MECE 3321-02: Mechanics of Solids

Spring 2019
TR 3:05-4:20 pm, EENGR 1.236

Instructor: Dr. Philip Park
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Phone: 956-882-6532

Class Hour: TR 3:05 – 4:20 pm (EENGR 1.236)
Office Hours: TR 1:40 – 2:55 pm (EPOB 1.103c), W 10:50 am – 12:05 pm (BSETB 2.554) or by appointment

Textbook

Course Description and Prerequisites
This course covers internal forces and deformation in solids, concepts of stress and strain, formulas for stress and deflection for elastic bars, shafts, and beams, stress and strain transformation and theories of failure.
Prerequisites: A grade of C or better in MATH 2414 (or MATH 2488) and MECE 2301 or MANE 2403.

Learning Objectives/Outcomes for the Course
The students should be able to:

* Identify, formulate, and solve the problems in solid mechanics using three governing equations: equilibrium, constitutive, and compatibility equations.
* Understand and formulate the concept of normal and shear stress/strain.
* Understand the concept of the stress-strain diagram of various materials.
* Identify and calculate the internal forces and reactions of mechanical/structural members subjected to axial, torsional, and bending loads.
* Draw free body diagram, shear force diagram, and bending moment diagram of members.
* Understand the concept of stress transformation and principal stresses and calculate the transformed stresses using Mohr’s circle.
* Identify and solve statically determinate vs indeterminate structures.
* Calculate the deflections of beams using Euler-Bernoulli beam theory.
Grading Policies

- Homework & Quizzes 20%
- Mid-term Exam 1 20%
- Mid-term Exam 2 20%
- Mid-term Exam 3 20%
- Final Exam 20%

Grading Scale: 90≤A, 80≤B<90, 70≤C<80, 60≤D<70, F<60

Grading policy for the quizzes and exams: Full mark of a problem varies based on the importance of the problem. Please note that if your solution presentation is not clear and neat, additional point deduction can be made.

- If the approach is correct, and the answer is correct: 100% of the full mark
- If the approach is correct, but the answer is wrong: 50-70%
- If the approach is wrong, but the student attempts to solve the problem: 20-40%
- If the student has not attempted (blank) or not submit the quiz: 0%

Exams

Exams will be closed book and closed notes, but a limited number of help sheets will be permitted. The exams are designed to test your individual knowledge about the subject material. Exams should be taken when scheduled. Taking an exam at another time has to be arranged with the instructor at least two weeks before the exam. The Scholastic Integrity code shall apply and will be strictly enforced.

Calendar of Activities

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<th>Tentative Schedule</th>
<th>Course Topics</th>
<th>Textbook</th>
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<td>Week 1</td>
<td>Course overview/Review of statics</td>
<td>Ch. 1-3</td>
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<td>Week 2</td>
<td>Stress, strain, stress-strain diagram</td>
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<td>Week 3</td>
<td>Axially loaded members</td>
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<td>Week 4</td>
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<td>Week 5</td>
<td>Pure Bending, flexure formula</td>
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<td>Week 6</td>
<td>SFD, BMD, unsymmetric bending</td>
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<td>Week 7</td>
<td>Shear formula, shear flow, combined loading</td>
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<td>Week 9</td>
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<td>Week 10</td>
<td>Stress transformation, principal stresses</td>
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<td>Week 11</td>
<td>Stress transformation, Mohr’s circle</td>
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<td>Week 12</td>
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<td>May 9 (1:15-3:00 pm): Final exam</td>
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UTRGV Policy Statements

**STUDENTS WITH DISABILITIES:**
Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive academic accommodations should contact **Student Accessibility Services**
(SAS) as soon as possible to schedule an appointment to initiate services. Accommodations can be arranged through SAS at any time, but are not retroactive. Students who suffer a broken bone, severe injury or undergo surgery during the semester are eligible for temporary services.

**Pregnancy, Pregnancy-related, and Parenting Accommodations**
Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Accessibility Services for additional information and to request accommodations.

**Student Accessibility Services:**
**Brownsville Campus:** Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at ability@utrgv.edu. **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at ability@utrgv.edu.

**MANDATORY COURSE EVALUATION PERIOD:**
Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available on or about:

- Module 1: February 13 – 19
- Module 2: April 10 – 16
- Full Fall Semester: April 10 – May 1

**ATTENDANCE:**
Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV's attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

**SCHOLASTIC INTEGRITY:**
As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism (including self-plagiarism), and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

**SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE:**
In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct and discrimination.
COURSE DROPS:
According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the "3-peat rule" and the "6-drop" rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

STUDENT SERVICES:
Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Students Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (888) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor's office hours. University Resources include the Learning Center, Writing Center, Advising Center and Career Center. The centers provide services such as tutoring, writing help, critical thinking, study skills, degree planning, and student employment. Locations are:

- Learning center: BSTUN 2.10 (Brownsville) or ELCTR 100 (Edinburg)
- Writing center: BLIBR 3.206 (Brownsville) or ESTAC 3.119 (Edinburg)
- Advising center: BMAIN 1.400 (Brownsville) or ESWKH 101 (Edinburg)
- Career center: BCRTZ 129 (Brownsville) or ESSBL 2.101 (Edinburg)