



Satuan Acara Pengajaran

ENMT801002 - Material Teknik

Pengajar

Ir Amin Suhadi M.Eng., Ph.D.

Tujuan Perkuliahan

Mahasiswa mampu menjelaskan teori dasar material dan menganalisa sifat-sifat mekanik dan fisik serta aplikasinya di industri termasuk juga aspek teknologi dan pemilihan material Mahasiswa mampu menelorkan ide untuk mengembangkan inovasi di bidang material untuk menghasilkan material baru atau modifikasi material serta berkontribusi kepada perkembangan ilmu pengetahuan

Minggu 1

Materi	introduction, strategy of learning materials science the role of materials in technology development atomic structure and configuration
Media	LCD Projector
Referensi	Robert W Cahn and Peter . Hasen, Physical Metallurgy, Fourth, Revised Enhanced Edition, Vol. I, 1996 Askeland D.R, Phule P.P, THE SCIENCE AND ENGINEERING OF MATERIALS, Thompson, 2006
Aktivitas	lecture discussion problem solving assignment determination

Minggu 2

Materi atomic bonding
bonding system and effect to the properties of materials
crystal structure

Media LCD projector

Referensi Robert W Cahn and Peter . Hasen, Physical Metallurgy, Fourth, Revised
Enhanced Edition, Vol. I, 1996
Askeland D.R, Phule P.P, THE SCIENCE AND ENGINEERING OF
MATERIALS, Thompson, 2006

Aktivitas lecture
discussion
problem solving
assignment presentation

Minggu 3

Materi micro structure and the role of microstructure on determining material
characteristics

Media LCD Projector

Referensi Askeland D.R, Phule P.P, THE SCIENCE AND ENGINEERING OF
MATERIALS, Thompson, 2006
Dieter GE, Mechanical Metallurgy

Aktivitas lecture
discussion
problem solving

Minggu 4

Materi material selection
ferrous
gray cast iron
white cast iron
malleable iron
ductile iron
austenitic ductile iron

Media LCD projector

Referensi Ashby M.F., MATERIALS SELECTION IN MECHANICAL DESIGN,
Butterworth, oxford, 2000
ASM Metals Hand book vol.1, PROPERTIES AND SELECTION: iron, Steel
and High performance Alloy

Aktivitas lecture
discussion
problem solving

Minggu 5

Materi classification of steel
steel code number
specification of steel

Media LCD projector

Referensi Ashby M.F., MATERIALS SELECTION IN MECHANICAL DESIGN,
Butterworth, oxford, 2000
ASM Metals Hand book vol.1, PROPERTIES AND SELECTION: iron, Steel
and High performance Alloy

Aktivitas Lecture
discussion
problem solving

Minggu 6

Materi carbon steel
low carbon steel
high carbon steel
heat treatable carbon steel

Media LCD Projector

Referensi Ashby M.F., MATERIALS SELECTION IN MECHANICAL DESIGN,
Butterworth, oxford, 2000
ASM Metals Hand book vol.1, PROPERTIES AND SELECTION: iron, Steel
and High performance Alloy

Aktivitas Lecture
Discussion
problem solving

Minggu 7

Materi low alloy steel
high alloy steel
tool steel

Media LCD Projector

Referensi Ashby M.F., MATERIALS SELECTION IN MECHANICAL DESIGN,
Butterworth, oxford, 2000
ASM Metals Hand book vol.1, PROPERTIES AND SELECTION: iron, Steel
and High performance Alloy

Aktivitas Lecture
discussion
problem solving

Minggu 8

Materi Ujian Tengah Semester UTS

Media Laptop
kertas ujian

Referensi lecture materials and reference book

Aktivitas problem solving
quiz

Minggu 9

Materi stainless steel selection
austenitic SS
Ferritic SS
Duplex SS
HP modified

Media LCD Projector

Referensi ASM Metals Hand book vol.1, PROPERTIES AND SELECTION: iron, Steel
and High performance Alloy
Dieter GE, Mechanical Metallurgy
Ashby M.F., MATERIALS SELECTION IN MECHANICAL DESIGN,
Butterworth, oxford, 2000

Aktivitas Lecture
discussion
problem solving

Minggu 10

Materi material selection non ferrous
aluminium alloy
copper alloy
nickel alloy
chromium alloy

Media LCD projector

Referensi ASM Metals Hand book vol.2, PROPERTIES AND SELECTION: Non Ferrous Alloy and Special Purpose Material
Askeland D.R,Phule P.P, THE SCIENCE AND ENGINEERING OF MATERIALS, Thompson, 2006
Dieter GE, Mechanical Metallurgy

Aktivitas lecture
discussion
problem solving

Minggu 11

Materi advance material
shape memory alloy
bio degradable material

Media LCD projector

Referensi Callister, W.D., Materials Science and Engineering:An Introduction, 6th ed., John Wiley & Sons, 1998
Journal of advanced Material
Journal of Material Science

Aktivitas lecture
problem solving
discussion

Minggu 12

Materi engineering ceramic
 properties of ceramic
 advantage and disadvantage

Media LCD Projector

Referensi Callister, W.D., Materials Science and Engineering:An Introduction, 6th ed.,
 John Wiley & Sons, 1998
 Dieter GE, Mechanical Metallurgy

Aktivitas lecture
 discussion
 quiz

Minggu 13

Materi engineering polymer
 structure and properties of engineering polymer

Media LCD Projectore

Referensi Askeland D.R,Phule P.P, THE SCIENCE AND ENGINEERING OF
 MATERIALS, TCallister, W.D., Materials Science and Engineering:An
 Introduction, 6th ed., John Wiley & Sons, 1998
 hompson, 2006

Aktivitas Lecture
 discussion
 problem solving

Minggu 14

Materi development of composite materials
 properties of composite
 role of composite in engineering development

Media LCD projector

Referensi Callister, W.D., Materials Science and Engineering:An Introduction, 6th ed.,
 John Wiley & Sons, 1998
 Journal of advanced Material
 Journal of Material Science

Aktivitas lecture
 discussion
 problem solving

Minggu 15

Materi cellular material
 the role of cellular material in engineering problem
 properties of cellular material
 development of cellular material

Media LCD Projector

Referensi Callister, W.D., Materials Science and Engineering:An Introduction, 6th ed.,
 John Wiley & Sons, 1998
 Journal of advanced Material
 Journal of Material Science

Aktivitas Lecture
 discussion
 problem solving

Minggu 16

Materi Ujian Akhir Semester UAS

Media laptop
 testing paper

Referensi all of lectures materials and reference

Aktivitas testing
