



Satuan Acara Pengajaran

ENMT801002 - Material Teknik

Pengajar

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Tujuan Perkuliahan

mahasiswa diharapkan memahami tentang dasar filosofi material sehingga mampu mengatasi setiap persoalan tentang material di segala bidang industry dan pertambangan serta mampu untuk membuat inovasi tentang perkembangan material baru dalam rangka menunjang kemajuan teknologi

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
effect of crystal structure on properties

Media LCD projector
white board

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 crystal defect and its effect on properties
micro structure and the role of microstructure on determining material
characteristics

Media LCD Projector
white board

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

Aktivitas lecture
discussion problem solving
assignment presentation

Minggu 4

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

Media LCD projector
white board

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
presentation of assignment

Minggu 5

Materi classification of steel
steel code number
specification of steel
characteristics of special steel

Media LCD projector
white board

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
presentation of assignment

Minggu 6

Materi carbon steel
low carbon steel
high carbon steel
characteristics of carbon steel

Media LCD Projector
white board

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
assignment presentation

Minggu 7

Materi low alloy steel
high alloy steel
tool steel
characteristic of alloy steel

Media LCD Projector
white board

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
presentation of assignment

Minggu 8

Materi Ujian Tengah Semester UTS

Media Laptop
kertas ujian
alat tulis

Referensi lecture materials
reference book
journal

Aktivitas problem solving
quiz on academic knowledge

Minggu 9

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

Media LCD Projector
white board

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
presentation of assignment

Minggu 10

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

Media LCD projector
white board

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
presentation of assignment

Minggu 11

Materi advance material
shape memory alloy
bio degradable material

Media LCD projector
white board

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
assignment presentation

Minggu 12

Materi engineering ceramic
properties of ceramic
advantage and disadvantage

Media LCD Projector
white board

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

Aktivitas lecture
discussion
quiz
assignment presentation

Minggu 13

Materi engineering polymer
structure and properties of engineering polymer
application of polymer

Media LCD Projector
white board

Referensi Askeland D.R, Phule P.P, THE SCIENCE AND ENGINEERING OF MATERIALS, T Callister, W.D., Materials Science and Engineering: An Introduction, 6th ed., John Wiley & Sons, 1998
Journal of polymer

Aktivitas Lecture
discussion
problem solving
assignment presentation

Minggu 14

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

Media LCD projector
white board

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
presentation of assignment

Minggu 15

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

Media LCD Projector
white board

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
 assignment presentation
 discussion
 problem solving

Minggu 16

Materi Ujian Akhir Semester UAS

Media laptop
 testing paper
 alat tulis

Referensi all of lectures materials
 reference book
 journal

Aktivitas testing
