



Satuan Acara Pengajaran

ENMT800006 - Analisa Kerusakan + Lab

Pengajar

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Prof. Dr. Ir. Winarto M.Sc

Tujuan Perkuliahan

Mahasiswa mampu memahami dan menganalisa Teori Kegagalan (failure) berbagai jenis Material dengan Teknik Analisa Kegagalan serta mampu menerapkan beberapa contoh studi kasus FA di lapangan. Selain itu mahasiswa juga dapat mempraktekan metoda pengujian dan menganalisa hasil pengujian material yang rusak/patah di Laboratorium Uji Material .

Minggu 1

Materi INTRODUKSI:
- Penjelasan SAP MK Perpatahan & FA
- Aspek enjiniring Kegagalan & Analisanya
- Sumber/Faktor Kegagalan Material.

Media LCD

Referensi 1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
2. Brooks C R., Metallurgical Failure Analysis

Aktivitas

Minggu 2

Materi TEKNIK ANALISA KEGAGALAN-1
- Tujuan Analisa Kegagalan
- Tahapan dalam Analisa kegagalan
- Uraian Skematis
- Pengumpulan Data
- Pengamatan Awal Patahan
- NDT

Media LCD

Referensi 1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
2. Brooks C R., Metallurgical Failure Analysis

Aktivitas Tatap Muka
Home-Work

Minggu 3

Materi JENIS PERPATAHAN
- Distorsi
- Patah Ulet (Ductile)
- Patah Getas (Brittle)
- Patah Fatik (Fatigue)

STUDI KASUS LANJUTAN (Bahas 2 Contoh Kasus)

Media LCD

Referensi 1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
2. Brooks C R., Metallurgical Failure Analysis

Aktivitas Kuliah Tatap Muka
Tugas kelompok

Minggu 4

Materi JENIS PERPATAHAN
- Distorsi
- Patah Ulet (Ductile)
- Patah Getas (Brittle)
- Patah Fatik (Fatigue)

STUDI KASUS LANJUTAN (Bahas 2 Contoh Kasus)

Media LCD

Referensi Referensi

1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
 2. Brooks C R., Metallurgical Failure Analysis
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Aktivitas Kuliah Tatap Muka
Tugas kelompok

Minggu 5

Materi Sistim Tegangan dan Residual Stress

Media LCD

Referensi 1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
2. Brooks C R., Metallurgical Failure Analysis

Aktivitas Kuliah Tatap Muka
Tugas Kelompok

Minggu 6

Materi Teori Mekanika Perpatahan & Aplikasinya

Media LCD

Referensi 1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
2. Brooks C R., Metallurgical Failure Analysis
3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention?", Metal Handbook, 8th Ed. Vol. 11, ASM, 1992
4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography?" Metal Handbook, 9th Ed. Vol. 12, ASM, 1992

Aktivitas Kuliah Tatap Muka
Tugas Kelompok

Minggu 7

Materi Tolls for Failure Analysis

Media LCD

- Referensi**
1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
 2. Brooks C R., Metallurgical Failure Analysis
 3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention? Metal Handbook, 8th Ed. Vol. 11, ASM, 1992
 4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography", Metal Handbook, 9th Ed. Vol. 12, ASM, 1992
 5. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol. 1
 6. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol . 2
 7. Stuart A. Shiels , "Corrosion, Failure Analysis and Metallography"
 8. Stephens, R.I (Ed), "Case Studies for Fatigue Education" ASTM PCN, STP 1250, 1994
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Aktivitas Kuliah Tatap Muka
Tugas Kelompok

Minggu 8

Materi Perpatahan Akibat Keausan (wear)
STUDI KASUS DI KELAS (Bahas 2 Contoh Kasus)

Media LCD

- Referensi**
1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
 2. Brooks C R., Metallurgical Failure Analysis
 3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention? Metal Handbook, 8th Ed. Vol. 11, ASM, 1992
 4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography", Metal Handbook, 9th Ed. Vol. 12, ASM, 1992
 5. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol. 1
 6. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol . 2
 7. Stuart A. Shiels , "Corrosion, Failure Analysis and Metallography"
 8. Stephens, R.I (Ed), "Case Studies for Fatigue Education" ASTM PCN, STP 1250, 1994
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Aktivitas Kuliah & Diskusi
Tuags Kelompok

Minggu 9

Materi Perpatahan Akibat Kerapuhan (embrittleness)
STUDI KASUS LANJUTAN (Bahas 2 Contoh Kasus)

