Fall 2018

CHE 626 - Mathematical Methods in Chemical Engineering

Ezinwa Elele

Recommended Citation

COURSE OUTLINE
ChE 626: Mathematical Methods in Chemical Engineering
Fall 2018

Instructor: Dr. Ezinwa Elele

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Time & Place of Class: Wednesday, 6:00 pm – 9:05 pm, CULM LECT 3

Office hours: Tuesday, 3:00 p.m. – 4:00 p.m. or individual appointment, Tier 387

Course Prerequisites: MATH 222 or equivalent undergraduate degree in Chemical Engineering

Course Description: The purpose of the course is to emphasize the importance of mathematics to chemical engineering practice.

Textbook: No textbook is required.
However, materials that discusses solutions to differential equation and their applications in Chemical Engineering will be helpful in the class (e.g. Applied Mathematical Methods for Chemical Engineers by Norman W. Loney)

Course Objectives:
- Understand differential equations and how they model different physical and chemical processes
- Solve differentials equations using a variety of methods
- Analyze and interpret solutions to differential equations
- Work in teams to model and provide solutions to engineering problems

Grading schemes:

Category	Score
In-class group activities	10%
Homework and Quizzes	15%
Project	10%
Midterm	30%
Final Exam	35%

Weighted final score (%)	Letter Grade
90-100	A
85-89.9	B+
80-84.9	B
75-79.9	C+
70-74.9	C
<70	F

In-class group activities:
You will be assigned to work in teams and complete many in-class activities with your team. The performance of your team is part of your course grade.

Homework:
- Homework assignments will be uploaded on Moodle. Typically, it will mirror and extend the problems treated in the classroom to test understanding of concepts.
- Please write legibly and organize your homework so that it will be easy to understand and grade. You may also chose to type your work.
- A late homework will not be accepted and no extension will be granted unless there is a legitimate excuse. A homework is considered late if received later after the deadline.
- Quizzes will be given in class throughout the semester. Students who do their assigned homework and actively participate in in-class activities will have no problems passing the quizzes.

Exam:
Exams will test materials treated in class and problems will range in difficulty from easy to challenging. The exam will be cumulative and will be taken during a class period. There will be no make-up exam for students who miss an exam unless there is a legitimate excuse.

Project:
Project will be posted in Moodle and will be discussed in class.

Courtesy Reminders:
- Attendance is important. There is a high correlation between failure and poor class attendance
- There will be no eating, drinking, use of cell phone, cameras or laptops in the class unless you are permitted by the instructor.
- All class assignments are expected to be submitted timely.
- In this course, each voice in the classroom has something of value to contribute. You are expected to behave professionally and show respect to fellow students and the instructor. Exhibit a conduct that is attributable to a professional engineer.

Academic Integrity:
The NJIT Honor Code and standards of *academic integrity* will be enforced in this course. Any violation will be brought to the immediate attention of the Dean of Students. All students are encouraged to look over the University Code on Academic Integrity and understand this document. Students are expected to uphold the integrity of this institution by reporting any violation of academic integrity to the Office of the Dean of Students.

Student with disabilities:
NJIT is committed to providing students with documented disabilities equal access to programs and activities. If you have, or believe that you may have, a physical, medical, psychological, or learning disability that may require accommodations, please contact Student Disability Services. Information on the self-identification, documentation and accommodation process can be found on the webpage at: http://www.njit.edu/counseling/services/disabilities.php.

Schedule:

#	Date	Topic
1	Sept 5	Differential Equations – Basic Concepts
2	Sept 12	Separable First-Order Differential Equations Linear First-Order Differential Equations Exact First-Order Differential Equations
3	Sept 19	Applications of First-Order Differential Equations
4	Sept 26	Second-Order Linear Homogeneous Differential Equations with Constant Coefficients The Method of Undetermined Coefficients
5	Oct 3	Method of Variation of Parameters Systems of Differential Equation
6	Oct 10	Laplace Transforms to Solve Linear Differential Equations
7	Oct 17	Applications of Second-Order Linear Differential Equations Numerical Methods for Ordinary Differential Equations
8	Oct 24	*Midterm Examination*
9	Oct 31	Boundary Value Problems; Sturm-Liouville Problems
10	Nov 7	Fourier Series and Integrals
11	Nov 14	Partial Differential Equations and Method of Separation of Variables *Project Assignment*
12	Nov 21	No Class - Thursday Classes Meet
13	Nov 28	Partial Differential Equations and Method of Separation of Variables Numerical Methods for Partial Differential Equations
14	Dec 5	Laplace Transforms to Solve Partial Differential Equations *Project Assignment Due*
15	Dec 12	Applications of Partial Differential Equations
		Final Exam: TBA