

Course Number: 28593

Course Name: Fracture, Fatigue and Creep

Course Type: Theory
Prerequisite:
Level: Graduate
Group: Applied Mechanics

Type & Max Unit: 3
Corequisite:
First Presentation:
Last Edition:

Objectives:

Topics:

Fracture: Ductile and Brittle Fracture, Fractography
 Creep and Stress relaxation
 Fatigue design methods: Infinite-life design , Safe-life design, Fail-safe design,
 Damage-tolerant design
 Macro/ Micro aspects of fatigue of metals
 Fatigue tests and standards
 Stress-life (S-N) approach
 Cyclic deformation
 Strain-life (ϵ -N) approach
 Fundamentals of LEFM and applications to fatigue crack growth
 Notches and their effects
 Fatigue from variable loading
 Multiaxial Fatigue
 Residual stresses
 Fatigue life improvement

References:

Metal Fatigue in Engineering, 2nd Ed., R. I. Stephens, A. Fatemi, R. R. Stephens, H. O. Fuchs, 2001, John Wiley
 ASM Handbook, Vol. 19, Fatigue and Fracture
 Mechanical Metallurgy, G. E. Dieter, 3rd Ed., 1987, McGraw Hill