Modeling of Engineering Systems (ME 750C), Spring 2014

Department of Mechanical Engineering, Wichita State University

Instructor:	Dr. Gisuk Hwang
Office location/hours:	EB 101C, 10:30 am – 12:00 pm, Tue/Wed
Email:	Gisuk.Hwang@wichita.edu
Phone:	316-978-6022
Webpage:	TBA
Class schedule and location:	Wed., 3:00 – 5:30 pm, EB 102
Prerequisites:	MATH 243 (Calc II), PHYS 313 (Phys I), or by instructor permission

Textbook: *Mathematical Methods in the Physical Sciences*, 3th Ed., Wiley, by Mary L. Boas

References: *Advanced Engineering Mathematics*, 10th Ed., Wiley, by Erwin Kreyszig

Course Description: This course provides the rigorous understandings of the physics and mathematics in order to model practical scientific and engineering problems in fluid mechanics, heat transfer, solid mechanics and vibrations. This course primarily focus on analytical approach, but introduces simple computational methods for modeling engineering systems using computer codes.

Objectives:

To gain an understanding of engineering mathematics including the series, ordinary/partial differential equations

To apply the above concepts to typical engineering systems, including mass, energy, and momentum transport, conversion, and storage systems

Grading:

Homework	50%
Project Proposal	20%
Project Final Report	20%
Project Final Presentation	10%

Reading assignments & homework:

Students are strongly encouraged to go through the reading assignments before the class. Homework problems are assigned in Blackboard. Homework due is given at the following week, same date unless it is specified. Students are strongly encouraged to come to office hours for homework related issues, and to form study groups with your peers.

No extra credit work nor late homework will be assigned/accepted.

Make-up works will be administered only upon the submission of the relevant documents, explaining the reasons for the missing ones.

Class Schedule

Week	Date	Subject	Reading
1	1/22	Introductions and Series	Chap 1
2	1/29	Series and Complex Numbers	Chap 1&2
3	2/5	Linear Equations I	Chap 3
4	2/12	Linear Equations II	Chap 3
5	2/19	Ordinary Differential Equations I	Chap 8
6	2/26	Ordinary Differential Equations II	Chap 8
7	3/5	Partial Differential Equation I	Chap 4
8	3/12	Partial Differential Equation II	Chap 4
9	3/19	Spring break (no class)	
10	3/26	Vector Analysis I	Chap 6
11	4/2	Vector Analysis II	Chap 6
12	4/9	Fourier Series	Chap 7
13	4/16	Fourier/Laplace transform	Chap 7
14	4/23	Special Functions	Chap 11
15	4/30	Molecular Simulations	Extra Sheets
16	5/7	Final presentation	
	5/14	Final report due	