

**ME 760 - Fatigue and Fracture**  
**Coordinator - Dr. J. Chaudhuri**

**Credit:** 3

**Textbook (required):** Fracture Mechanics Fundamental and Applications, T. L. Anderson,

**References:** Elementary Engineering Fracture Mechanics, David Broek

**Goals:** This course discusses microscopic and macroscopic aspects of fracture mechanics. The objective of this course is to make students knowledgeable about the fracture mechanics and damage tolerance approach of design which describes the relationship between material toughness, design stress and allowable flaw size. The application of this approach in the analysis of certain mechanical responses of solids will be illustrated with the hope that students can explain a particular set of data or give reasoning for a service failure.

**Notes:**

1. Homework problems will assigned during the course. Instead of collecting the HW, a quiz will be given in class whenever the HW is due.
2. This course will be taught in a combination of lecture and group discussion of problems. This will aid a better understanding and retention of the subject matter.
3. Reading assignments include the text + course notes + handouts.
4. Incomplete (I) grades will not be given (except for medical reasons).
5. A written group project on a subject related to fracture mechanics (selected by the students and approved by the instructor) and presentation of that project in class is required.

6. Grading:

QUIZ	20
TESTS (3)	60
PROJECT	20

7. Final Grade:

Over/or 90%	A
less than 90% but over/or 80%	B
less than 80% but over/or 70%	C
less than 70%	F

## 8. Office Hours

T and W 2:00 - 3:00 PM ([E-mail:chaudhur@me.twsu.edu](mailto:chaudhur@me.twsu.edu) , Tel: (316) 978-6368, Fax: (316) 978-3853)

## Syllabus

Class #	Date	Topic	Chapt.	Assignment
1	08/21	Introduction	1	
2	08/23	A @	1	HW 1
3.	08/28	Linear Elastic Fracture Mechanics	2	
4	08/30	A @ A @	2	HW 2
5.	09/04	A @ A @	2	
1	09/06	“ “ “ “	2	
6.	09/11	A @ A @	2	HW 3
7.	09/13	Fracture mechanism in Metals	5	
8.	09/18	Review		
9.	09/20	Test I on Chapters 1 and 2		
10.	09/25	Fracture Mechanism in Nonmetals	6	HW 4, Project Proposal due
11.	09/27	Fracture Toughness Testing of Metals	7	
12.	10/02	A @ A @ A	7	HW 5
13.	10/04	Fracture Toughness Testing of Nonm	8	
14.	10/09	A @ A @ A	8	HW 6
15.	10/11	Review		
16.	10/18	Test II on Chapters 5, 6, 7 and 8		
17.	10/18	Fatigue Crack Propagation	10	
18.	10/23	A @ A	10	HW 7
19.	10/25	“ “ “	10	
20.	10/30	A @ A	10	HW 8, Project due
21.	11/1	Presentation of Projects		
22.	11/6	“ “ “		
23.	11/8	A @ A		
24.	11/13	Handout on Practical Problems		
25.	11/15	“ “ “ “		HW 9
26.	11/20	Handout on Fracture of Structures		
27.	11/27	“ “ “		HW 10
28.	11/29	Review		
29.	12/04	Test III on Chapters 10 and Handouts		
30.	12/06	Test IV (make up test, optional)		