

CE 526 Engineering Mathematical Methods 29741R (3 units)

2018Fall Semester — Course Syllabus

Professor	Vincent Lee, vlee@usc.edu and Athanassios Fokas. Fokas@usc.edu		
Office	KAP 230B and OHE		
Phone	(213) 740-0568		
Blackboard	Register at 1) https://courses.uscdcn.net and 2) https://piazza.com		
Office Hours	MW9-10am, MW 2:50-3:20pm		
Teaching Assistant			
Email			
Office Hours			
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	%
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CE 526 Engineering Mathematical Methods –Class Schedule

DATE		Lecture	Topics	Homework
Week	WED	No.		Posted on Blackboard Due Wed Next
1	8/20	1	L00 - Review - PreQuiz	
		2	L00A – PreQuiz Solutions	
2	8/27	3	L01 - Fourier Series,	
		4	Orthogonal Series Expansions	HW#1: L01
9/03 Monday Labor Day ----- USC Holiday				
3	09/10	5	L0 2- Eigenvalues, Eigenvectors & Eigenfunctions	
		6		HW#2: L02
4	09/17	7	L03 - System of ordinary Differential Equations	
		8	Applications	HW#3: L03
5	09/24	9	L04 - Partial Differential Equations (PDE)	
		10	Method of Separation of Variables	HW#4: L04
6	10/01	11	L05.1-3 - One Dimensional (1D) Wave Equation,	
4:55-6:10pm		Mon	MIDTERM #1: Lectures 01-04	HW#5: L5.1-3
7	10/8	12	L05.4-5 - One Dimensional (1D) Beam Equation	
		13	L06.1,3 - (2D) Wave Equation	HW#6: L05,06
8	10/15	14	L06.2 - Non-homogeneous PDE	
		15	L07.1-4 – 1D Heat Equation	HW#7; L06,07
9	10/22	16	L07.5 - 2D Heat Equation	
		17	L07.6 – Non-homogeneous Heat Equation	HW#8: L07
10	10/29	18	L08.1,2 – 2D Laplace Equation in Rectangular Coord	
		19	L08.3 2D Laplace Equation in Cylind. (Polar) Coord	HW#9: L08
11	11/5	20	L09.1 – 2D Wave Equation in Cylindrical Coordinates	
4:55-6:10pm		Mon	MIDTERM #2: Lectures 05-09	HW#10: L09
12	11/12	21	L09.2– 2D Wave Equation (cont.): Symmetric case	
		22	L10 –Sturm-Liouville Problem-	HW#11 L10
13	11/19	23	L11 – Fourier Transform	

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DATE		Lecture	Topics	Homework
Week	WED	No.		Posted on Blackboard Due Wed Next
		24	L11 – Fourier Transform, cont. or L12 Laplace Transform	HW#12,13:L11,12
	11/21		USC Holiday on Wed before Thanksgiving	
11/23 – 11/25 Wed-Fri Thanksgiving (USC Holidays)				
14	11/28	25	L12 Laplace Transform (cont.)	
			Review of FINAL MIDTERM (No. 3): Lectures 07-12	
12/10		Mon	Final 2-4pm (to be revised)	
Christmas Holidays				

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