

REFERENC BOOKS:

1. **Theory and Practice of Lubrication for Engineers**, Fuller, D., New York company 1998
2. **Principles and Applications of Tribology**, Moore, Pergamon press 1998
3. **Tribology in Industries**, Srivastava S., S Chand and Company limited, Delhi 2002
4. **Lubrication of bearings – Theoretical Principles and Design**, Redzimonvskay E I., Oxford press company 2000

FRACTURE MECHANICS

Subject Code	: 10ME832	IA Marks	: 25
Hours/Week	: 04	Exam Hours	: 03
Total Hours	: 52	Exam Marks	: 100

PART – A**UNIT - 1**

Fracture Mechanics Principles: Introduction, Mechanisms of Fracture, a crack in structure, the Griffith's criterion, modern design – strengths, stiffness and toughness. Stress intensity approach

06 Hours**UNIT - 2**

Stress Analysis For Members With Cracks: Linear elastic fracture mechanics, Crack tip stress and deformations, Relation between stress intensity factor and fracture toughness, Stress intensity based solutions. Crack tip plastic zone estimation, Plane stress and plane strain concepts. The Dugdale approach, the thickness effect.

07 Hours**UNIT - 3**

Elastic – Plastic Fracture Mechanics: Introduction, Elasto–plastic factor criteria, crack resistance curve, J-integral, Crack opening displacement, crack tip opening displacement. Importance of R-curve in fracture mechanics, experimental determination of J-integral, COD and CTOD.

07 Hours

UNIT - 4

Dynamic And Crack Arrest: Introduction, the dynamic stress intensity and elastic energy release rate, crack branching, the principles of crack arrest, the dynamic fracture toughness.

06 Hours

PART – B

UNIT - 5

Fatigue And Fatigue Crack Growth Rate: Fatigue loading, various stages of crack propagation, the load spectrum, approximation of the stress spectrum, the crack growth integration, fatigue crack growth laws.

07 Hours

UNIT - 6

Fracture Resistance Of Materials: Fracture criteria, fatigue cracking criteria, effect of alloying and second phase particles, effect of processing and anisotropy, effect of temperature, closure.

06 Hours

UNIT - 7

Computational Fracture Mechanics: Overview of numerical methods, traditional methods in computational fracture mechanics – stress and displacement marching, elemental crack advance, virtual crack extension, the energy domain integral, finite element implementation. Limitations of numerical fracture analysis.

07 Hours

UNIT - 8

Fracture Toughness Testing Of Metals: Specimen size requirements, various test procedures, effects of temperature, loading rate and plate thickness on fracture toughness. Fracture testing in shear modes, fatigue testing, NDT methods.

06 Hours

TEXT BOOKS:

1. **Introduction to Fracture Mechanics**, Karen Hellan McGraw Hill Pub.2000
2. **Fracture of Engineering Brittle Materials**, Jayatilake, Applied Science, London. 2001.

REFERENCE BOOKS:

1. **Fracture Mechanics – Fundamentals and Application**, T.L. Anderson, CRC press 1998
2. **Elementary Engineering Fracture Mechanics**, David Broek, Artinus Nijhoff, London 1999.
3. **Fracture and Fatigue Control in Structures**, Rolfe and Barsom, Printice Hall 2000.
4. **Fundamentals of Fracture Mechanics**, Knott, Bureworth 2000.

POWER PLANT ENGINEERING

Subject Code	: 10ME833	IA Marks	: 25
Hours/Week	: 04	Exam Hours	: 03
Total Hours	: 52	Exam Marks	: 100

PART – A**UNIT - 1****Steam Power Plant:**

Different types of fuels used for steam generation, Equipment for burning coal in lump form, stokers, different types, Oil burners, Advantages and Disadvantages of using pulverised fuel, Equipment for preparation and burning of pulverised coal, unit system and bin system. Pulverised fuel furnaces, cyclone furnace.

7 Hours**UNIT - 2****Coal, Ash Handling and Different Types of Boilers :**

Coal and Ash handling, Generation of steam using forced circulation, high and supercritical pressures, A brief account of LaMount, Benson, Velox, Schmidt, Loeffler and Ramson steam generators.

6 Hours**UNIT - 3****Chimneys, Accessories for the Steam Generator Cooling Towers And Ponds:**

Natural, forced, induced and balanced draft, Calculations involving height of chimney to produce a given draft. Accessories For The Steam Generator such