Prairie View A&M University
Chemical Engineering Department
CHEG 3023-P01: Unit Operations
Fall 2019 Syllabus

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Office Hours: M 9:30 – 12:30 p.m. (or by appointment)

COURSE

Meeting Time: TH 5:00 –6:20 PM

Location: Gilchrist 104

Prerequisites: CHEG 2053 with minimum grades of C

Required Text: Unit Operations of Chemical Engineers. 7th Edition, McCabe, Smith and Harriott, McGraw-Hill, 2005, ISBN: 0-07-284823-5

References: Fluid Mechanics for Chemical Engineers. 3rd edition, N. de Nevers, McGraw-Hill, 2005, ISBN: 978-0-07-256608-6

Evaluation: This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course. The course has been designed to ensure that students acquire a solid grounding in ABET Outcomes 2 and 7.

Description: Fluid statics and its applications, fluid flow phenomena, basic equations of flow, hydraulic losses, incompressible flow in pipes and channels, flow of compressible fluids, flow past immersed objects, transportation and metering of fluids, Heat exchangers.

Goals: The goal of this course is to prepare the students in the following:

1. An ability to apply engineering design to produce solutions.
2. An ability to Identify and list the design objectives and constraints
3. An ability to define the design requirements, strategy and methodology
4. Report information regarding unit operations in chemical engineering.
5. Perform research analysis on chemical engineering unit operations.
6. Design and analyze equipment utilized in unit operations in chemical engineering.

GRADING POLICY

Items	Weight %
2 Projects	15 %
Final Project and Presentation	15%
2 Tests	30 %
Quiz/Class Participation/Assignments	15 %
Final	25 %

Grade Scale: A = 100 - 90
B = 89 - 80
C = 79 - 65
D = 64 - 50
F = 49 or below

TESTS & TESTING POLICY

- Tests will occur in class and will consist of closed and open book portions.
- NO MAKE-UP EXAMS WILL BE GIVEN. A missed exam due to an excusable absence will not be added into the students Test Average; therefore, only three tests will count for that student. Only the hardcopy edition of the text may be used on open book exams. NO EXCEPTIONS!
- No electronic device will be allowed including iPads and eReaders.
- No graphing calculators are allowed for any test or quiz. Students must purchase a small scientific calculator to use on exams. A cell phone cannot be use as a replacement for a graphing calculator on an exam.
- No bathroom breaks are allowed during a test or a quiz. If a student leaves the room during this time, their exam/quiz will be collected and considered finished by the student.
- Any sightings of a cellular phone during an exam or a quiz will automatically result in a grade of zero for that student, and the student will be referred to the department head. Such meetings must take place within a week of the violation.

QUIZZES

- Quizzes will be given throughout the semester. Quizzes will be based on material covered in class and project assignments.

ASSIGNMENT POLICY & GUIDELINES

- Practice problems have been provided for students on the tentative lecture schedule. These problems are for your independent practice and not for weekly submission.

• Specific assignments will be given throughout the semester as the instructor examines the specific need of the class.

• These assignments may be computer based or involve the textbook.

• Students must submit these assignments during a given time frame. **NO late submission.**

• If a student chooses to disobey the university's honor code and copy the solution manual instead of submitting the student's own independent work, the student will receive a grade of zero on the assignment and will be referred to the department head. Such meetings must take place within a week of the infraction.

• All homework assignments must be submitted on engineering paper.

• Write only on the front of the paper.

• **Staple assignment if it is more than one page**.

• Write your name, date, and assignment number on the front page.

• Number your pages! From time-to-time, students staple the pages out of order.

• Homework is due at the beginning of the class period. **Late homework assignments will NOT be accepted!**

CLASS ACTIVITIES AND PARTICIPATION GRADES

- Class activities will often occur each week.
- **No late or replacement assignments will be accepted**.
- These activities may be computer based or involve the textbook.
- Students must submit these assignments during a given time frame.
- Cellular phones must remain turned off at all times during the class. Laptop use is prohibited in class. No exceptions, zero tolerance. **Penalty of up to 10 points for using electronics in class**.

