



Satuan Acara Pengajaran

ENMT803114 - Metalurgi Las

Pengajar

Prof. Dr. Ir. Winarto M.Sc

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

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	Kuliah & Diskusi Tugas Kelompok
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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	Kuliah & Diskusi Tugas Kelompok
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Minggu 15

Materi Final Examination (UAS)

Media Paper

Referensi

Aktivitas UAS
