewed before beginning each experiment.

- ✓ Laboratory sessions: Whenever possible, experimental data should be processed and interpreted during the laboratory session. Preliminary calculations, plots, and statistical checks should be performed while the experiment is in progress so that potential experimental, measurement, or data-quality problems can be identified and corrected before the experiment is completed. Available data-processing tools, such as spreadsheets or other approved software, should therefore be used during the laboratory session when appropriate.

- ✓ **Each team will use one Laboratory Notebook;** Each team will maintain one laboratory notebook for all experimental work. A photograph or copy of the completed pages should be retained by the team for reference. All raw data, observations, experimental steps, changes or deviations from the planned procedure, equipment settings, unexpected events, preliminary calculations, and rough plots must be recorded directly in the laboratory notebook during the experiment. Entries should be sufficiently clear and complete so that the experimental work can be understood and reconstructed later.

4. Evaluations:

1) *ACADEMIC DISHONESTY:* Representation of other's work as your own will not be tolerated. Cheating on examinations, quizzes, homework, projects, reports 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.

Note: **for this specific lab course: directly copy, paste, and snipping from reading and reference materials (notes, instrumental instruction, website resources, for instance, Google, Wikipedia, artificial intelligence tools are not allowed). Using your own word to explain what you learned is necessary.**

2) *Homeworks:* Homework problems will be assigned following the statistics and data-analysis lectures. There will be approximately four homework assignments during the semester. All homework is mandatory and counts toward your grade. Homework will focus primarily on statistical analysis, uncertainty/error analysis, regression, ANOVA, data interpretation, and other quantitative methods introduced in the lecture component. As an engineer, your goal is to present your work in a clear, logical, organized, and professional manner. Both the accuracy of the final answer and the quality of the solution procedure will be considered in grading. All major

calculation steps must be shown so that the solution can be followed without guesswork. You are encouraged to discuss concepts and problem-solving approaches with classmates; however, the work submitted for grading must be your own. Homework is due at 5:00 pm on the assigned date and must be submitted online through Canvas. **Homework is due at 5:00 pm on the assigned date, and it must be submitted online via Canvas.**

3) *Short In-Class Exams:* Short in-class exams of approximately 10–20 minutes will be administered randomly throughout the semester without prior notice. These assessments are intended to evaluate individual understanding and preparation and may cover recently discussed course material, statistical concepts and calculations, laboratory theory and equipment, safety considerations, data-analysis methods, and material that students are expected to understand from their own pre-lab planning reports and presentations. Students are responsible for understanding the complete experimental plan developed by their team, including the objectives, theory, equipment, procedure, safety requirements, expected trends, data-collection plan, and proposed analysis, regardless of which team member prepared or presented a particular portion. Because these assessments are conducted during the regular class period and are intended to evaluate current individual preparation, make-up assessments will not normally be provided except for approved or unavoidable absences.

4) *Lab attendance and performance*: Students must participate in every experiment project without exception, unless a reasonable request is made in advance. The experiments must adhere to the established rules and safety requirements. After the experiments, students are required to clean their work areas as instructed. They must not disturb others or access areas unrelated to their experiments. At the end of each experiment, students should ensure the laboratory is clean **and submit their lab notebooks** to the instructor for review and signature. Photos should be taken and kept as a reference. Following factors are evaluated:
   a) Attendance and punctuality
   b) Peer evaluations to be conducted at the conclusion of Projects
   c) Engagement in laboratory recitation sessions, demonstrating initiative to work in teams
   d) Cleanness and safety during lab section

5) **Planning Reports (assesses SO6 primary; SO3 and SO5 secondary):** Prior to carrying out each experiment in the laboratory, students will conduct the necessary literature review and prepare a detailed written planning report. The Planning Report should contain the major background information, theory, equipment information, experimental design, and analysis plan needed to demonstrate that the team understands the experiment before beginning laboratory work. The report should be sufficiently detailed that the experimental purpose, scientific and engineering basis, procedure, expected results, and planned analysis can be understood before the experiment is conducted. The Planning Report should include**:**

