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

Lecture times: T/Th, 1:00 – 2:00 pm, RBN 1034

Laboratory times: T/Th 2:00 – 3:30 pm, RBN 1034

Instructor: Shuhao Liu

E-mail: SLIU@uttyler.edu

Teaching Assistant: Nadim Mahmud nmahmud@patriots.uttyler.edu

Office hours: MW 11:30 – 1:00 pm

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 concepts learned in previous courses to analyze data collected in the laboratory.
6. Communicate experimental findings and conclusions clearly via well-organized 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
ABET SO 7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

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 1:30 – 3:00 pm). 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. Ratliff Relays: CO2 Bottle Rocket (2 lab)

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 of three or four as randomly assigned by the course instructor.

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 groups containing 3-4 members. Each group will be assigned particular projects for the semester. Successful completion of each project will include the following:**

  Written Planning Reports: Your written planning reports should include a detailed literature review, a plan for the experiments, and an explanation or justification for the plan. Note: It's a good idea to leave some empty space and tables in these reports. These empty areas can be used for data collection later and will be helpful when you're working on your final reports. Additionally, you can use these empty spaces to outline your expectations for the data and your future analysis plans. (SO3, SO6, SO7).

  a. Oral presentation of the reports: The plan will be presented and discussed with the class during the lecture component. (SO3, SO5).
  b. Carry out the laboratory experiments in a professional, safe and clean manner with thorough cleanup after the work is done. (SO5, SO6).
  c. Make appropriate analytical measurements and use those results for calculating relevant quantities that will ultimately affect process performance. (SO6 [primary], SO7).
  d. Finalize your reports with data collection, data plot, data analysis, discussion, and conclusion (raw data are needed as a supplementary document). (assesses SO3, SO6, SO7).

- ✓ Safety: The most important aspect of laboratory work is the safety of all participants. To keep this goal, you are required to take safety training and comply with all guidelines as specific by the instructor. 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, goggles or reading glasses with tempered lenses and side shields. 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 short 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. Contamination of food, drink, and smoking materials is a potential for exposure to toxic substances.

- ✓ 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.

- ✓ **Each team will use one Laboratory Notebook;** The Lab notes needed to be signed by instructor/TA after each lab section. A photocopy of the lab note is required for reference. Attach a copy of the report on the lab note with an empty table that was prepared. All data, observations, steps in the procedure, alterations in procedure, comments, calculations done during the laboratory session, and rough plots are to be entered in your lab notebook.

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 courses: 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:* A set of homework problems will be assigned after the statistics lecture (there will be **four homework** assignments during the semester). All homework is mandatory and becomes part of your grade. As an engineer, your goal is to make a clear, logical, and professional presentation of your work, which is both accurate and correct. As such, both the presentation and the accuracy of your work are important, and both will be graded. It is critical that you show all of your work and leave "footprints" so that it can be easily followed. No guesswork should be required to see what you did. For each homework problem, the corresponding topic and numerical answers will be provided. You are encouraged to work in groups, but the work that you turn in should be your own. **Homework is due at 5:00 pm on the assigned date, and it must be submitted online via Canvas.**

3) *Lab attendance and performance*: Students must participate in every experiment project without exceptions, 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 cleanliness of the laboratory **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

4) **Special project and presentation (assesses SO7; secondary SO3).**
   Each student will be assigned a special project by the instructor. Topics will connect to statistics, experimental design, and the lecture/lab themes. This assignment requires you to acquire and apply new knowledge beyond class materials—e.g., learning a new statistical method, software feature (Excel/JMP/Python/R), or experimental-design tool—and to use it appropriately in an engineering context (SO7).
      a. What you will do: Independent study & information search (SO7): Read beyond the textbook, locate high-quality sources (peer-reviewed articles, standards, application notes), and learn any needed analysis tools.
      b. Present your findings (SO3 secondary): Give a concise talk with slides that also serve as your final report.
      c. Deliverables:

i. 1-page topic brief (≤300 words, due per Canvas): question/hypothesis, chosen method, why it's appropriate, and planned data/source. (SO7 evidence: method justification + source plan)
ii. Slide deck (10–12 slides) = final report: background; method overview; dataset & assumptions; calculations/outputs (figures/tables); interpretation; limitations; recommendations. Include at least 2 sources (≥1 peer-reviewed). (SO7 evidence: correct application + citation of new knowledge)
iii. New-Knowledge Log (appendix): bullet list of what you learned, where you learned it, and how you validated it (e.g., reproducing an example, comparing two sources). (SO7)
iv. Oral presentation: 8–10 minutes + 2 minutes Q&A. (SO3 secondary)

d. Examples of suitable topics
i. Uncertainty & error propagation for a lab instrument calibration; confidence intervals for slope/intercept.
ii. ANOVA for comparing replicate runs; checking model assumptions.
iii. ……..More

