Syllabus v1.1, T&AM 203, Spring 1997

Also see the *Course information* sheet and the course WEB page: http://www.msc.cornell.edu/ sdh4/203/203.html.

Lecture Dates	**Topics**	**Text Sections** (or pages)	**Homework problems*** (due Wed. in section)
Tu 1/21 Th 1/23	Intro. to COMPUTER. Course Summary. FBDs.	Preface, CH1, CH2.1. Matlab: 15-37, 147-152, 39-54, 55-58,73-87	[do MATLAB tuts!], [1.32-1.155] 1) ODE handout, 2) Matrix handout, 3) 1.65 (vectors)
Tu 1/28 Th 1/30	FBD's and statics	2.1 - 2.4	[2.1 - 2.80], 1) 2.69 w/ gravity (masss & strings), 2) 2.78 (spool), 3) Use WM to redo (1) or (2)
Tu 2/4 Th 2/6	Position, velocity, & acceleration; 1D mechanics	3.1-2	[3.1-16], 1) 3.2 (circles, $\underline{\boldsymbol{v}}$ vs v etc), 2) 3.8abc (1 hp bicycler), 3) 3.14 ($F =$'$\sin t$')
Tu 2/11 Th 2/13	Harmonic oscillator, springs, dashpots and many masses	3.3-4	[3.17-23, 3.25-30], 1) 3.19 (vert motion in (c)), 2) 3.28 (for some param values, plot $x_B(t)$.)
Tu 2/18 Th 2/20	Particles in 2D and 3D, numerical solutions	3.5, 7.1, 7.4 (but not polar or path coords)	[3.31-33, 7.25-28, 7.51acfij, 7.52bc] 1) 3.32 (canon ball in air), 2) 7.53 (missile)
Tues 2/25	— **Prelim 1:** Covers all topics above — (7-8:30+)		
Tu 2/25 Th 2/27	Center of mass, constrained 1D motion, ropes and pulleys	3.6 4.1-4.2	[all CM probs in book and in Calc text] 1) derive shaded formula on pg. 194 2) 4.1 (train), 3) 4.2 (simple pulleys)
Tu 3/4 Th 3/6	Pulleys (cont't), 2D forces in 1D motion	4.2, 4.3	[4.2-4.19], [all 2D probs in section 4.3] 1) 4.19 (messy pulley), 2) 4.31 (block on cart), 3) 4.53 (car braking, front vs rear. Optional: compare with WM simulation.)
Tu 3/11 Th 3/13	3D forces in 1D motion, circular motion kinematics	4.3, 5.1, 6.1	[4.20-61], [5.1-17], 1) 4.37 (3D guyed shelf), 2) 4.54 (3D car braking), 3) 6.5 (kinematics of circular motion)
**********	**********Spring break**********		
Tu 3/25 Th 3/27	mechanics of circular motion, simple pendulum	5.1, 6.1, 5.2, 6.2 (pendulum parts)	[5.1-31 & all particle probs in Ch 6] 1) 5.14 (springy mass in tube), 2) 6.47 (simple pendulum, optional: compare with WM), 3) 5.23 (≈fly ball governor)
Tue 4/1	— **Prelim 2:** Covers all topics above (comprehensive) — (note change of date, 7-8:30+)		
Tu 4/1 Th 4/3	Constant $\underline{\boldsymbol{\omega}}$ kinematics and mechanics (rigid bodies)	5.3	[5.32-87], 1) 5.46(3D $\underline{\boldsymbol{\omega}}$ kinematics), 2) 5.70 (gears), 3) 5.87 (rod on shaft)
Tu 4/8 Th 4/10	Moment of Inertia, [$\boldsymbol{I}$]	5.4, 5.5 6.3	[5.88-5.111], [all 2D probs in Ch 6], 1) 5.103 (find [$\boldsymbol{I}$] matrix), 2) 6.18 (pulley w/ mass)
Tu 4/15 Th 4/17	Mechanics using [$\boldsymbol{I}$] Dynamic balance	5.5, 5.6, 6.4, 6.5	[5.112-129], [6.1-66], 1) 5.87 (again, using [$\boldsymbol{I}$]), 2) 5.118 (disk & shaft), 3) 6.55 (3D skewer pend.)
Tues 4/22	— **Prelim 3:** Covers all topics above (comprehensive) — (7-8:30+)		
Tu 4/22 Th 4/24	Polar coordinates	7.2 7.4	[all of Ch 7 but path coord], 1) 7.11 (pick apart accel. formula), 2) 7.38 (rusty wrist gun, also plot trajectory)
Tu 4/29 Th 5/1	General 2D rigid body motion, rolling	8.1-3, 8.5	[all 2D probs in Ch 8], 1) 8.11 (force on stick in space) 2) 8.75 (race of rollers), 3) 8.79 (standing. Optional+: plot motion, show it isn't sinusoidal)
Mon 5/12	— **Final exam:** comprehensive — (scheduled as 'exception', 3:00-5:30)		

* [ ] These are problems you should know how to do but should not hand in.

Please follow these homework directions to ease the work of sorting and grading.

a) Write the following on the upper right hand corner of your homework (making appropriate substitutions):
Yourfirstname Lastname, TAM 203, Homework *n*, due: *due date*, Section *m*, *section time*, *TA name*

b) At the top of your homework acknowledge help from TAs, faculty, friends, relatives, enemies, texts or notes.

c) Define all signs and directions with sketches and/or words. Use correct units and vector notation. *Reasonable justification* should be given for all work. Draw a free body diagram or write the phrase 'FBD not relevant' for each mechanics problem.

d) If a problem seems ambiguous, clearly state the reasonable assumptions you use. Define all variables.

e) Box in your answers.

- *If you can do the problems only immediately after looking something up or getting help you are not learning what you should.*