

ME 5311/AE 5311 Structural Dynamics

Spring 2015

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Textbook:

**R. R. Craig, Jr. and A.J. Kurdila, *Fundamentals of structural dynamics*
“ Second Edition, Wiley2006**

Outline:

Vibration of SDOF systems

- Introduction (Chapter 1)
- Free vibration (Chapter 2,3)
- Harmonically excited vibration (Chapter 4)
- Non-periodic vibration (Chapter 5)
- Numerical solution (Chapter 6,16)
- Frequency Domain Analysis (Chapter 7, 18.2)
- Matlab tools

Vibration of MDOF systems

- Equations of motion (Chapter 8)
- Normal mode analysis: eigenvalue problem (Chapter 9)
- Properties of vibration systems (Chapter 10)
- Free and forced response by normal mode summation(mode superposition)(Chapter 11)
- Numerical solution(Chapter 15)
- Matlab tools

Exam No.1(dates TBD)

Vibration of Continuous systems

- Vibration of string, rod and beams (Chapter 12)
- Free and forced response by normal mode summation(mode superposition)(Chapter 13)
- Matlab tools

Finite element method for Vibration analysis

Mass and stiffness matrices for rod and beams (Chapter 14)
Vibration of rods and beams (Chapter 14)
Matlab tools

Approximate methods and advanced topics

Rayleigh and Dunkerley methods (Chapter 10)
Mode acceleration method (Chapter 11)
Component mode synthesis(Chapter 17)

Final Exam(dates TBD)

Grading:

Homework:	25%
Exam No.1	30%
Final Exam	40%

A: $\geq 85\%$, B: 70 to 84%, C: 60 to 69%

D: 50 to 59%, F: $< 49\%$

Matlab tools

1. Codes: in 2014-MASDAN.zip
2. Outline: see posted file

MASDAN 2014.pdf:
Matlab programs for Structural Dynamic Analysis