a) Objectives & hypothesis. Clearly state what the experiment is intended to demonstrate, measure, or evaluate; identify the major research/engineering question and expected outcome or success criteria. (SO6)
b) Background & literature review. Provide sufficient technical background to explain why the experiment is important and how it relates to relevant chemical engineering principles. Include appropriate literature, textbook, equipment manual, and other technical sources. This section should provide the primary background information that will later form the basis of the Introduction section of the Final Report. (SO3, SO6)
c) Mechanism & theory. Explain the governing physical and engineering principles in your own words. Include the major equations, models, correlations, and assumptions needed for the experiment. Define all symbols and units and explain how the theory will be used to interpret the experimental results. (SO3, SO6)
d) Equipment and system description. Identify the major experimental equipment, instruments, components, operating ranges, measurement capabilities, and relevant equipment limitations. When appropriate, include a labeled schematic or diagram of the experimental system. (SO6)
e) Safety & hazards. Identify experiment-specific hazards, required PPE, relevant SDS information, pressure/temperature/electrical/mechanical/chemical risks, waste considerations, emergency actions, and appropriate controls. (SO6)
f) Variables & materials table. Identify independent, dependent, and controlled variables; expected operating ranges; materials used; equipment/instrument identification; and measurement accuracy or uncertainty where available. (SO6)
g) Procedure. Provide a clear numbered experimental procedure, including equipment setup, operating sequence, measurement steps, estimated time required for major steps, shutdown/cleanup procedures, and responsibilities of individual team members. (SO5, SO6)
h) Data plan. Identify the data that will be collected, including units, frequency, replicate measurements when applicable, and file/data-recording methods. Pre-built empty raw-data tables must be prepared and included in the Planning Report for use during the laboratory session. (SO6)
i) Analysis plan. Describe how the collected data will be analyzed. Identify the equations, calculations, plots, statistical techniques, and software that will be used. Statistical methods may include regression, confidence intervals, error/uncertainty propagation, ANOVA, or other methods as specified for the experiment. Include the format of representative or sample calculations when appropriate. (SO6)
j) Expected trends and results. Predict the expected experimental behavior based on theory and literature. Appropriate sketches, expected plots, ranges, or qualitative trends should be included and justified. (SO6)
k) Team roles & timeline. Provide a simple role chart identifying the responsibilities of each team member during the experiment and the expected sequence/timeline of major tasks. (SO5)
l) References: the resources used in the whole material with scientific citations.

Presentation of plan: Each team will provide an 8–10-minute planning presentation, followed by approximately 2 minutes for questions and discussion. The presentation will be conducted before

the laboratory experiment begins and may be used to evaluate individual understanding of the experiment. (SO3, SO5, SO6)

Submission order: The planning presentation will be completed first, followed by the laboratory experiment. The written Planning Report must be uploaded through Canvas on the same day as the planning presentation unless otherwise specified.

6) *Final Reports:*
   a) **Length/format:** The Final Report should normally contain 8–12 pages in the main body, using 1.5 spacing and 12-point font. SI units should be used unless otherwise appropriate. All figures and tables must be numbered and include descriptive captions. Unless otherwise posted, the Final Report and Final Presentation will normally be due approximately two weeks after the final experimental session for the corresponding project.
   b) Relationship between the Planning Report and Final Report: The Planning Report serves as the foundation for the Final Report. Students are not required to independently rewrite background material that was already developed appropriately in the Planning Report. In particular, the Introduction section of the Final Report may be carried forward directly from the Planning Report. However, students are required to revise the Introduction based on instructor comments and feedback provided on the Planning Report and to update the material when the actual experiment, assumptions, operating conditions, literature interpretation, or understanding of the system differs from the original plan. Simply resubmitting the Planning Report Introduction without addressing instructor feedback will not satisfy the Final Report requirement.
   c) After completion of the laboratory work, teams will analyze the collected data and prepare a detailed Final Report. The Final Report should clearly distinguish between what was originally planned and what was actually performed. The instructor will evaluate the report for technical accuracy, quality of experimental analysis, appropriate use of statistical methods, engineering judgment, organization, and clarity of communication. The report should be sufficiently complete that another engineering student could understand the experiment, analysis, and conclusions. A formal final report consists of the following items in order:
      i) Cover page — title, names of group members, experiment/project identification, and date. Include the Honor Code on this page.
      ii) Abstract (125–175 words) — briefly identify the equipment/system, experimental purpose, major methods, principal quantitative results, and major conclusions. The abstract should stand alone and should not refer the reader to other sections of the report.
      iii) Introduction — include the background, literature context, engineering motivation, experimental objectives, major theory, and relevant assumptions developed in the

