



Satuan Acara Pengajaran

ENMT801104 - Mekanika Material

Pengajar

Ir. Rahmat Saptono M.Sc.Tech., Ph.D.

Tujuan Perkuliahan

Mahasiswa mampu menjelaskan teori dasar perilaku mekanika bahan dan mengaplikasikan metode rekayasa analisis dan prediktif pada desain, pemilihan, dan pengujian material untuk mencegah kegagalan karena deformasi, patah, dan lelah.

Minggu 1

Materi Introduction
- Types of Materials Failure
- Technological Challenge and Economic of Fracture
- Materials Selection for Engineering Component

Media - LCD Projector
- White Board

Referensi Norman E. Dowling, Mechanical Behavior of Materials, Engineering Methods for Deformation Fracture and Fatigue (NED)
Chapter 1.1,1.2,1.3,1.4,1.5,3.8

Aktivitas

Minggu 2

Materi Mechanical Testing of Materials
- Tension Testing
- Stress Strain Properties
- Trends in Tensile Behavior

Media - LCD Projector
- White Board

Referensi NED Chapter 4.1, 4.2, 4.3, 4.4

Aktivitas - Lecture Talk
- Discussion

Minggu 3

Materi Stress Strain Relationship and Behavior
- Models for Deformation Behavior
- Elastic Deformation

Media - LCD Projector
- White Board

Referensi NED Chapter 5.1, 5.2, 5.3

Aktivitas - Lecture Talk
- Discussion

Minggu 4

Materi States of Stress and Strain
- Plane Stress
- Principal Stress
- Three Dimensional States of Stress
- Stresses on the Octahedral Plane
- Complex States of Strain

Media - LCD Projector
- White Board

Referensi NED Chapter 6.1, 6.2, 6.3, 6.4, 6.5, 6.6

Aktivitas - Lecture Talk
- Discussion

Minggu 5

Materi Yielding and Fracture under Combined Stresses
- General Form of Failure Criteria
- Maximum Normal Stress Fracture Criterion
- Maximum Shear Stress Yield Criterion
- Octahedral Shear Stress Yield Criterion

Media - LCD Projector
- White Board

Referensi NED Chapter 7.1, 7.2, 7.3, 7.4, 7.5, 7.6

Aktivitas - Lecture Talk
- Discussion

Minggu 6

Materi Fracture Mechanics
- Preliminary Discussion
- Mathematical Concepts
- Application of K to Design and Analysis
- Fracture Toughness Values and Trends

Media - LCD Projector
- White Board

Referensi NED Chapter 8.1, 8.2, 8.2, 8.4, 8.5, 8.6

Aktivitas - Lecture Talk
- Group Discussion

Minggu 7

Materi REVIEW (Mid Term Preparation)

Media - LCD Projector
- White Board

Referensi - NED Chapter 1, 4, 6, 7, 8

Aktivitas - Lecture

Minggu 8

Materi MIDTERM TEST

Media

Referensi

Aktivitas

Minggu 9

Materi Fatigue of Materials
 - Definitions and Concepts
 - Sources of Cyclic Loading

Media - LCD Projector
 - White Board

Referensi NED Chapter 9.1, 9.2, 9.3

Aktivitas - Lecture Talks
 - Discussion

Minggu 10

Materi Fatigue Crack Growth
 - Preliminary Discussion
 - Fatigue Crack Growth Rate Testing
 - Effect of R on Fatigue Crack Growth
 - Trends in Fatigue Crack Growth Behavior
 - Life Estimates for Constant Amplitude Loading
 - Design Consideration
 - Environmental Crack Growth

Media - LCD Projector
 - White Board

Referensi NED Chapter 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.8, 11.10

Aktivitas - Lecture Talk
 - Discussion

Minggu 11

Materi Creep and Damping
- Introduction
- Creep Testing
- Physical Mechanism of Creep
- Life Estimates

Media - LCD Projector
- White Board

Referensi NED Chapter 15.1, 15.2, 15.3, 15.4

Aktivitas - Lecture Talk
- Discussion

Minggu 12

Materi Special Topics on Mechanical Behavior of Materials

Media - LCD Projector

Referensi Related Textbooks and Articles

Aktivitas - Group Presentation
- Discussion
- Lecture Talk

Minggu 13

Materi Special Topics of Mechanical Behavior of Materials

Media LCD Projector

Referensi Related Textbooks and Articles

Aktivitas - Group Presentation
- Discussion
- Lecture Talk

Minggu 14

Materi REVIEW (Final Term Preparation)

Media - LCD Projector
- White Board

Referensi NED Chapter 9, 11, 15

Aktivitas - Lecture Talk
- Discussion
