ME 5322 Vibrations
J-term Syllabus (Taos)

Instructor: Dr. Elena Borzova
301B Embrey
Phone: 8-114, e-mail: eborzova@lyle.smu.edu

Lectures: Location TBD

Website: TBD

Course Description: Review of fundamentals of vibrations with application of simple machine and structural members. Harmonic motion, free and forced vibration, resonance, damping. Simple and multiple degree-of-freedom systems.

Prerequisite: ME 2320, MATH 2343, MATH 3353

Required

Textbook: *Engineering Vibrations*, 4th Edition, Daniel J.Inman, Prentice Hall, New Jersey.
Grading: Class Participation 10%
Two Exams 30 % each
Final Exam 30%

Homework and Exam Policies:

Homework will be assigned at the end of each day (except the last day). The homework is provided as an exercise for the students, but will not be graded. Homework and additional exercises will be discussed in class and in groups. Participation in the group discussions will be weighted heavily in the class participation grade.
Three exams will be given during the J-Term. The exams comprise the majority of the grade for the course.

Lecture Policies:

Class attendance is mandatory. The class time will be divided between lecture, homework/exercise discussion groups, and exams.

Notices:

Disability Accommodations: Students needing academic accommodations for a disability must first register with Disability Accommodations & Success Strategies (DASS). Students can call 214-768-1470 or visit http://www.smu.edu/Provost/ALEC/DASS to begin the process. Once registered, students should then schedule an appointment with the professor as early in the semester as possible, present a DASS Accommodation Letter, and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement.

- **Religious Observance**: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

- **Excused Absences for University Extracurricular Activities**: Students participating in an officially sanctioned, scheduled University extracurricular activity should be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)

- ## Student Learning Outcomes:
- **A**: an ability to apply knowledge of mathematics, science, and engineering
- **E:** an ability to identify, formulate, and solve engineering problems

Lecture Schedule
ME 5322 J-Term 2017

Date (Day)	Topics	Homework
1/9 (M)	1.1 Intro to Free Vibration 1.2 Harmonic Motion 1.3 Viscous Damping	1.7; 1.9; 1.11; 1.13; 1.14; 1.16; 1.19;1.39; 1.48; 1.52; 1.53; 1.55; 1.65; 1.69; 1.91; 1.92; 1.93
1/10(Tu)	1.4 Modeling, Energy Method 1.5 Stiffness 1.6. Measurement, Stability 2.1 Harmonic Excitation of Undamped Systems	1.100; 1.101; 1.103; 1.104; 1.112; 1.113, 2.1; 2.4; 2.7; 2.9; 2.20; 2.21; 2.22; 2.24; 2.25; 2.28; 2.31; 2.34
1/11 (W)	2.2 Harmonic Excitation of Damped Systems 2.3,4 Base Excitation 2.8 Numerical Simulation, Design	2.39; 2.40; 2.42; 2.45; 2.49; 2.52; 2.57 ,2.98, 2.99.
1/12 (Th)	EXAM 1 4.1 Two-Degree-of Freedom Model (undamped) 4.2 Eigenvalues and Natural Frequencies	4.1; 4.2; 4.3; 4.4; 4.15; 4.17
1/13 (F)	4.3 Modal Analysis 4.4 More than 2 Degrees of Freedom	4.22; 4.27; 4.30; 4.40; 4.44; 4.46; 4.49; 4.50; 4.55
1/16 (M)	EXAM 2 4.4 More than 2 Degrees of Freedom 4.5 Systems with Viscous Damping	4.57; 4.62; 4.63(use mode summation method); 4.72;
1/17 (Tu)	4.6 Modal Analysis of the Forced Response	4.79 (use 50 *Cos10t, do not use 50Sin10t), 4.80 (use 10 *Cos3t, do not use 10Sin3t) ; 4.81; 4.82; 4.83.
1/18 (W)	Review EXAM 3	

Disclaimer: The lecture schedule is tentative and subject to change.