

ME 1014 – Dynamic Systems
Fall, 2008
Last Revised 8/25/08

- Instructor:** Prof. Jeffrey Vipperman
- Office:** 531 Benedum
- TA:** Tim Ryan, tsr2@pitt.edu, (Office hours coming)
- Contact Info:** 624-1643 (voice), 624-4846 (fax), jsv@pitt.edu (email)
- Webpage:** <http://www.pitt.edu/~jsv/courses/me1014>
- Office hours:** (*Tentative*) MWF 9:30-10:30, and by appointment; you can also solicit help by email.
- Prerequisites:** MATH 0250, PHYS 0175, ME 0031
- Corequisites:** ME 1041
- Objectives:** **To model, analyze, and solve for the response of dynamic systems.** Subjugate objectives include:
1. Recognize that a few ordinary differential equations of motion govern all lumped parameter dynamic systems, whether they are mechanical, electrical, thermal, fluid, etc. or a combination thereof.
 2. Therefore, all lumped parameter dynamic systems have the same behaviors
 3. Solve the response of dynamic systems using a variety of techniques, including direct solution, Laplace and Fourier transform methods, and numerically.
 4. Analyze both the transient, steady-state, and total response of systems.
 5. To recognize that ME1041 is related and can be thought of as the laboratory component for this class.
 6. To provide the foundation for upper-level courses, e.g. vibrations, controls, and MEMS.
- Textbook:** Dynamic Systems, Modeling and Analysis, H. V. Vu and R. S. Esfandiari, The McGraw-Hill Companies, 1997, ISBN: 0-07-021673-8
- Homework:** Homework is Assigned and collected weekly. Problems, answers, and occasional hints will be posted to the webpage: <http://www.pitt.edu/~jsv/courses/me1014/>
- Exams:** 4 total: 3 Midterms and a Final;
- Grading:** Homework– 10%, Exam 1 – 22%; Exam 2 – 22%; Exam 3 – 22%; Final Exam – 24%
- Policies:**
1. Late homework is 25% off per day until the set is graded.
 2. No make up tests without extenuating circumstances and prior approval.
 3. Tests will come from your notes, the book, and your homeworks. (I will supplement the book in places).
 4. If you have a disability for which you are or may be requesting an accommodation, please contact both me and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (TTY), as early as possible in the term. DRWS will verify your disability and determine reasonable accommodations for this course. DRWS website: <http://www.drs.pitt.edu>
 5. Please read abide by the academic integrity policies at: <http://www.pitt.edu/~provost/ai1.html>.

ME 1014 - Dynamic Systems, Fall 2008 (TENTATIVE SYLLABUS)

Date	Lesson	Topic(s)	Reading	Section
8/25/2008	1	Overview, Complex Numbers	1-8	1.1, 1.2
8/27/2008	2	Complex Variables	8-11	1.3
8/29/2008	3	Solving Linear ODEs	11-21	1.4
9/1/2008		<i>Labor Day no class</i>		
9/3/2008	4	ODEs, Laplace Transforms	22-29	1.5
9/5/2008	5	Laplace Transforms	29-34	1.6
9/8/2008	6	Inverse Laplace Transforms	34-44	1.7
9/10/2008	7	System Response with Laplace	50-61, 64-9	1.9
9/12/2008	8	Review of Linear Algebra	76-101	2.1-2.4
9/15/2008	9	Configuration and Matrix Form Models	108-112	3.1
9/17/2008	10	State Space Modeling	113-124	3.2
9/19/2008	11	Input/Output Equations and Transfer Functions	125-138, 164-7	3.3,3.4
9/22/2008		Review		
9/24/2008	12	Test 1		
9/26/2008	13	State Space Modeling	138-143	3.5
9/29/2008	14	First Order Transient Response	334-339	7.1-7.2
10/1/2008	15	Second Order Transient Response	339-355	7.3
10/3/2008	16	Second Order Transient Response	339-355	7.3
10/6/2008	17	Transient Response of Higher Order Systems	356-361	7.4
10/8/2008	18	Frequency Response	362-370	7.5
10/10/2008	19	Convolution Integral	370-374	7.6
10/13/2008		<i>Fall Break</i>		
10/15/2008	20	Fourier Analysis	385-396	7.9
10/17/2008	21	Fourier Analysis	385-396	7.9
10/20/2008	22	Review		
10/22/2008		Test 2		
10/24/2008	23	Mechanical Elements, Equivalence	172-181	4.1-4.3
10/27/2008	24	Electromechanical Systems	265-279	5.1-5.3
10/29/2008	25	Translational Mechanical Systems	190-213	4.5
10/31/2008	26	Translational Mechanical Systems	190-213	4.5
11/3/2008	27	Rotational Mechanical Systems	213-226	4.6
11/5/2008	28	Electromechanical Systems	279-288	5.4
11/7/2008	29	Impedance Methods	290-295	5.5
11/10/2008	30	Thermodynamics	304-311	6.1, 6.2
11/12/2008	31	Fluid Mechanics	311-315	6.3
11/14/2008	32	Pneumatic Systems	315-320	6.4
11/17/2008	33	Liquid-Level Systems	320-323	6.5
11/19/2008	34	Thermal Systems (heat transfer)	323-327	6.6
11/21/2008	35	Review		
11/24/2008		Test 3		
11/26/2008		<i>Thanksgiving Break</i>		
11/28/2008		<i>Thanksgiving Break</i>		
12/1/2008	36	Advanced Topics, Review		
12/3/2008	37	Review for Final		
12/5/2008	38	Review for Final		
Thur 12/11/08		Final Exam, 2:00-3:50		cummulative