5) **Planning Reports** ***(assesses SO6 primary; SO7, SO3 secondary):*** Prior to carrying out experiments in the lab, students will conduct a literature review and turn in a detailed experimental design written report of the activity to be developed in the labs. This work plan should include:
a) Objectives & hypothesis. What you will demonstrate/estimate; success criteria. (SO6)
b) Safety & hazards. Specific hazards, PPE, SDS refs, waste, emergency actions. Identify energy/pressure/chemical risks and your controls. (SO6)
c) Mechanism & theory (in your own words). Key equations with units and symbols defined. (SO7)
d) Variables & materials table. Independent/dependent/controlled variables, expected ranges; equipment list with IDs and accuracies. (SO6)
e) Calibration/QA plan. What gets calibrated, how, and acceptance limits. (SO6)
f) Procedure with timings (separate page). Numbered steps, estimated time per step, who does what. (SO6)
g) Data plan. What you will record (units/frequency), pre-built empty tables for raw data (separate page), and file naming. (SO6)
h) Analysis plan. Which methods (regression, confidence intervals, error propagation, ANOVA if specified), software, and a sample calculation format? (SO6, SO7)
i) Expected trends. Sketch or bullet what you anticipate and why. (SO7)
j) Team roles & timeline. Simple role chart for the run. (SO5)
Presentation of plan: 8–10 min + 2 min Q&A with slides (counts toward SO3).
Submission order: present first; upload the written plan the same day of your talk.

6) *Final Reports:*
a) **Length/format:** 8–12 pages main body, 1.5 spacing, 12-pt font; SI units; numbered figures/tables with captions. **Due:** one and half week after your last run unless otherwise posted.
b) After the 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 both planned and actual work conditions. Literature cited must

include at least four citations in addition to class handouts. The trial report should be sufficiently clear so that another group could repeat the experiments. A formal final report consists of the following items in order:

(1) Cover page — title, names of group members, date. Include the honor code on this page. (SO3)
(2) Abstract (125–175 words) — equipment, purpose, how you conducted the work, primary conclusions and results. The abstract must stand alone (no references to the main body; avoid symbols unless paired with the term). (SO3)
(3) Notation Table — symbols with definitions and SI units. Keep consistent with what appears in equations/figures. (SO3)
(4) Introduction — motivation and background from literature; clearly state goals/objectives and what success looks like (criteria). Include the planned operating window and key assumptions. (SO3, SO7)
(5) Experimental Procedures — detailed steps and any special data-processing techniques. Explicitly note deviations from the plan and why. Include calibration steps and acceptance criteria. (SO6)
(6) Results — tables/graphs (min. 2 of each). For each figure/table, provide a descriptive caption and explain in text so the reader understands the meaning and construction. Report number of replicates (n) and measurement uncertainty. Note: for specified projects, required statistical analyses must be included (see course schedule). (SO6)
(7) Discussion of Results — critical appraisal of findings; compare to expectations and literature. Include error/uncertainty analysis (e.g., propagation, confidence intervals), regression diagnostics (R^2, residuals), and engineering judgment about data quality and limitations. (SO6)
(8) Conclusions and Recommendations — summarize what was accomplished and key findings; link back to objectives/success criteria; propose specific improvements for future trials. (SO6, SO7)
(9) References — ≥4 beyond class handouts; consistent style (ACS/APA/IEEE) with DOIs/URLs where applicable. (SO7, SO3)
(10) Acknowledgement — resources or assistance from others; include a contributions/peer-evaluation statement noting each member's tasks and approximate effort. (SO5, SO3)
(11) Appendices — sample and full calculations (including spreadsheets or code), instrument calibrations (if not in the body), and original laboratory notebook pages (scans) containing notes and raw data. Provide raw data files (CSV/Excel) sufficient for reproduction. (SO6, SO7)

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: All the students in the College of Engineering will participate in a "hands-on" project, which will consist of a group competition in late October. As part of the activities of this course, CHEN 4320 students will participate in a "CO2 Bottle Rocket" competition (competing against groups of Chem Eng juniors and seniors). The purpose of this competition is two-fold: (1) to provide students the opportunity to wrestle with an open-ended, practical engineering problem, and (2) to increase awareness of STEM Challenges across the state of Texas. The competition focuses on four distinct aspects: (1) creating an innovative solution to a wastewater treatment problem, (2) authoring a technical report describing the project management, design, engineering, and construction of the treatment solution, (3) delivering a poster relaying technical and management information regarding the project, and (4) physically testing the solution and displaying the elements to be judged. The bulk of the activities that form the competition are analogues of the real-world skills that practicing engineers and project managers in the new millennium must possess. Student teams will

consist of 3 or 4 students, who will be responsible for answering questions during the Oral Presentation. Each team shall designate a registered participant as their team captain. Additional details about the Ratliff Relays will be made available in a separate document.

