

ME 1015 – Kinetics
Fall, 2003
Last Revised 8/29/03

- Instructor:** Prof. Jeffrey Vipperman
- Office:** 531 Benedum
- Contact Info:** 624-1643 (voice), 624-4846 (fax), jsv+pitt.edu (email)
- Webpage:** <http://www.pitt.edu/~jsv/courses/me1017>
- Office hours:** Tentatively from 2:00-3:00 M and 9:30-10:30 WF; Feel free to solicit help by email
- TA:** none
- Prerequisites:** Math 0250, ME0022
- Objectives:**
1. To mathematically describe motion of particles and rigid bodies using various coordinate systems, geometry, and calculus (kinematics)
 2. To calculate forces caused by accelerations or visa-versa using three different methods: Newton's Second Law, Principle of Work-Energy, and the Principle of Impulse-Momentum.
 3. Apply these two principles over and over for various scenarios.
- Textbook:** J. L. Meriam and L. G. Kraige, *Engineering Mechanics: Dynamics*, 5/e, John Wiley & Sons, Inc., New York, 1997, ISBN: 0-471-40645-7.
- Homework:**
1. 2-4 homework problems will be assigned for each class
 2. HW will be collected every Monday
 3. A subset of problems from the set will be graded (typ. 2 or 3 problems)
 4. Solutions will be posted after collecting to <http://www.pitt.edu/~jsv/courses/me1017>
- Exams:** Four 1-hour exams during the semester.
- Final Exam:** Thursday, December 11, 2003, 4:00-5:50
- Grading:**
- Final Grade Breakdown:
 1. 10% – HW
 2. 60% – Exams 1-4
 3. 23% – Final Exam
 - You Earn major points for:
 1. Drawing a Free Body Diagram or other diagram as appropriate
 2. Determining and stating what is desired in a kinematic or kinetic sense
 3. Identifying and stating a valid method of solution
 4. Subsequently stating the correct equations
 - Then you Loose minor points for:
 1. Wrong numbers/answers
 2. Wrong signs
 3. Wrong dimensions in equations (typically more significant point loss).
- Other 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. 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.<http://www.drs.pitt.edu>

ME 1015 Schedule - Fall 2003

Lesson #	Date	Topic	Section(s)	Reading pp.	HomeWork
1	8/25/2003	Overview and Background	1.1-1.7	3-17, 679-694	1.1, 1.4, 1.7, 1.12
2	8/27/2003	Rectilinear Motion	2.1-2.2	21-30	2.2, 2.11, 2.15, 2.29
3	8/29/2003	Curvilinear Motion, Rectangular Coords.	2.3-2.4	41-48	2.63, 2.65, 2.80
	9/1/2003	<i>Labor Day Holiday</i>			
4	9/3/2003	Normal-Tangential Coordinates	2.5	56-60	
5	9/5/2003	Polar Coordinates	2.6	68-72	
6	9/8/2003	3-d Curvilinear Motion	2.7	81-84	
7	9/10/2003	Relative Motion Analysis	2.8	90-93	
8	9/12/2003	Pulleys	2.9	100-102	
9	9/15/2003	Review	ch 1-2, pp106-7	106-107	
	9/17/2003	Test I	-	-	-
10	9/19/2003	Newton's Law: Rectilinear Motion	3.1-3.4	114-26	
11	9/22/2003	Newton's Law: Curvilinear Motion	3.5	137-40	
12	9/24/2003	Work, Forms of Kinetic Energy	3.6	154-62	
13	9/26/2003	Forms of Potential Energy	3.7	172-7	
14	9/29/2003	Linear Impulse and Momentum	3.8-3.9	187-91	
15	10/1/2003	Angular Impulse and Momentum	3.10	202-6	
16	10/3/2003	Impact	3.11-3.12	213-8	
17	10/6/2003	Relative Motion	3.14	239-44	
18	10/8/2003	Review	3.1-3.14, p. 250	250	
	10/10/2003	Test II	-	-	-
19	10/13/2003	Kinetics of a System of Particles: NSL, W-E	4.1-4.3	263-7, 274	
20	10/15/2003	System of particles: Impulse-Momentum	4.4-4.5	267-75	
21	10/17/2003	Mass Moments of Inertia	App. B	651-73	
22	10/20/2003	Rotation	5.1-5.2	321-8	
23	10/22/2003	Absolute Motion	5.3	334-7	
24	10/24/2003	Relative Velocity	5.4	346-52	
25	10/27/2003	Instantaneous Center of Zero Velocity (ICV)	5.5	361-3	
26	10/29/2003	Relative Acceleration	5.6	371-5	
27	10/31/2003	Relative Motion: Rotating Axes	5.7	384-92	
28	11/3/2003	Review	ch 4-5, App. B	401	
	11/5/2003	Test III	-	-	-
29	11/7/2003	Newton's Second Law: Translation	6.1-6.3	409-21	
30	11/10/2003	Pure Rotation	6.4	430-2	
31	11/12/2003	General Plane Motion	6.5	443-9	
32	11/14/2003	Work-Energy Methods	6.6	460-7	
33	11/17/2003	Virtual Work	6.7	478-81	
34	11/19/2003	Impulse-Momentum Methods	6.8	487-94	
35	11/21/2003	Review	6.1-6.8, p. 504	504	
	11/24/2003	Test IV	-	-	-
	11/26/2003	<i>Thanksgiving Break</i>	-	-	-
	11/28/2003	<i>Thanksgiving Break</i>	-	-	-
36	12/1/2003	Catch-up or Advanced Topic.			
37	12/3/2003	FE Review 1		Ch. 1-6	
38	12/5/2003	FE Review 2		Ch. 1-6	
	12/11/2003	Final Exam, Thursday, 4:00-5:50pm, Cumulative			