Mechanical and Industrial Engineering Syllabi   NJIT Syllabi

Fall 2019

ME 315-005: Stress Analysis

Anthony Glick

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ME315-005 – Stress Analysis

Meeting Times & Location:
T, Th 1:00 – 2:20pm
CKB 120

Course Description:
ME315 is an introductory course in stress analysis in mechanical design.

Prerequisites:
ME215, Mech237, Math222

Textbook Required:
"Advanced Mechanics of Materials and Applied Elasticity – 5th Edition"
A.C. Ugural, S.K. Fenster
Prentice Hall, 2012

Instructor:
Mr. Anthony Glick
Office hours: T, Th 2:30 – 3:30pm MEC 324
Email: aglick@njit.edu

Course Objectives:
1. To develop skills for conducting stress analysis in mechanical design.
2. To provide a foundation for the study of machine design.

Topics:
1. Weeks 1 – 3: Analysis of Stress – Stress transformation, principal stresses, Mohr's Circle

2. Weeks 4 – 5: Strain and Material Properties – Normal and shearing strains, strain transformation, stress-strain relations, strain energy

EXAM 1: End of Week 5

3. Weeks 6 – 8: Problems in Elasticity – Fundamental principles of analysis, plane stress, plane strain, stress concentration

4. Weeks 9 – 10: Failure Criteria – Failure theories, three dimensional stresses

EXAM 2: End of Week 10

5. Weeks 11 – 12: Axisymmetrically Loaded Members – Thick walled cylinders, compound cylinders, rotating disks

6. Weeks 13 – 14: Application of Energy Methods – Castigliano's Theorem, virtual work, Ritz Method

7. Week 15: Stability of Columns – Stability of columns, allowable stress, eccentrically loaded columns

Grading:
Final Exam: 30%
2 Examinations: 20% each
Homework: 25%
Attendance: 5%

Policies:
Homework submitted after due date will be penalized as follows: ½ credit if one week late and no credit beyond one week.

Statement on Academic Integrity:

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:

http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** *If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu.*