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.

10) All planning, final reports and specific projects in this course must be properly documented. You are required to acknowledge, document, and cite all references and assistance received from others (excluding the instructor). Documentation should follow the guidelines of a recognized writing manual, including proper use of footnotes or endnotes. For team projects, contributions from different members must be clearly attributed in the relevant sections to the respective contributors.

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 planning reports will be conducted individually **(random pick in the class)** to evaluate how much you know the project.
- The presentation of final reports are group work and each member are required to present partial of it.
- **The presentations for both the planning and final reports will take place on the same day as the report submissions, in the classroom before the lecture.**
- The presentation of the specific project will be conducted individually.

The course points will be assigned as shown below:

Course Points	**Total**
Specific project (PowerPoint and presentation)	10
Homework	8
Oral planning reports (Each at least once presentation)	10
Written planning reports	15
Oral final reports (PowerPoint)	15
Written final reports	25
Lab Performance, participation, safety and cleanliness	7
Ratliff Raleys	10
	Total 100 (100%)

Grade Scale based on points	
A	88~100
B	70~88
C	60~69
D	50~59
F	<50

6. Artificial Intelligence Usage in This Course

Generative AI tools (such as ChatGPT or Copilot) are permitted only for specific assignments or situations, and appropriate acknowledgment is required. This course includes open-ended projects where the use of generative artificial intelligence (AI) tools is permitted. When AI use is allowed, it will be clearly stated in the assignment directions, and all uses of generative AI must be properly acknowledged and cited.

Copying and pasting from AI-generated content or using AI to generate entire reports, presentations, or slides is strictly prohibited. Generative AI tools are to be used only as a supplementary resource to help you quickly understand new concepts that may be involved in your open-ended topics. It is important to cross-check AI-generated information with other reliable sources, as AI can sometimes produce incorrect or misleading information.

Unless stated otherwise, the default is that use of generative AI is not allowed for homework, pre-lab/post-lab reports, and pre-lab/post-lab presentations.

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 (1) · 2 = Gaseous diffusion (1) · 3 = Tubular heat exchanger (2) · 4 = Centrifugal pumps (2) · 5 = Cavitation (1) · 6 = Reynolds (1) · 7 = Shell-and-tube heat exchanger (2)

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

week	Date			Team A		Team B		Team C		Course material
1	Aug	26	T							Syllabus, Introduction
1	Aug	28	Th							Preparing technical memos, lab notebooks, and lab safety
2	Sep	2	T							Lab report writing lecture & **Statistical Lecture**
2	Sep	4	Th							Ratliff Relays Discussion - Group Assignments
3	Sep	9	T	1 P+E		3 P+E		4 P+E		
3	Sep	11	Th	5 P+E		3 E		4 E		
4	Sep	16	T							**Statistical Lecture**
4	Sep	18	Th							**Statistical Lecture**
5	Sep	23	T	2 P+E	1 F	1 P+E		7 P+E		
5	Sep	25	Th	4 P+E	5 F	5 P+E	3 F	7 E	4 F	
6	Sep	30	T							**Statistical Lecture**
6	Oct	2	Th							**Statistical Lecture**
7	Oct	7	T	4 E	2 F	7 P+E	1 F	1 P+E		
7	Oct	9	Th			7 E	5 F	5 P+E	7 F	
8	Oct	14	T							Lab 1, 4, 5
8	Oct	16	Th							Lab 2, 6
9	Oct	21	T	3 P+E	4 F	6 P+E		2 P+E	1 F	
9	Oct	23	Th	3 E		4 P+E	7 F	6 P+E	6 F	
10	Oct	28	T							**Statistical Lecture**
10	Oct	30	Th							**Statistical Lecture**
11	Nov	4	T							**Statistical Lecture**
11	Nov	6	Th	7 P+E		4 E	6 F		2 F	
12	Nov	11	T	7 E	3 F	2 P+E			6 F	Lab 3, 7
12	Nov	13	Th							**Statistical Lecture**
13	Nov	18	T	6 P+E				3 P+E		
13	Nov	20	Th					3 E		
14	Nov	25	T							Thanksgiving
14	Nov	27	Th							Thanksgiving
15	Dec	2	T		7 F		4 F			OEP presentations
15	Dec	4	Th		6 F		2 F		3 F	OEP presentations
16	Dec	9	T							
16	Dec	11	Th							

PJ 1: Loss in Bend **(statistical analysis are required in final report)**
PJ 2: Gas diffusion
PJ 3: Tubular Heat Ex **(statistical analysis are required in final report)**
PJ 4: Centrifuge pump **(statistical analysis are required in final report)**
PJ 5: Cavitation
PJ 6: Renold **(statistical analysis are required in final report)**
PJ 7: Shell and tube Heat exchanger **(statistical analysis are required in final report)**

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