ME 515 Vibrations of Complex Systems Spring 2011 Course Information

Instructor:

Professor Allan D. Pierce; Lecture: Tues, Thurs 12–2 pm, SOC B59 Office: ENG 401. Phone: (508) 833-0193, 3-4841. adp@bu.edu Office Hours: ordinarily Tues 10–12, Thurs 10–12, F 8–10 am

Texts:

Jerry H. Ginsberg, *Mechanical and Structural Vibrations* Various handouts

Hardware and Software Requirements:

Access to a scientific calculator Access to a computer with either *MatLab* or *Octave* installed

Syllabus:

See attached; many topics are not included in the text.

Grading:

Class attendance	10%	Homework	40%
Class attentiveness	5%	Quizzes	15%
Promptness	5%	Final Exam	25%
Ethics	-100%		

Course prerequisites: Graduate standing, completion of all the mechanics and mathematics courses in an ME undergraduate degree program: three semesters of calculus, differential equations, advanced engineering mathematics, basic engineering mechanics, statics, dynamics, strength of materials, fluid mechanics. Boston University undergraduates are encouraged to take ME 441 instead, as the pace and level of expectation in that course is more commensurate with the undergraduate curriculum. If you do not have these prerequisites, you should discuss the possibility of your being able to successfully complete the course with the instructor.

Week	Date	Lecture Topic	Comments
1	Tues 1/18	Galileo, energy concepts	First class
	Thurs $1/20$	Lagrange's equations	
2	Tues $1/25$	Linearization, matrices	
	Thurs $1/27$	Constant frequenct oscillations	
3	Mon $1/31$		Enrollment deadline
	Tues $2/1$	Transients	
	Thurs $2/3$	Energy averages	
4	Tues $2/8$	Spectral density	
	Thurs $2/10$	Natural modes	
5	Tues $2/15$	Modal formulation	
	Thurs $2/17$	Symmetry techniques	
6	Mon $2/21$	BU Holiday	
	Tues $2/22$	No class	Drop without a W
	Thurs $2/24$	Quiz	
7	Tues $3/1$	Absorption dampers	
	Thurs $3/3$	Rayleigh's principle	
8	Tues $3/8$	Impedance	
	Thurs $3/10$	O'Hara-Cunniff theorem	
9	Tues $3/15$	No class	Spring recess
	Thurs $3/17$	No class	Spring recess
10	Tues $3/22$	Modal mass, fuzzy structures	
	Thurs $3/24$	Hamilton's principle	
11	Tues 3/29	Continuous systems	
	Thurs $3/31$	Quiz	
	Fri 4/1		Last drop date
12	Tues $4/5$	Strings	
	Thurs $4/7$	Rods and beams	
13	Tues $4/12$	Mode functions	
	Thurs $4/14$	Rayleigh-Ritz	
14	Mon 4/18	BU Holiday	
	Tues 4/19	Power flow	
	Thurs $4/21$	No class	Monday Classes
15	Tues $5/3$	Statistical energy analysis	
	Thurs $5/5$	Review	Last Class
16	Fri 5/13	Final Exam	9–11 am