

**Tuskegee University
College of Engineering
Department of Chemical Engineering**



Spring 2026

Course: CENG 0490, Senior Design Project

Hours: Wednesday 02:00 PM - 5:00 PM

Location: Luther H. Foster Hall, Room 528

Coordinator: Iman Hassani, PhD

Email: ihassani@tuskegee.edu

Office: Luther H. Foster Hall, Room 522A

Phone: 334-727-8845

Office Hours: Mondays and Wednesdays from 10:00 AM to 2:00 PM, Fridays from 10:00 AM to 12:00 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
Objective 1							x
Objective 2	x	x					
Objective 3			x	x			
Objective 4					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 the successful completion of this course. Students are expected to attend all scheduled classes. A student who arrives in class after the beginning of class will be considered absent but may still attend the remainder of the class. The attendance grade will be based on the percentage of classes present (or excused).
- At least one member of the group is required to arrive in the classroom early to log into the computer and have the group presentation ready before the instructor arrives.
- **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 two weeks before the final semester examination period.
- A typewritten final report should be ready two weeks before the final semester examination period.
- Weekly progress reports and a final report should be written with a PC-computer word processor.
- Medical reasons with WRITTEN PROOF.
- 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.
- 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 Saddle 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) Ayrin 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, Solana 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, Preliminary 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 2024-2025

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.