MECHANICAL ENGINEERING PROGRAM

ABET COURSE SYLLABUS

ME 330: Analysis of Dynamic Systems (2 credit): Required Course

Course Description (2008-2010 Catalog):

Mathematical modeling and analysis of dynamic systems with mechanical, electrical, and fluid elements. Topics include: time and frequency domain solution, state space modeling and solutions, linearization, numerical solution using Matlab.

Prerequisite Course: MATH 431, ME 242

Prerequisite by Topic:

- Dynamics
- Differential equation

Textbook: Modeling & Analysis of Dynamic System by Close et al, 3rd ed., Wiley

Other Reference Material: N/A

Course Coordinator: Woosoon Yim, Professor

Course learning outcomes:

(a) Model the dynamic system in either input/output equation or state space representation.
(b) Linearize the nonlinear elements in the dynamic system about operating conditions.
(c) Understand the transient and steady state response of dynamic systems and the effects of the system parameters changes on the responses.
(d) Simulate the dynamic response using Matlab and Simulink.

Relationship of Course to Mechanical Engineering Program Outcomes:

Educational Objective1: Provide mechanical engineering graduates with technical capabilities.					**Educational Objective 2:** Prepare the mechanical engineering graduates to have effective workplace skills.				**Educational Objective 3:** Instilling a sense of responsibility as a professional member of society.			
1.a	**1.b**	**1.c**	**1.d**	**1.e**	**2.a**	**2.b**	**2.c**	**2.d**	**3.a**	**3.b**	**3.c**	**3.d**
H		**L**	**H**	**H**	**L**			**M**				

(L)ow (M)edium (H)igh

Topics Covered:

1. Laplace transformation
2. Dynamic system modeling (mechanical, electrical, fluid)
3. Linearization
4. System response (transient)
5. System response (steady state)
6. Frequency response of dynamic system
7. I/O equation and transfer function
8. State space representation of dynamic system and responses
9. Simulation of dynamic system using Matlab and Simulink

Laboratory Projects: None

Class/Laboratory Schedule: 50 minutes lecture two sessions per week

Assessment of Student Progress toward Course Objectives

Two written exams, home-works, one project, and final exam

Class/Laboratory Schedule: MW 10:00-10:50 AM (Spring Semester)

Contribution of Course for meeting Professional Component:

(a) Mathematics and basic sciences:	0 credit
(b) Engineering Topics (Design/Science):	2 credit
(c) General Education:	0 credit
(d) Others:	0 credits

Prepared By: **Date:**

Woosoon Yim September 1, 2009