



# Satuan Acara Pengajaran

ENMT800014 - Material Mutakhir

Pengajar

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## Minggu 1

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**Materi**            General introduction to Advanced Materials  
                         - Class information  
                         - Course content  
                         - Grading  
                         - References

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**Media**            LCD and projector

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**Referensi**        1. J.R. Davis, "Heat-Resistant Materials," ASM Specialty Handbook, 1997.  
                         2. J.R. Davis, "Aluminum and Aluminum Alloys," ASM Specialty Handbook, 1993.  
                         3. M.F. Ashby, et al., "Metal Foams: A Design Guide," Butterworth-Heinemann, 2000.  
                         4. J.A. Brydson, "Plastic Materials," Butterworth-Heinemann, 1999.  
                         5. A. J. Moulson and J. M. Herbert, "Electroceramics, Materials, Properties, Applications," John Wiley & Sons, 2003.  
                         6. J.D. Buckley and D.D. Edie, "Carbon-Carbon Materials and Composites," Noyes Publications, 1993.

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## Minggu 2

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**Materi**      Proeprty, characterization, and applications of:  
- Superalloys  
- ODS alloys  
- Other heat ressitant alloys

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**Media**        LCD Projector

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**Referensi**    J.R. Davis, "Heat-Resistant Materials," ASM Specialty Handbook,  
1997.

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### Minggu 3

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**Materi**        Metal alloys for aircraft applications:  
- Aluminium/aluminium alloys  
- Titanium/titanium alloys

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**Media**        LCD Projector

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**Referensi**    1. G.E. Totten and D.S. MacKenzie (Eds), "Handbook of Aluminum,  
Physical Metallurgy and Process," Vol. 1, Marcel Dekker, Inc., New  
York, 2003.  
2. G.E. Totten and D.S. MacKenzie (Eds), "Handbook of Aluminum,  
Alloy Production and Materials Manufacturing", Vol. 2, Marcel Dekker  
Inc., New York, 2003.  
3. A. K. Vasudevan and R.D. Doherty (Eds), Aluminum Alloys, Contemporary  
Research and Applications, Vol. 31, Academic Press, Inc., San Diego (1989)

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### Minggu 4

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**Materi**        Nanocomposites:  
a. Pengantar  
b. Manufacture  
c. Karakterisasi  
d. Applications  
e. Recent development

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**Media**        LCD Projector

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- Referensi**
1. J.D. Buckley and D.D. Edie, "Carbon-Carbon Materials and Composites," Noyes Publications, 1993.
  2. T. Sands, "Designing Nanocomposite Thermoelectric Materials: 21st Century Materials for 20th Century Devices based on 19th Century Phenomena," School of Materials Engineering, Purdue University (2008).
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Minggu 5

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- Materi**
- Metal foams:
- a. Pengantar
  - b. Manufacture
  - c. Karakterisasi
  - d. Aplikasi
  - e. Studi kasus
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**Media** LCD Projector

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**Referensi** M.F. Ashby, et al., "Metal Foams: A Design Guide," Butterworth-Heinemann, 2000.

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Minggu 6

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- Materi**
- Metal foams:
- General introduction
  - Manufacture
  - Characterization
  - Applications
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**Media** LCD Projectors

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**Referensi** M.F. Ashby, et al.: Metal Foams: A Design Guide, Butterworth-Heinemann, 2000.

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Minggu 7

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**Materi** Material Magnet:  
- General Introduction  
- Model and properties  
- Preparation  
- Applications

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**Media** LCD Projectors

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**Referensi** J. Stöhr and H.C. Siegmann: Magnetism From Fundamentals to Nanoscale Dynamics, Springer-Verlag, Heidelberg, 2006.

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## Minggu 8

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**Materi** Midterm

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**Media**

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**Referensi**

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**Aktivitas**

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## Minggu 9

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**Materi** Shape memory alloys:  
- General Introduction  
- Manufacture  
- Characterization  
- Applications

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**Media** LCD Projector

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**Referensi** D.C. Lagoudas (Ed): Shape Memory Alloys Modeling and Engineering Applications, Springer Science, New York, 2008.

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## Minggu 10

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**Materi** Liquid Crystal Polymer:  
- General Introduction  
- Manufacture  
- Applications

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**Media** LCD Projector

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**Referensi**

- D. Coates: Liquid Crystal Polymers, Synthesis, Properties and Applications, Vol. 10, Rapra Technology, UK, 2000
- W.D. Callister: Fundamentals of Materials Science and Engineering, John Wiley & Sons, Inc., 2001.
- G. W. Gray: Proc. Royal Soc. London. Series A, Math. Phys. Sci., Vol. 402, No. 1822 (1985) 1-36

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## Minggu 11

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**Materi**

- Advanced Ceramics
- General Introduction
- Manufacture
- Applications

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**Media**

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**Referensi**

- W.D. Callister: Fundamentals of Materials Science and Engineering, John Wiley & Sons, Inc., 2001.
- M.W. Barsoum, Fundamental of Ceramics, Institute of Physics Publishing, Philadelphia, 2003.
- W.D. Kingery, H.K. Bowen, D.R. Uhlmann, Introduction to Ceramics, 2nd ed., John Wiley & Sons, New York, 1976.

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**Aktivitas** LCD Projector

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## Minggu 12

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**Materi**

- Metallic Glass:
- General Introduction
- Manufacture
- Applications
- Today advancement

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**Media** LCD Projector

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**Referensi**

- Nicholas DeCristofaro: Materials Research Society, MRS Bulletin, Volume 23, Number 5 (1998 ), p. 50 ? 56.
- M. Miller and P. Liaw (Eds): Bulk Metallic Glass, Springer, New York, 2008.

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## Minggu 13

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**Materi**        Biomaterial  
                  - General Introduction  
                  - Material and process  
                  - Applications  
                  - Today advancement

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**Media**         LCD Projector

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**Referensi**    - R. E. Smallman and R. J. Bishop: Modern Physical Metallurgy and Materials Engineering, Science, process, applications 6th. Ed. Butterworth-Heinemann, Oxford, 1999.  
                  - J. Black and G. Hastings: Handbook of Biomaterials Properties, Chapman and Hall, New York, 1998.

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## Minggu 16

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**Materi**        Final examination

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**Media**

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**Referensi**

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