

155: 507 **ANALYTICAL METHODS FOR CHEMICAL AND BIOCHEMICAL ENGINEERING** FALL 2009

Web page: Sakai webpage  
Lectures: W 5:00pm-8:00 pm BME 116

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Course Description: The purpose of this course is to provide fundamental instruction on the principles of advanced mathematics that can be used as the basic knowledge for the solution of complex chemical engineering problems.

Office hours: By email arrangement

Teaching Assistant: Kubra Kamisoglu  
Office hours: TBA

Course Objective:

Educate students to understand and been able to formulate and efficiently handle problems central to chemical and process industry involving advanced mathematics.

Texts:

Required

- *Advanced Engineering Mathematics* (required)  
By D.G. Zill and M.R. Gullen.  
Published by Jones and Barlett, Third Edition, 2005.

Other books with more chemical engineering applications

- *Applied Mathematics and Modeling for Chemical Engineers*  
By R.G. Rice and D.D. Do  
Published by John Wiley, 1995
- *Mathematical Methods in Chemical Engineering*  
By A. Varma and M. Morbidelli.  
Published by Oxford Press, 1997

Class Participation:

To improve class participation, students with most presence in the class will get up to 10 points extra in their final grade. Class participation includes quizzes.

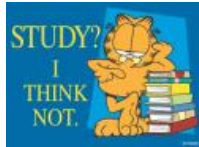
Assessment:

Homework and group project assignments (will be explained in the classroom): 30%, 1<sup>st</sup> Exam: 25%, 2<sup>nd</sup> Exam: 20%, 3<sup>rd</sup> Exam 25%

Topics covered:

Week	Date	Topic	Book Chapter
1	Sep. 2	Intro - ODEs First Order Equations	1-2
2	Sep. 9	ODEs First Order Equations	1-2

3	Sep. 16	ODEs Higher Order Equations	3
4	Sep. 23	ODEs Laplace Transforms – Series Solutions	4-5
5	Sep. 30	ODEs Numerical Methods	6
6	Oct. 7	1 <sup>st</sup> Exam: ODEs	
			
7	Oct. 14	Linear Algebra: Matrix and vector algebra	7-8
8	Oct. 21	Linear spaces, operators and equations – Eigenvalue Problem	9-notes
9	Oct. 28	2 <sup>nd</sup> Exam : Linear algebra	
			
10	Nov. 4	PDEs Combination of Variables	13
11	Nov. 11	No Class – AIChE Conference	
12	Nov. 18	PDEs Sturm-Liouville systems/Separation of Variables	12
13	Nov. 25	Happy Thanksgiving!	
			
14	Dec. 2	PDEs Transform methods/Numerical methods	15/16
13	Dec. 9	3 <sup>rd</sup> Exam : PDEs	



Have a great Winter Break!

