CHEG 4248-P02 & P82: Senior Design and Professionalism II
Spring 2024 Syllabus

Information Item	Information
Instructor:	Dr. Kazeem Olanrewaju
Section # and CRN:	P02 CRN 23476; P82 CRN 23477
Office Location:	C.L. Wilson 201 C
Office Phone:	936-261-9968
Email Address:	kaolanrewaju@pvamu.edu; olakab@gmail.com
Office Hours:	MF: 10:00 a.m. – 2:00 p.m. (Virtual/Face-to-face)
Mode of Instruction:	Lecture
Course Location:	New Electrical Engr Bldg 115 (T) and Gilchrist Engr. Bldg 109 (R)
Class Days & Times:	T R 3:30 – 4:50 p.m.
Catalog Description:	**(0-3) Credit 2 semester hours.** This is the second course of a two-semester capstone experience (CHEG 4248 must immediately follow 4247 or sequence must restart with 4247) involving engineering design of an industrial or advanced team project. Elements of ethics and professionalism in engineering practice are integrated into the project experience. The project will include application of relevant engineering codes and standards, as well as realistic constraints. Design achievements are demonstrated with written reports, and oral presentation, and professional standards and ethics examinations..
Prerequisites:	CHEG 3301 and CHEG 3302 and CHEG 3304 and CHEG 3306; CHEG 4247
Co-requisites:	CHEG 4248-P02; CHEG 4248-P82
Required Text(s):	None

Recommended Text(s):	1. "Chemical Process Engineering: Design & Economics," by Harry Silla, 2003, Marcel Dekker, ISBN 0-8247-4274-5. 2. "Analysis, synthesis and Design of Chemical Processes" by Richard Turton, Richard C. Bailie, Wallace B. Whitting, Joseph A. Schaeiwitz and Debangsu Bhattacharrya, 4th Edition, 2012, Prentice Hall, ISBN-13: 9780132618120 3. "Plant Design and Economics for Chemical Engineers" by Peters, M.S., K.D. Timmerhaus and R.E. West, 5th edition, 2003, McGraw-Hill, ISBN 0—07-2392665. "Fundamentals of Engineering Design", by Barry Hyman, 2nd edition, 2003, Pearson Education, Inc. (Prentice Hall), ISBN 0-13-046712-X 4. "Chemical Engineering Process Design and Economics: A practical Guide" by Gael D. Ulrich and Palligarnai T. Vasudevan, 2nd Edition, 2004, Process(Ulrich) Publishing, ISBN0-9708768-2-3 5. "Bioprocess Engineering Principles", by Pauline M. Doran, 2nd edition, 2013, Academic Press, ISBN 978-0-12-220851-5 6. "Senior Project Manual" by Prairie View A & M University College of Engineering

General Course Information Table

Access to Learning Resources: PVAMU phone: (936) 261-	Library: 1500; web: http://www.tamu.edu/pvamu/library/
University Bookstore: phone:	(936) 261-1990; web: https://www.bkstr.com/Home/10001-10734-1?demoKey=d

Course Goals or Overview:

The goal of this course is to provide a capstone design experience for chemical engineering students who have completed all of their design coursework at the junior level and below.

Course Outcomes/Objectives

At the end of this course, the student will have achieved and demonstrated the following outcomes.

1 Be able to design a system, component, or process to meet desired needs.
2 Demonstrate an understanding of professional and ethical responsibility.
3 Be able to demonstrate the broad education necessary to understand the impact of engineering solutions in a global and societal context.
4 Be able to recognize the need for and ability to engage in life-long learning.
5 Demonstrate a knowledge of contemporary issues

Course Requirements & Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course. Continuous assessment of students' homework assignments, oral presentations and written design reports will be used to evaluate their competence in ABET student outcomes 2 (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), and 5 (ability to (i) function effectively on a team whose members together (ii) provide leadership, create a collaborative and inclusive environment, (iii) establish goals, plan tasks, and meet objectives).

Presentation – oral presentations, some of which are graded, to develop and demonstrate an ability to communicate effectively in oral mode.

Homework Exercises – written assignments, often in letter report format, designed to supplement and reinforce course material. The letter report format serves to develop and demonstrate an ability to communicate effectively in written mode.
Quizzes – announced or surprise in-class assignments to promote student accountability **Project** Report – the central feature of this course is an open ended design project on a relevant, contemporary, technical problem in the student's discipline. The report is the medium by which design accomplishments are demonstrated and also serves to develop and demonstrate an ability to communicate effectively in written mode.
Class Participation – daily attendance and participation in class discussions

Grading Matrix *(points will vary according to instructor's grading system)*

Instrument	**Total**
Homework Assignments	5%
Midterm progress report	5%
Final presentation	70%
Final project report	20%
Total	**100%**
Discount for lack of participation	-10%
Extra credit (as assigned by instructor)	

Grade Determination:

A = 100 – 90pts;
B = 89 – 80pts;
C = 70 – 79pts;
D = 60 – 69pts;
F = 59pts or below

Students can expect feedback and grading of assignments and exams within 1 to 3 weeks, unless otherwise noted.

