

1. Course Title:

Strength of Materials

IET 312 – 4 Credits

4 hr Lecture per week

MET Core Program Requirement

Prerequisite: , IET 311

This is a Technical content course under ABET Criterion 5

2. Faculty Member Information:

Instructor: Charles Pringle
Office: Hogue 308pringlec
Phone: 509- 963-2437
E-mail: pringlec@cwu.edu

3. Course Description:

Strength of materials, including stress analysis of axially loaded members, torsional members, beams and indeterminate structures

4. Textbook and other required materials for the course:

Mechanics of Materials, 7th ed., by Hibbeler; Prentice Hall Publ., 2008. ISBN: 0132209918,

Also required:: internet access, word processing, and spreadsheet capabilities

5. Specific Learner and Expressive Outcomes and Assessment Strategies:

| ABET Criteria # | Learning Outcomes | Assessment |
|-----------------|---|---|
| | Demonstrate an understanding of internal forces and moments within a loaded member and calculate these forces and moments. | Students will be assessed through homework assignments and exams. |
| | Properly identify and calculate both normal and shear stress and strain in axial and torsion members. | Students will be assessed through homework assignments and exams. |
| | Demonstrate an understanding of the stress-strain relationship and Poisson's ratio. | Students will be assessed through homework assignments and exams. |
| | Draw a shear and moment diagram for a variety of loaded beams using a variety of methods, including integration of an equation for a load diagram. | Students will be assessed through homework assignments and exams. |
| | Demonstrate the ability to calculate beam deflections, including writing equations for the deflected shape of an elastic beam. | Students will be assessed through homework assignments and exams. |
| | Properly construct Mohr's circle for any given state of stress and demonstrate the ability to utilize Mohr's circle to determine the state of stress at various orientations within the material. | Students will be assessed through homework assignments and exams. |
| | Demonstrate an understanding of combined loading and column buckling using Euler's buckling theory. | Students will be assessed through homework assignments and exams. |
| | Demonstrate an understanding of forces and stresses in statically indeterminate members loaded axially and in torsion. | Students will be assessed through homework assignments and exams. |

6. Course Topics and Schedule:

Review of Free Body Diagrams Chapter 1

Stress and strain Chapter 2

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| | |
|----------------------------------|------------|
| Material properties | Chapter 3 |
| Axial stress and strain | Chapter 4 |
| Exam 1 (Chapters 1 – 4) | |
| Torsional stress and strain | Chapter 5 |
| Centroids and moments of inertia | Appendix A |
| Bending in beams | Chapter 6 |
| Transverse shear | Chapter 7 |
| Exam 2 (Chapters 5 – 7) | |
| Combined loadings | Chapter 8 |
| Mohr's Circle | Chapter 9 |
| Beam Deflections | Chapter 12 |
| Column Buckling | Chapter 13 |
| Final Exam | |

7. Grading: Student Assessment Criteria

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|-----------------|-------------|
| 3 Chapter Exams | 50% |
| Homework | 25% |
| Final Exam | 25% |
| Total | 100% |

Letter grades will be assigned as follows based on the total points earned during the quarter:

| | | | | | |
|--------|----|--------|----|--------|----|
| ≥ 92.0 | A | ≥ 80.0 | B- | ≥ 68.0 | D+ |
| ≥ 90.0 | A- | ≥ 78.0 | C+ | ≥ 62.0 | D |
| ≥ 88.0 | B+ | ≥ 72.0 | C | ≥ 60.0 | D- |
| ≥ 82.0 | B | ≥ 70.0 | C- | < 60.0 | F |

8. ADA Statement:

Students who have special needs or disabilities that may affect their ability to access information and or material presented in this course are encouraged to contact me or Robert Harden, ADA Compliance Officer, Director, ADA Affairs and Students Assistance on campus at 963-2171 for additional disability related educational accommodations.

Prepared by Roger Beardsley June 22, 2009