PROJECT

- projects will be discussed as class continues and due dates will be assigned for each project.
- The final project will be discussed during midterm of the semester and report and presentation will be due at the end of the semester.
- The projects will cover various fluid flow and heat transfer processes and the units associated with them.

- The projects will require a technical report that discusses the results of the assignment. Students should not print insignificant tables and graphs to simply add pages to the report. Assignments should be completed by group of students and submitted in class and online.

BOOK POLICY

• The textbook for this course is REQUIRED. Students without textbooks will eventually fail the course; therefore, all students without a hard copy (or special cases) of the textbook will be dropped from the course on the 7th class day based on the policy of the College of Engineering.

• Books can be purchased through the bookstore or online.

FINAL EXAM PROCEDURES

• The comprehensive final exam will have a closed book and open book section.

• All students are required to take the final exam. No exemptions are given.

• It is the student's responsibility to arrive on time for the exam with all of the needed materials.

TENTATIVE LECTURE SCHEDULE Fall 2017

Week	Lecture Topic	No. of lectures	Grading
1	Chapter 1: Definitions and Principles	2	
2	Chapter 2: Fluid Statics and Its Applications Labor day holiday 9/2 GENERAL ASSEMBLY: 9/11	2	
3	Chapter 3: Fluid Flow Phenomena	2	
4	Chapter 4: Basic Equations of Fluid Flow	2	
5	Chapter 4: Basic Equations of Fluid Flow	2	
6	Chapter 5: Incompressible Flow in Pipes and Channels	2	
7	Chapter 5: Incompressible Flow in Pipes and Channels	1	Exam 1 10/10
8	Chapter 6: Compressible Flow	2	
9	Chapter 7: Flow Past Immersed Objects	2	

10	Chapter 7: Flow Past Immersed Objects Chapter 8: Transportation and metering of fluids	2	
11	Chapter 8: Transportation and metering of fluids	2	
12	Chapter 11: Principles of Heat flow in fluids	1	Exam 2 11/14
13	Chapter 11: Principles of Heat flow in fluids PROJECT DUE: 11/15 Presentation Thanksgiving Holiday Nov	2	
14	Presentation	2	
15	Review for Final December 3, 2019	1	
	Final Exam Period: Date will be posted soon		

UNIVERSITY RULES AND PROCEDURES

Disability statement (See Student Handbook)

Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook)

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.

2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.

3. Fabrication: use of invented information or falsified research.

4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook)

Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy

Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog.

COURSE OUTCOMES

Two major course outcomes will be assessed in this course using a number of performance criteria. The Course outcomes and their performance criteria are detailed below:

STUDENT OUTCOME 6 : an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

Demonstrate ability to perform quantitative physical measurements, operate, laboratory scale equipment.

(i) Ability to Understand unit operation problems as turbulent or laminar.

(ii) Ability to classify unit operation problems as static or dynamic.

(iii) Ability to conduct experiments related to unit operation as measuring flow, pressure, temperature.

(iv) Ability to carefully record experimental data .

(v) Ability to analyze collected experimental data and represent them in the form of table and figures

(vi) Ability to demonstrate the problems faced and suggestions for best solution.

STUDENT OUTCOME 7: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Recognition of the need for, and an ability to engage in life-long learning

1. Ability to report information regarding unit operations in chemical engineering.

Given a problem, the student is able to:

(i) Ability to prepare a written report of based on research analysis.

(ii) Ability to present research analysis clearly.

(iii) Ability to present research analysis results thoroughly to a group within a time frame.

2. Ability to perform research analysis on chemical engineering unit operations.

Given a problem, the student is able to:

(i) Ability to use search engines and databases.

(ii) Ability to use journal articles and book to gather information.

(iii) Ability to conduct interviews to gather information.

(iv) Ability to use multiple source types to gather information.

(v) Ability to utilize the library for resources.

3. Ability to design and analyze equipment utilized in unit operations of chemical engineering.

Given a problem, the student is able to: (i) Analyze and design manometers. (ii) Analyze and design pumps, compressors, and valves. (iii) Analyze and design pipes and fittings.