Course Procedures

Textbook Policy

Students must acquire the textbook that is listed as "required" on the course syllabus. The textbook must be acquired by the 10th class day. Students are not allowed to share textbooks with other students who are currently registered in the same class. Failure to acquire (or show proof of purchase) the required textbook by the 10th class day will result in the student being administratively dropped from the course. The University will assess financial obligations for the course to the student as with any other dropped class according to the fee schedule. In addition, your financial aid may be affected by the subsequent registration action(s).
Go to http://www.pvamu.edu/pages/195.asp for the Roy G. Perry College of Engineering Textbook Policy.

Conduct:

1. Students will conduct themselves in a manner that is respectful to their fellow classmates and the instructor at all times.
2. **Cell phones, ipads and smart phones or similar electronic devices MUST** be turned off and stowed away during class time. Students are **NOT** allowed to leave class to answer cell phones or use these devices.
3. Students caught using ipads and smart phones or similar electronic devices during exams will receive **ZERO** for the exam and be subject to sanctions as stipulated under **Academic Misconduct**.
4. Students should be prepared to stay in the classroom for the duration of the exam. Students who have any condition that may require them to leave the exam room should make prior arrangements with the Instructor. Students who decide to leave the exam room for any other reason must handover their exam paper and consider the exam over for them.
5. Programmable calculators are **NOT** allowed in class.

6. Students should dress professionally and are **NOT** allowed to wear caps/hats in class.
7. Students are NOT allowed to bring food to the classroom or eat in class
8. Arrive to class prepared to discuss lesson with your project binder.

Submission of Assignments:

There will be project assignments, reports and presentations. All presentations will be team presentations and each student is required to contribute to the success of the team. It is recommended that a member of the group be assigned the duty of recorder, and maintain the minutes of meetings (with listing of attendees) and a notebook with pertinent information. Individual reports are to be submitted at mid term and at the end of the semester detailing the contribution of each team member. A team report is to be submitted at midterm and a final report is to be submitted at the end of the semester. In the event that it becomes necessary to remove a member from a team, the following procedure must be followed:

- The team minus the affected member, must meet to discuss the action to be taken.
- The team must then meet with the affected student and discuss the action to be taken.
- A letter must be submitted to the instructor giving justification for the action to be taken. The letter must be signed by all team members and a copy must be sent to the affected student.
- The instructor will then schedule a meeting with the team members and the affected student for final discussion and appropriate action.

All homework assignments are due directly to the Instructor, prior to the start of class or the assignment will not be accepted. All homework assignments and exams should be written on one side of the page only, and should use the appropriate cover sheet, with the name, assignment title and date. All pages should be numbered. Failure to use the correct cover sheet will result in the assignment grade being reduced by 20%. **Formatting Documents:** Microsoft Word is the standard word processing tool used at PVAMU. If you're using other word processors, be sure to use the "save as" tool and save the document in either the Microsoft Word, Rich-Text, or plain text format.

Exam Policy

Exams should be taken as scheduled. No makeup examinations will be allowed except under documented emergencies (See Student Handbook).

Professional Organizations and Journals

As directed by instructor.

References

As directed by instructor.

16 WEEK CALENDAR

Semester Calendar

Hybrid CHEG 4248 Course Schedule

Modules	Topic	Assignment/Activity (Online)	Assignment/Activity (Face-to-Face[F2F])	Due Date
Start Here/ Course Introduction Module 1:	Introduction to Senior Design and Professionalism II		• Course overview & Manual: Meeting Agreement; • Review of group dynamics • Reading: Group Dynamics	[No Due Date]

Module 2: F2F Meeting (Tues) Online (Thurs)	Project Task Distribution and GANT Chart Development	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Project constraints, tasks and GANTT chart	
Module 3: F2F Meeting (Tues) Online (Thurs)	Material and Energy Balance Review and Update	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Finalized Material/Energy balances and updated literature review	
Module 4: F2F Meeting (Tues) Online (Thurs)	Process Design, Simulation and Safety	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Process design: Process simulation using HYSYS/ASPEN and Safety Review; • Hazards, operability and inherent safety (HAZOP analysis)	
Module 5: F2F Meeting (Tues) Online (Thurs)	Major Equipment Design and Safety Analysis	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Design of major equipment, codes and standards and HAZOP analysis • Reading: Design equations and heuristics, codes and	
Module 6: F2F Meeting (Tues) Online (Thurs)	Major Equipment Design and Safety Analysis	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Review of design of major equipment, HAZOP analysis	
Module 7: F2F Meeting (Tues) Online (Thurs)	Major Equipment Design	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Lecture and review of design of major equipment • Reading: Codes and standards	