Media LCD

Referensi

1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
2. Brooks C R., Metallurgical Failure Analysis
3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention? Metal Handbook, 8th Ed. Vol. 11, ASM, 1992
4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography", Metal Handbook, 9th Ed. Vol. 12, ASM, 1992
5. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol. 1
6. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol . 2
7. Stuart A. Shiels , "Corrosion, Failure Analysis and Metallography"
8. Stephens, R.I (Ed), "Case Studies for Fatigue Education" ASTM PCN, STP 1250, 1994

Aktivitas Kuliah & Diskusi
Tugas Kelompok

Minggu 10

Materi Perpatahan Akibat Proses Heat Treatment
STUDI KASUS LANJUTAN (Bahas 2 Contoh Kasus)

Media LCD

- Referensi**
1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
 2. Brooks C R., Metallurgical Failure Analysis
 3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention? Metal Handbook, 8th Ed. Vol. 11, ASM, 1992
 4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography", Metal Handbook, 9th Ed. Vol. 12, ASM, 1992
 5. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol. 1
 6. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol . 2
 7. Stuart A. Shiels , "Corrosion, Failure Analysis and Metallography"
 8. Stephens, R.I (Ed), "Case Studies for Fatigue Education" ASTM PCN, STP 1250, 1994
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Aktivitas Kuliah & Diskusi
Tugas Kelompok

Minggu 11

Materi Perpatahan Akibat Proses Creep
STUDI KASUS LANJUTAN (Bahas 2 Contoh Kasus)

Media LCD

- Referensi**
1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
 2. Brooks C R., Metallurgical Failure Analysis
 3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention? Metal Handbook, 8th Ed. Vol. 11, ASM, 1992
 4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography", Metal Handbook, 9th Ed. Vol. 12, ASM, 1992
 5. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol. 1
 6. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol . 2
 7. Stuart A. Shiels , "Corrosion, Failure Analysis and Metallography"
 8. Stephens, R.I (Ed), "Case Studies for Fatigue Education" ASTM PCN, STP 1250, 1994
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Aktivitas Kuliah & Diskusi
Tugas Kelompok

Minggu 12

Materi Perpatahan Akibat Tegangan Sisa (Residual Stress)
Studi Kasus & Analisa Permasalahan FA

Media LCD

Referensi

1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988.
2. Brooks C R., Metallurgical Failure Analysis
3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention? Metal Handbook, 8th Ed. Vol. 11, ASM, 1992
4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography", Metal Handbook, 9th Ed. Vol. 12, ASM, 1992
5. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol. 1
6. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol . 2
7. Stuart A. Shiels , "Corrosion, Failure Analysis and Metallography"
8. Stephens, R.I (Ed), "Case Studies for Fatigue Education" ASTM PCN, STP 1250, 1994

Aktivitas Kuliah & Diskusi
Tugas Kelompok

Minggu 13

Materi Studi Kasus & Pembahasan Permasalahan FA

Media LCD

Referensi	<ol style="list-style-type: none"> 1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988. 2. Brooks C R., Metallurgical Failure Analysis 3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention? Metal Handbook, 8th Ed. Vol. 11, ASM, 1992 4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography", Metal Handbook, 9th Ed. Vol. 12, ASM, 1992 5. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol. 1 6. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol . 2 7. Stuart A. Shiels , "Corrosion, Failure Analysis and Metallography" 8. Stephens, R.I (Ed), "Case Studies for Fatigue Education" ASTM PCN, STP 1250, 1994
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Aktivitas	<p>Kuliah & Diskusi Tugas Kelompok</p>
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Minggu 14

Materi	PRESENTASI TIAP GROUP
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Media	LCD
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Referensi	<ol style="list-style-type: none"> 1. Wulpi, D.J., "Understanding How Components Fail?", ASM, 1988. 2. Brooks C R., Metallurgical Failure Analysis 3. Boyer, H.E.(Ed.), "Failures Analysis & Prevention? Metal Handbook, 8th Ed. Vol. 11, ASM, 1992 4. Fellows, J.A.(Ed.), "Fractography & Atlas Fractography", Metal Handbook, 9th Ed. Vol. 12, ASM, 1992 5. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol. 1 6. Khlefa A. Esaklul , "Hand Book Of Case Histories In Failure Analysis" Vol . 2 7. Stuart A. Shiels , "Corrosion, Failure Analysis and Metallography" 8. Stephens, R.I (Ed), "Case Studies for Fatigue Education" ASTM PCN, STP 1250, 1994
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Aktivitas	<p>Kuliah & Diskusi Tugas Kelompok</p>
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Minggu 15

Materi Final Examination (UAS)

Media Paper

Referensi

Aktivitas UAS
