Tuskegee University
College of Engineering
Department of Chemical Engineering

Spring 2024

Course: CENG 0490, Senior Design Project
Hours: Wednesday 02:00 PM - 05:00 PM
Location: Luther H. Foster Hall, Room 528
Coordinator: Shahryar Jafarinejad, PhD
Email: sjafarinejad@tuskegee.edu
Office: Luther H. Foster Hall, Room 522B
Phone: 334-724-4318
Office Hours: Tuesday 01:00 PM - 02:00 PM; Wednesday 11:00 AM - 01:00 PM; others by appointment
Credit Hours: 3.0
Prerequisites: CENG 0470
Textbook: None

Course Objectives:
Students will
Objective1. Conduct a comprehensive literature survey on a chemical process.
Objective2. Design a complete chemical process and perform economic analysis of the process.
Objective3. Develop oral and written communication skills.
Objective4. Function on a team.

Course level student learning outcomes:

Outcomes	1	2	3	4	5	6	7
Objective1							X
Objective2	X	X					
Objective3			X	X			
Objective4					X		

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
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

6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

General Policies:

- Attendance is important for successful completion of this course.
- **No late project is accepted.**
- Brief typewritten progress reports are submitted to the instructor every week, and short presentations on weekly progress reports are given to the class.
- The final oral presentations will be scheduled for the week before the final semester examination period.
- A typewritten final report should be ready for the week before the final semester examination period.
- Weekly progress reports as well as a final report should be written with a PC-computer word processor.
- Medical reasons with WRITTEN PROOF.
- In the event of an excused absence, make up assignments must be done by the next class meeting following the date of the excused absence (unless scheduled with the instructor). The student is responsible for his/her own missed assignments.
- Effective Spring 2012, the tuskegee.edu email system at Tuskegee University is required for all instructional administrators, faculty, staff and students.
- Effective Spring 2012, all instructional administrators, faculty, staff and students are required to use CANVAS and Navigate (EAB).
- Academic dishonesty policies outlined in the undergraduate handbook will be strictly enforced.

Grading Criteria:

Category	Percentage (%)
Weekly progress reports/oral presentations	40
Final report	40
Final oral presentation	20

Final Grading Scale:

Percentage (%)	Letter Grade
90-100	A
80-89	B
70-79	C
60-69	D
0-59	F

Progress and Final Reports (40%):

Category	Percentage (%)
Content	5
Summary	5

Introduction	5
Theory	5
Hazard control and analysis	10
Results	10
Discussion	10
Conclusion	5
References	5
Design calculations	40

References

1) M.S. Peters, K.D. Timmerhaus, R.E. West, Plant Design and Economics for Chemical Engineers, Fifth Edition, McGraw-Hill.

2) Seider, Seader and Lewin, Process Design Principles, John Wiley & Sons, Inc., New York, NY 1999.

3) R. Turton, R. Bailie, W. Whiting, and A. Shaeiwitz, analysis, Synthesis, and Design of Chemical Processes, Prentice Hall, upper Sadlle River, NJ., 1998.

4) Perry and Chilton, Chemical Engineer's Handbook, Sixth Edition, McGraw-Hill Book Company, New York.

5) McCabe and Smith, Unit Operations of Chemical Engineering, Third Edition, McGraw-Hill Book Company, New York.

6) Gael D. Ulrich, A Guide to Chemical Engineering Process Design and Economics, John Wiley & Sons, N. Y.

7) Joseph E. Shigley, Mechanical Engineering Design, Second Edition, McGraw-Hill Book Company, New York.

8) H. Carl Bauman, Fundamentals of Cost Engineering in the Chemical Industry, Reinhold Publishing Corporation, N. Y.

9) Thomas K. Sherwood, A Course in Process Design, The M.I.T. Process, Cambridge, Mass., 1963.

10) Aerstin and Street, Applied Chemical Process Design. Plenum Press, New York.

11) Kenneth M. Guthrie, Process Plan Estimating Evaluation and Control, Craftsman Book Company of America, Solona Beach, California.

12) Flow of Fluids Through Valves, Fittings and Pipes, Crane Corp, New York.

13) M. W. Martin, and R. Schinzinger, Ethics in Engineering, 2nd Edition, McGraw Hill, New York, 1989.

14) Donald E. Garrett, Chemical Engineering Economics, Van Nostrand Reinhold, New York, 1989.

15) William D. Baasel, Prepliminary Chemical Engineering Plant Design, Van Nostrand Reinhold, New York, Second Edition, 1990.

16) S. Jafarinejad, Petroleum Waste Treatment and Pollution Control, 1st Edition, Butterworth-Heinemann, Elsevier, 2016.

17) N. Nevers, Air Pollution Control Engineering, The McGraw-Hill Companies, Inc., 2000.

18) K.B. Schnelle, C.A. Brown, Air Pollution Control Technology Handbook, CRC Press LLC, 2002.

19) L.K. Wang, N.C. Pereira, Y.T. Hung, Advanced Air and Noise Pollution Control, Humana Press Inc., 2005.

Chemical Engineering Department
Tuskegee University

Oral Presentation Evaluation

Second semester 2023-2024

Your Name:_____

Course Number: CENG 490_____ Date:

Name of student	Organization	Subject Knowledge	Graphics	Mechanics	Eye Contact	Elocution	Total Score

	Evaluating Student Presentations			
	1	**2**	**3**	**4**
Organization	Audience cannot understand presentation because there is no sequence of information.	Audience has difficulty following presentation because student jumps around.	Student presents information in logical sequence which audience can follow.	Student presents information in logical, interesting sequence which audience can follow.
Subject Knowledge	Student does not have grasp of information; student cannot answer questions about subject.	Student is uncomfortable with information and is able to answer only rudimentary questions.	Student is at ease with expected answers to all questions, but fails to elaborate.	Student demonstrates full knowledge (more than required) by answering all class questions with explanations and elaboration.
Graphics	Student uses superfluous graphics or no graphics	Student occasionally uses graphics that rarely support text and presentation.	Student's graphics relate to text and presentation.	Student's graphics explain and reinforce screen text and presentation.
Mechanics	Student's presentation has four or more spelling errors and/or grammatical errors.	Presentation has three misspellings and/or grammatical errors.	Presentation has no more than two misspellings and/or grammatical errors.	Presentation has no misspellings or grammatical errors.
Eye Contact	Student reads all of report with no eye contact.	Student occasionally uses eye contact, but still reads most of report.	Student maintains eye contact most of the time but frequently returns to notes.	Student maintains eye contact with audience, seldom returning to notes.
Elocution	Student mumbles, incorrectly pronounces terms, and speaks too quietly for students in the back of class to hear.	Student's voice is low. Student incorrectly pronounces terms. Audience members have difficulty hearing presentation.	Student's voice is clear. Student pronounces most words correctly. Most audience members can hear presentation.	Student uses a clear voice and correct, precise pronunciation of terms so that all audience members can hear presentation.

Covid-Statement

Excuses related to covid infection as well as exposure have to be received from the Dean of Students office. Students should request the excuse for absence from the Dean of Students office as soon as they become aware of covid infection or exposure. Students may request a classes missed memo by contacting the Office of the Dean of Students and Student Conduct (334) 727-8421, via e-mail tharper@tuskegee.edu or by going into the office located in suite 203 Tompkins Hall.