Planning Report. **The Planning Report Introduction may be used as the starting point for this section; however, all instructor comments must be addressed and the content must be revised as appropriate based on the completed experiment.** The Final Report Introduction should represent the team's final and corrected understanding of the experiment rather than simply reproduce an uncorrected earlier submission.

iv) Experimental Procedures — describe the actual experimental procedure used. The procedure may be based on the Planning Report, but it must be revised to reflect what was actually performed. Clearly identify any deviations from the original plan and explain why the changes were necessary. Include relevant calibration, equipment settings, operating conditions, and quality-control procedures.

v) Notation Table — list symbols, definitions, and SI units used throughout the report. Symbols should be consistent with equations, figures, tables, and calculations.

vi) Results — present the experimental results using appropriate tables, figures, graphs, and calculated quantities. Unless otherwise specified, include at least two appropriate figures and two tables. Each figure/table must have a descriptive caption and should be discussed in the text. Report replicate measurements, measurement uncertainty, and required statistical analyses when applicable.

vii) Discussion of Results — critically analyze and interpret the experimental findings. Compare experimental results with theoretical predictions, expected trends, literature values, or appropriate models. Include required statistical and uncertainty analysis, such as error propagation, confidence intervals, regression diagnostics, residual analysis, ANOVA, or other specified methods. Discuss data quality, experimental limitations, sources of uncertainty/error, and whether the results support the original hypothesis or expected behavior. Engineering judgment must be used when evaluating the significance and reasonableness of the results.

viii) Conclusions and Recommendations — summarize the major quantitative and qualitative findings and clearly state whether the experimental objectives were achieved. Conclusions must be supported by the experimental results and analysis.

ix) References — include at least four appropriate technical references in addition to class handouts or lecture materials unless otherwise specified. References should follow a consistent professional citation style such as ACS, APA, or IEEE.

x) Acknowledgment and Team Contributions — acknowledge relevant assistance and resources and provide a statement describing each team member's major responsibilities and approximate contribution to the experiment, analysis, report preparation, and presentation.

7) *Lab notes:* The lab notes should be submitted after each experimental session. Clear writing are necessary and should be readable and repeatable by others. The time of each step and what observed at each step needs to be records.

8) Ratliff Relays: Students enrolled in CHEN 4320 will participate in the College of Engineering Ratliff Relays as a separate team-based course activity. Students will work in teams of approximately 3–4 members and will be expected to contribute actively to the planning, preparation, construction/testing activities, technical communication, and teamwork required by the competition. Each team will designate a team captain and will follow the official Ratliff Relays requirements and schedule provided for Fall 2026. The specific competition problem, required technical deliverables, presentation/poster requirements, testing procedures, evaluation criteria, and deadlines will be provided in a separate Ratliff Relays document when the official competition instructions are available.

9) **Late Submissions.** It is a basic principle of professionalism that **"Professionals are not Late."** A "COORDINATED LATE" submission occurs when you will miss the due date for a graded assignment and you contact me in advance. Notification immediately before the submission will not suffice. Point cuts up to the amounts below **may** be assessed for a "COORDINATED LATE" submission:
   1. 0-24 hours late — a deduction of 25% of the earned grade
   2. 24-48 hours late — a deduction of 50% of the earned grade
   3. More than 48 hours late — No credit.

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 reports.

5. Grading

- The written laboratory reports (planning/final) are group reports. Group members are expected to plan and work together and to contribute equally to each of your assigned Tasks.
- The oral presentation of each Planning Report will be used to evaluate individual preparation and understanding. One team member will be selected randomly by the instructor to present the experimental plan. The selected student is expected to understand the entire project, including the objectives, theory, equipment, safety, experimental procedure, expected trends, data collection, and planned analysis, not only the portion that the student personally prepared. Each student will be selected to present at least once during the semester and may be selected more than once.
- The oral presentation of each Final Report is a group presentation. All group members are required to participate in the presentation.
- Planning presentations and Planning Reports will be due on the same day as the first experimental session for the corresponding project. The planning presentation will be completed before the laboratory experiment begins. Final presentations and Final Reports

will also be due on the same scheduled date, normally approximately two weeks after the last experimental session for that project unless otherwise stated in the course schedule.

