ME/AE 5314 Fracture Mechanics in Structure Design
(Spring Semester 2019)
TTh 2:00 - 3:20 pm
Room NH109

Instructor: Prof. Haiying Huang
Office: 315F Woolf Hall
Office Hours: Walk-in Policy; TTh 3:30-4:30 pm
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Course Website: elearn.uta.edu, log in with your UTA ID and password and access through ME 5314-001 on your course list.

Course Prerequisites: Strength of Materials or Solid Mechanics

Textbook: Gdoutos, E.E., Fracture Mechanics: An Introduction, 2nd edition, 2005; other supplemental materials will be handed out at lectures

Learning Objectives: The course is intended to provide engineering students with a clear and thorough presentation of both theory and application of the fundamental principles of fracture mechanics that are used in mechanical design.

Course Content: This course will cover the basic concepts of fracture mechanics for both the linear elastic and elastic-plastic regions. Stress analysis and residual strength evaluation for a cracked structure will be included. Design approach of damage tolerance and durability will be introduced. Prediction of crack growth life for a structure under fatigue loading will also be included. The contents of the course include:

Topic 1: Introduction
Topic 2: Review of solid mechanics and elasticity
Topic 3: Crack-tip stress field
Topic 4: Energy of fracture
Topic 5: Fatigue Crack Growth Analysis
Topic 6: Numerical methods of K determination
Topic 7: Experimental methods
Topic 8: Designing against fracture
Topic 9: Advanced Topics

Attendance Policy: Attendance is strongly encouraged.

Grading Policy:
- Homework assignment 20%  A: 85% and above
- Projects 25%  B: 70% ~ 84%
- Mid term 25%  C: 60% ~ 69%
Final exam 30%
D: 50% ~ 59%
F: 49% and below

Homework: Homework will be collected before the class starts. Any homework submitted after the class starts will be treated as late homework. Late homework will receive a 20% penalty per assignment. Special permission for late submission is based on case by case.

**Drop Policy:** Last day to drop is **March 29, 2019**. Refer to the University drop policy for details.

**Americans with Disabilities Act:**
The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal opportunity legislation; reference Public Law 92-112 – The Rehabilitation Act of 1973 as amended. With the passage of federal legislation entitled *Americans with Disabilities Act (ADA)*, pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at www.uta.edu/disability. Also, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364.

**Academic Integrity:**
It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

“Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or 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.” (Regents’ Rules and Regulations, Series 50101, Section 2.2)

**Student Support Services Available:**
The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally or socially should contact the Office of Student Success Programs at (817) 272-6107 for more information and appropriate referrals.