

CE 526 Engineering Mathematical Methods 29741R (4 units)

VHE 214 MW 12-1:50PM
29709R 2025 Spring Semester — Course Syllabus

Professor	Vincent Lee, vlee@usc.edu		
Office	KAP 230B and OHE 200		
Phone	(213) 740-0568		
Web Site	https://www.brightspacehelp.usc.edu/ (was Blackboard)		
Office Hours	TBA		
Teaching Assistant	TBD		
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COURSE DESCRIPTION			
Engineering Mathematical Methods for solutions of problems encountered in civil, mechanical and aerospace engineering			
COURSE OBJECTIVES			
Engineering problems discussed on a physical basis with solutions via mathematical tools: Fourier series; Fourier and Laplace transforms; partial differential equations, wave and Laplace equations. Duplicates credit in CE 525b. Recommended preparation: undergraduate multivariable calculus and ordinary differential equations.			
LEARNING OBJECTIVES			
After reviewing what we learned in our undergraduate Math/Calculus courses, we learn Fourier series, eigenvalues & functions, systems of ODE. Then we spent almost 2 months on PDE, when we solve the wave, heat and Laplace equations in both rectangular and polar coordinates. We then discuss transform methods in the last month.			
Prerequisite	none		
Days, Time, Location	Monday	3:30 – 6:10 p.m.	RTH105
Required Textbook	E. Kreyszig Advanced Engineering Mathematics 10 th ed. ISBN-13: 978-0470458365		
Required Course	Master of Science in Civil Engineering – Structural & other options --- see CEE catalogue		
Grading Schema	Homework	10	%
	All Exams	90	%
	Total	100	%

CE 526 Engineering Mathematical Methods —Class Schedule

DATE		Lecture	Topics	Homework
Week	WED	No.		Posted on Blackboard Due Wed Next Wk
1	Jan13	1	L00 - Review - PreQuiz	
	Jan15	2	L00A – PreQuiz Solutions	
2	Jan20	3	Jan20Monday Labor Day ----- USC Holiday	
	Jan22	4	L01 - Fourier Series,	HW#1: L01
3	Jan27	5	L01 - Orthogonal Series Expansions	
	Jan29	6	L0 2- Eigenvalues, Eigenvectors & Eigenfunctions	HW#2: L02
4	Feb 3	7	L03 - System of ordinary Differential Equations	
	Feb 5	8	Applications	HW#3: L03
5	Feb10	9	L04 - Partial Differential Equations (PDE)	
	Feb12	10	Method of Separation of Variables	HW#4: L04
6	Feb17	11	Feb17Monday President's Day ----- USC Holiday	
12-1:50PM		Wed	MIDTERM #1: Lectures 01-04	HW#5: L5.1-3
7	Feb24	12	L05.1-3 - One Dimensional (1D) Wave Equation	
	Feb26	13	L05.4-5 - One Dimensional (1D) Beam Equation	HW#6: L05,06
8	Mar 3	14	L06.1,3 - (2D) Wave Equation	
	Mar 5	15	L06.2 - Non-homogeneous PDE	HW#7; L06,07
9	Mar10	16	L06.3 - Non-homogeneous PDE cont	
	Mar12	17	L07.1-4 – 1D Heat Equation	HW#8: L07
10	Mar17	18	L07.5 - 2D Heat Equation	
	Mar19	19	L07.6 – Non-homogeneous Heat Equation	HW#9: L08
11	Mar24	20	L08.1,2 – 2D Laplace Equation in Rectangular Coord	
12-1:50PM		Wed	MIDTERM #2: Lectures 05-09	HW#10: L09
12	Mar31	21	L08.3 2D Laplace Equation in Cylind. (Polar) Coord	
	Apr 2	22	L09.1 – 2D Wave Equation in Cylindrical Coordinates	HW#11 L10
13	Apr 7	23	L09.2– 2D Wave Equation (cont.): Symmetric case	
	Apr 9	24	L10 -Sturm-Liouville Problem-	HW#12,13:L11,12
14	Apr14	25	L11 – Fourier Transform	
	Apr16	26	L11 – Fourier Transform, cont.	
15	Apr21	25	L12 Laplace Transform	
	Apr23	26	L12 Laplace Transform (cont.)	
16	Apr28 Apr30	26	Review of FINAL MIDTERM (No. 3): Lectures 07-12 Final MT#3	

STATEMENT ON ACADEMIC INTEGRITY

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own.

All students are expected to understand and abide by these principles. *SCampus*, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A:

- <http://www.usc.edu/dept/publications/SCAMPUS/gov/>. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty.
- The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.

STATEMENT FOR STUDENTS WITH DISABILITIES

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible.

DSP Contact Information

- Office Location: STU 301
- Open: 8:30 a.m. until 5:00 p.m., Monday through Friday.
- Phone number: (213) 740-0776