- Short in-class exams of approximately 10–20 minutes will be administered randomly throughout the semester. These exams are individual assessments and may include statistical concepts and calculations, course material, equipment and experimental theory, safety, data analysis, and material students are expected to understand from their own Planning Reports.

The course points will be assigned as shown below:

Course Component	**Points**
Short In-Class Exams	10
Homework	10
Oral Planning Reports	8
Written Planning Reports	16
Oral Final Reports	16
Written Final Reports	24
Lab Performance, Participation, Safety, Cleanliness, and Teamwork	6
Ratliff Relays	10
Total	**100**

Grade	**Course Points**
A	88.00–100
B	70.00–87.99
C	60.00–69.99
D	50.00–59.99
F	Below 50.00

6. Artificial Intelligence Usage in This Course

Generative artificial intelligence (AI) tools, such as ChatGPT, Microsoft Copilot, Gemini, and similar tools, may be used in this course only as a supplementary learning and editing resource. Permitted uses are limited to idea discussion, clarification of concepts, brainstorming, and optimization of student-created work, such as improving organization, clarity, grammar, or presentation.

Generative AI may not be used to complete homework assignments or during in-class examinations or other individual assessments.

For laboratory reports, presentations, and other course projects, students must first develop their own technical content, analysis, interpretation, and conclusions. AI may then be used to discuss ideas or suggest ways to improve material that the student or team has already developed. AI

may not be used to directly generate the report, presentation, slides, experimental analysis, calculations, conclusions, or other graded technical content.

The following requirements apply:

- No AI use for homework or in-class exams. Generative AI tools may not be used to solve, check, rewrite, or otherwise assist with homework assignments or short in-class examinations unless explicitly authorized by the instructor.
- No direct generation of reports or presentations. Students may not ask generative AI to write an entire report, report section, presentation, slide deck, discussion, conclusion, or other graded course deliverable.
- No direct copy-and-paste. AI-generated text, calculations, figures, tables, or other content may not be copied and pasted directly into submitted work. Students must develop and express the final content themselves.
- Permitted idea discussion. Students may use AI to discuss possible approaches, ask conceptual questions, brainstorm experimental or analytical ideas, or explore alternative ways of thinking about an engineering problem. Students remain responsible for deciding whether any suggestion is technically appropriate.
- Permitted optimization of student-created work. After students have developed their own content, AI may be used to suggest improvements in grammar, clarity, organization, wording, or presentation. AI should function as an editing or feedback tool rather than as the author of the work.
- Technical responsibility. Students are responsible for understanding and verifying all technical information included in submitted work. AI-generated information may be inaccurate, incomplete, or misleading and must be checked against appropriate sources such as textbooks, equipment manuals, peer-reviewed literature, standards, or instructor-provided materials.
- Experimental data and analysis. AI may not fabricate, alter, replace, or invent experimental data, laboratory observations, instrument readings, calculations, or results. Students are responsible for performing and understanding the engineering and statistical analysis presented in their work.
- Full documentation of AI use. If generative AI is used for an assignment, the complete interaction with the AI tool, including all student prompts and all AI responses, must be exported and submitted as supplementary material with the assignment. Partial screenshots or selected portions of the conversation are not sufficient when a complete export is available.
- Acknowledgment. Students must clearly acknowledge the use of generative AI and briefly describe how it was used, for example, “Generative AI was used to discuss organization of the Results section and to suggest grammatical improvements to student-written text.”
- Student accountability. Students must be able to explain and defend all material included in their reports and presentations. Inability to explain submitted technical content may be considered evidence that the work does not appropriately represent the student's or team's own understanding.

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. 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.

9. **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.

10. **Students Rights and Responsibilities:** to know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: http://www.uttyler.edu/wellness/rightsresponsibilities.php.

