

ENGG*2400 Engineering Systems Analysis



School of Engineering,
Fall 2012

(August 29, 2012)

Instructor:

Prof. Bob Dony
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Web site: CourseLink
Office hours: Tue 14:00-16:00

Teaching Assistants:

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Prerequisites:

Prerequisites: ENGG*1210, ENGG*1500, MATH*1210

Corequisite: MATH*2270

NOTE: You may be removed from this course if you do not have the correct prerequisites.

Schedule:

Class times: MWF 08:30 to 09:20 (ALEX 200)

Tutorial times:

Mon 12:30 - 13:20 MACK 235
Mon 16:30 - 17:20 MACK 233
Tue 11:30 - 12:20 MACK 233
Wed 11:30 - 12:20 MACK 237
Wed 16:30 - 17:20 MACK 227
Fri 16:30 - 17:20 MACK 227

Course Description:

This course is concerned with the modeling and response analysis of common systems encountered in engineering such as mechanical, electrical, thermal, hydraulic, biological, and environmental systems. Applications of multivariate calculus, linear algebra, and differential equations are made to simulate and analyse such systems. Solution techniques covered include mathematical and computer-aided approaches.

Course Objective:

To provide the student with the analytical skills required to model engineering systems. Students will learn to identify the relevant elements that comprise a system, apply elemental laws and general theorems to derive mathematical models, and then solve the mathematical models using techniques taught in other courses as well as using computer software for system simulation.

Course Text:

Woods & Lawrence, *Modeling and Simulation of Dynamic Systems*, Prentice-Hall, 1997

Major Topics:

Static systems analysis. Introduction to dynamic systems. Hydraulic, electrical, thermal and mechanical system examples. Analytical solution techniques in time and transform domains. Simulations. Frequency response.

Evaluation:

In Class Quizzes:	Sept 21 Oct 3 Oct 26 Nov 2 Nov 23	In class	10% (best 4 of 5)
Midterm Test:	Wed. Oct. 17, 17:30-18:30 Wed. Nov. 14, 17:30-18:30	Room TBD	20%
Final Exam:	Thu. Dec. 13, 08:30-10:30	Room TBD	50%

Academic Misconduct:

Please familiarize yourself with your Academic Responsibilities, and the Regulations and Procedures as outlined in the Undergraduate Calendar. Another informative site is the tutorial on Academic Integrity. Please also note the section on Academic Misconduct in your Engineering Program Guide and the School of Engineering Code of Ethics

Tentative Schedule:

Week	Topics	Chapters
1-3	Hydraulic, electrical, thermal, mechanical	3,4,5,6
2-4	Graphs, nodes & loops	n/a
5	Model forms	1,2
6	State space	G
7	Numerical solution	9,H
8	Review of diff. equ.	9,E
9-11	Laplace solution	F
12	Frequency response	8