Module 8: F2F Meeting (Tues) Online (Thurs)	Major Equipment Design	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Lecture and review of major equipment design • Reading: Codes and standards	
Module 9:	SPRING BREAK			
Module 10: F2F Meeting (Tues) Online (Thurs)	Material Selection for Equipment Design	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Review of Process Design and analysis: Materials selection • Reading: Materials selection	
Module 11: F2F Meeting (Tues) Online (Thurs)	Material Selection for Equipment Design and Plant Layout	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Review of Process Design and analysis: Equipment specification • Reading: Chemical engineering design and Plant layout	
Module 12: F2F Meeting (Tues) Online(Thurs)	Process Design Analysis, Control (Instrumentation) and Safety	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Review of Process Design and analysis: Process control; final safety review and HAZOP analysis • Reading: Process control and instrumentation	
Module 13: F2F Meeting (Tues) Online (Thurs)	Process Design and Economic Analysis	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Review of Process Design and analysis: Economic Evaluation • Reading: Capital costs, operating costs and return on investment	
Module 14: F2F Meeting (Tues) Online (Thurs)	Process Design and Economic Analysis	• Online Presentation (Industrial Partner, Instructor, Faculty)	• Review of Process Design and Analysis: Outline of project presentation • Completion of detailed plant design • Dry-run Preliminary Presentation to Final Presentation • Final Presentation;	

			•	
Module 15: F2F Meeting (Tues) Online (Thurs)		•	•	
Final Exam: [May 06- May 13]				[TBD]

Week One: Topic — Course overview & Manual: Meeting Agreement; Review of group dynamics
Chapter (s):
Assignment (s): Reading: Group dynamics

Week Two: Topic — Project constraints, tasks and GANTT chart
Chapter (s):
Assignment (s): Homework 1: Group dynamics and GANTT chart

Week Three: Topic — Finalized Material/Energy balances and updated literature review
Chapter (s):
Assignment (s): Homework 2

Week Four: Topic — Process design: Process simulation using HYSYS/ASPEN and Safety Review; Hazards, operability and inherent safety (HAZOP analysis)
Chapter (s):
Assignment (s): Homework 3

Week Five: Topic — Design of major equipment, codes and standards and HAZOP analysis
Chapter (s):
Assignment (s): Reading: Design equations and heuristics, codes and standards

Week Six: Topic — Design of major equipment, HAZOP analysis
Chapter (s):
Assignment (s): Homework 4

Week Seven: Topic — Design of major equipment
Chapter (s):
Assignment (s): Reading: Codes and standards

Week Eight: Topic Design of major equipment
Chapter (s):
Assignment (s): **Mid Term**

Week Nine: Topic
Chapter (s):
Assignment (s): **Spring Break**

Week Ten: Topic Process Design and analysis: Materials selection
Chapter (s):
Assignment (s): Reading: Materials selection

Week Eleven: Topic Process Design and analysis: Equipment specification
Chapter (s):
Assignment (s): Reading: Mechanical engineering design and Plant layout

Week Twelve: Topic Process Design and analysis: Process control; final safety review and HAZOP analysis
Chapter (s):
Assignment (s): Reading: Process control and instrumentation

Week Thirteen: Topic Process Design and analysis: Economic Evaluation
Chapter (s):
Assignment (s): Capital costs, operating costs and return on investment

Week Fourteen: Topic Process Design and Analysis: Outline of project presentation
Chapter (s):
Assignment (s): Completion of detailed plant design

Week Fifteen: Topic Course Review
Chapter (s):
Assignment (s): Final draft of project report due

Week Sixteen **Final Presentation; Final Report due**

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 and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Technical Considerations for Online and Web-Assist Courses

Minimum Hardware and Software Requirements:
-Pentium with Windows XP or PowerMac with OS 9
-56K modem or network access
-Internet provider with SLIP or PPP
-8X or greater CD-ROM
-64MB RAM
-Hard drive with 40MB available space
-15" monitor, 800x600, color or 16 bit

-Sound card w/speakers
-Microphone and recording software
-Keyboard & mouse
-Netscape Communicator ver. 4.61 or Microsoft Internet Explorer ver. 5.0 /plug-ins -
Participants should have a basic proficiency of the following computer skills:

- ·Sending and receiving email
- ·A working knowledge of the Internet
- ·Proficiency in Microsoft Word
- ·Proficiency in the Acrobat PDF Reader
- ·Basic knowledge of Windows or Mac O.S.