11. **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. More information is available at http://www.uttyler.edu/about/campus-carry/index.php.

12. **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 www.uttyler.edu/tobacco-free.

13. **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 http://www.uttyler.edu/registrar. Each semester's Census Date can be found on the Contract itself, 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 for these 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

14. **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.

15. **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://hood.accessiblelearning.com/UTTyler 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 Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at http://www.uttyler.edu/disabilityservices, the SAR office located in the University Center, # 3150 or call 903.566.7079.

16. **Student Absence due to Religious Observance** - 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 meeting of the semester.

17. **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.

18. **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.

19. **Emergency Exits and Evacuation** - Everyone is required to exit the building 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.

20. **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 test 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 specifically 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;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination;
- divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination 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 offered for credit;
- 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, including 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.
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.

21. UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)

Schedule:
1 = Energy Loss in Bends
2 = Gaseous Diffusion
3 = Tubular Heat Exchanger
4 = Centrifugal Pump
5 = Cavitation
6 = Reynolds Experiment
7 = Shell-and-Tube Heat Exchanger
8 = Armfield UOP6-MKII Cooling Tower

P: Plan report and presentation due
E: Experiments
F: Final report and presentation due

Week	Date	Day	Team A	Team B	Team C	Course / Notes
1	Aug 24	M				Course material
1	Aug 26	W				Course material
2	Aug 31	M				Course material
2	Sep 2	W				Course material
3	Sep 7	M				**No Class — Labor Day**
3	**Sep 9**	W	**1 P+E**	**3 P+E1**	**2 P+E**	Experimental Session 1
4	**Sep 14**	M	**2 P+E**	**3 E2**	**1 P+E**	Experimental Session 2
4	Sep 16	W				Course material / Statistics
5	**Sep 21**	M	**3 P+E1**	**1 P+E**	**4 P+E1**	Experimental Session 3
5	**Sep 23**	W	**3 E2 + 1 F**	**2 P+E**	**4 E2 + 2 F**	Experimental Session 4
6	**Sep 28**	M	**2 F**	**3 F**	**1 F**	**Instructor Lab 8 Cooling Tower material**
6	**Sep 30**	W	**4 P+E1**	**8 P+E1**	**3 P+E1**	Experimental Session 5
7	Oct 5	M		**1 F**		Course material / report presentations
7	**Oct 7**	W	**4 E2**	**8 E2**	**3 E2**	**E-only session — Statistics**
8	**Oct 12**	M	**5 P+E**	**8 E3**	**6 P+E**	Experimental Session 7
8	**Oct 14**	W	**3 F**	**2 F**	**4 F**	Final reports/presentations / course material
9	**Oct 19**	M	**7 P+E1**	**4 P+E1**	**8 P+E1**	Experimental Session 8
9	**Oct 21**	W	**7 E2 + 4 F**	**4 E2**	**8 E2 + 3 F**	Experimental Session 9
10	**Oct 26**	M	**6 P+E + 5 F**	**7 P+E1 + 8 F**	**8 E3**	Experimental Session 10
10	**Oct 28**	W	**8 P+E1**	**7 E2**	**5 P+E + 6 F**	Experimental Session 11
11	**Nov 2**	M	**8 E2**	**5 P+E**	**7 P+E1**	Experimental Session 12
11	**Nov 4**	W	**7 F**	**4 F**		Final presentations / course material

Week	Date	Day	Team A	Team B	Team C	Course / Notes
12	Nov 9	M				**No regular class**
12	Nov 11	W				**No regular class**
13	**Nov 16**	M	**8 E2 + 6 F**	**5 P+E + 7 F**	**7 P+E1**	Experimental Session 12
13	**Nov 18**	W	**8 E3**	**6 P+E + 7 F**	**7 E2 + 5 F**	Experimental Session 13
14	Nov 23	M				**No Class — Thanksgiving**
14	Nov 25	W				**No Class — Thanksgiving**
15	**Nov 30**	M		**5 F**		Final presentation / course material
15	**Dec 2**	W	**8 F**	**6 F**	**7 F**	Final experimental presentations / course wrap-up

This is a tentative syllabus. It is within my discretion to change aspects of this syllabus as needed.