

	National University of Sciences and Technology	
	Course Description	
Course Title Fracture Mechanics	Course Code ME 834	Credit Hours 3 – 0

Textbook:

- David Broek, Elementary Engineering Fracture Mechanics, 4th ed, Martinus Nijhoff Pub.

Reference books:

- C. R. Brooks, A. Choudhury Failure Analysis of Engineering Materials, The McGraw-Hill Companies.
- Van Dierck, Fr. Gechette, Failure Analysis of Brittle Materials, The American Ceramic Society.
- T. L. Anderson, Fracture Mechanics: Fundamentals and Applications, CRC Press.

Course Objective:

- Equip students with a deep understanding of the principles and methodologies in fracture mechanics to predict, analyze, and mitigate failure in materials and structural components.

Course Outline:

- Basic problems and concepts, Mechanisms of fracture and crack growth.
- The elastic crack-tip stress field, the crack tip plastic zone, The energy principle, Dynamics and crack arrest, Plane strain fracture toughness, Plane stress and transitional behavior, Elastic-plastic fracture, Fatigue crack propagation, Fracture resistance of materials, Fail-safety and damage tolerance, Determination of stress intensity factors, Practical problems, Fracture of structures, Stiffened-sheet structures, Prediction of fatigue crack growth.

ASSESSMENTS

Description	Percentage Weightage (%)
Assignments	05-10%
Quizzes	10-15%
Mid Semester Exams	30-40%
End Semester Exam	40-50%