Netiquette (online etiquette): students are expected to participate in all discussions and virtual classroom chats when directed to do so. Students are to be respectful and courteous to others in the discussions. Foul or abusive language will not be tolerated. When referring to information from books, websites or articles, please use APA standards to reference sources.

Technical Support: Students should call the Prairie View A&M University Helpdesk at 936-261-2525 for technical issues with accessing your online course. The helpdesk is available 24 hours a day/7 days a week. For other technical questions regarding your online course, call the Office of Distance Learning at 936-261-3290 or 936-261-3282

Communication Expectations and Standards:
All emails or discussion postings will receive a response from the instructor within 48 hours.

You can send email anytime that is convenient to you, but I check my email messages continuously during the day throughout the work-week (Monday through Friday). I will respond to email messages during the work-week by the close of business (5:00 pm) on the day following ***my receipt*** of them. Emails that I receive on Friday will be responded to by the close of business on the following Monday.

Submission of Assignments:
Assignments, Papers, Exercises, and Projects will distributed and submitted through your online course. Directions for accessing your online course will be provided. Additional assistance can be obtained from the Office of Distance Learning.

Discussion Requirement:
Because this is an online course, there will be no required face to face meetings on campus. However, we will participate in conversations about the readings, lectures, materials, and other aspects of the course in a true seminar fashion. We will accomplish this by use of the discussion board.

Students are required to log-on to the course website often to participate in discussion. It is strongly advised that you check the discussion area daily to keep abreast of discussions. When a topic is posted, everyone is required to participate. The exact use of discussion will be determined by the instructor.

It is strongly suggested that students type their discussion postings in a word processing application and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, it should be copied and pasted to the discussion board.

Video Conferencing Etiquette

When using Zoom, WebEx or other video conferencing tools, confirm the visible area is tidy, clear of background clutter, inappropriate or offensive posters, and other distractions. Ensure you dress appropriately and avoid using high traffic or noisy areas. Stay muted when you are not speaking and avoid eating/drinking during session. Before class session begins, test audio, video and lighting to alleviate technology issues. **Technical Support**

Students should go to the Password Reset Tool if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Center for Instructional Innovation and Technology Services (CIITS) at 936-261-3283 or email ciits@pvamu.edu.

Communication Expectations and Standards

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can take place in a seminar fashion. This will be accomplished by the use of the discussion board. The exact use of discussion will be determined by the instructor.

It is strongly suggested that students type their discussion postings in a word processing application such as Word and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-andgrammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, copy and paste to the discussion board.

COVID-19 Campus Safety Measures

To promote public safety and protect students, faculty, and staff during the COVID-19 pandemic, Prairie View A&M University has adopted policies and practices for the Fall 2020 academic term to limit virus transmission. Students must observe the following practices while participating in face-to-face courses and course-related activities (office hours, help sessions, transitioning to and between classes, study spaces, academic services, etc.):

- **Self-monitoring** - Students should follow CDC recommendations for self-monitoring. Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely and should not participate in face-to-face instruction.

- **Face Coverings** - Face coverings (cloth face covering, surgical mask, etc.) must be properly worn in all non-private spaces including classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource and support offices, and outdoor spaces where 6 feet of physical distancing is difficult to reliably maintain.

- **Physical Distancing** - Physical distancing must be maintained between students, instructors, and others in course and course-related activities.

- **Classroom Ingress/Egress** - Students must follow marked pathways for entering and exiting classrooms and other teaching spaces. Students should leave classrooms promptly after course activities have concluded, should not congregate in hallways and should maintain 6-foot physical distancing when waiting to enter classrooms and other instructional spaces.

- **Face-to-face Class** - To attend a face-to-face class, students must wear a face covering (or a face shield if they have an exemption letter). If a student refuses to wear a face covering, the instructor should ask the student to leave and join the class remotely. If the student does not leave the class, the faculty member should report that student to the Office for Student Conduct for adjudication. Additionally, the faculty member may choose to teach that day's class remotely for all students.

- **COVID-19 Guidelines for Student Conduct Adjudication** - The mandatory COVID-19 Training/Certification taken by all students serves as the 1st Warning for violation of COVID-19 Guidelines.

    - 1st incident: upon review of Incident Report and finding of responsibility — Conduct Probation

    - 2nd incident: upon review of Incident Report and finding of responsibility — Suspension

    - Consult the Code of Student Conduct in the Student Planner or Student Conduct website for additional information on Conduct Probation and Suspension.

- **Personal Illness and Quarantine** - Students required to quarantine must participate in courses and course-related activities remotely and must not attend face-to-face course activities. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities. Students experiencing personal injury or illness that is too severe for the student to attend class qualify for an excused absence. To receive an excused absence, students must provide appropriate documentation to the Office for Student Conduct, studentconduct@pvamu.edu.