Satuan Acara Pengajaran

ENMT800020 - Teknologi Nano

Pengajar
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Tujuan Perkuliahan

Setelah mengambil kuliah ini mahasiswa diharapkan mendapatkan pemahaman tentang aspek teknologi nano yang multidisiplin sehingga bisa menjelaskan konsep tentang teknologi nano termasuk fenomena material nano, sintesis, karakterisasi, dan aplikasinya

Minggu 1

Materi	Class introduction: - About the class - Rules - Grading - Course content - Group discussion
Media	LCD Projector
Referensi	1. Diamond & Related Materials 19 (2010) 1457-1460 2. Superlattices and Microstructures 45 (2009) 529-534
Aktivitas	Lecture Group discussion

Minggu 2

Materi	General Introduction to Nanotechnology - Definitions - Challenge - Root of nanotechnology - Approaches - Tools
Media	LCD Projector
Referensi	G. Cao: Nanostructures and Nanomaterials, Imperial College Press, London, 2004. C.P. Poole, Jr., and F.J. Owens: Introduction to Nanotechnology, John Wiley & Sons, Inc., 2003. E.L. Wolf, Nanophysics and Nanotechnology, an Introduction to Modern Concepts in Nanoscience, WILEY-VCH Verlag GmbH &Co. KGaA, 2004.
Aktivitas	Lecture

Minggu 3

Materi	Physics of Solids: Crystal Structure - Size dependence of nanostructure - Basic crystallography - Basic nanostructure in SC, BCC, FCC - Ferroelectrics and dielectrics properties - Magnetic properties
Media	LCD Projector
Referensi	B.D. Cullity: Elements of X-ray Diffraction, 2nd ed., Addison-Wesley Publishing Company Inc., Reading, Massachusetts, 1978 C. Hammond: The Basics of Crystallography and Diffraction, 3rd ed., Oxford University Press Inc., New York, 2009. R.J.D. Tilley: Crystals and Crystal Structures, John Wiley & Sons Ltd., Chichester, West Sussex, England, 2006 W.D. Callister, Jr.. Fundamentals of Materials Science and Engineering, John Wiley & Sons, Inc., New York, 2001
Aktivitas	Lecture

Minggu 4

Materi	Physical Chemistry of Solid Surfaces: - Origin of surface energy - Surface energy in FCC - Wulff plot - Exercise
Media	LCD Projector
Referensi	G. Cao: Nanostructures and Nanomaterials, Imperial College Press, London, 2004. C.P. Poole, Jr., and F.J. Owens: Introduction to Nanotechnology, John Wiley & Sons, Inc., 2003. E.L. Wolf, Nanophysics and Nanotechnology, an Introduction to Modern Concepts in Nanoscience, WILEY-VCH Verlag GmbH &Co. KGaA, 2004.
Aktivitas	Lecture Exercise

Minggu 5

Materi	Nanomaterials and Fundamental of Electron Theory: - Approaches in continuum, classical, and quantum theories - The wave-particle duality - The Schrödinger equation - Solution for the Schrödinger equation
Media	LCD Projector
Referensi	C.P. Poole, Jr., and F.J. Owens: Introduction to Nanotechnology, John Wiley & Sons, Inc., 2003. R.E. Hummel: Electronic Properties of Materials, Springer-Verlag New York, Inc., 2001
Aktivitas	Lecture

Minggu 6

Materi	Energy Bands in Solids: - Insulators - Conductors - Semiconductors
Media	LCD Projector

Referensi	C.P. Poole, Jr., and F.J. Owens: Introduction to Nanotechnology, John Wiley & Sons, Inc., 2003. R.E. Hummel: Electronic Properties of Materials, Springer-Verlag New York, Inc., 2001
Aktivitas	Lecture

Minggu 7

Materi	Physical Properties of Nanomaterials - Melting point and lattice constant - Mechanical properties - Optical Properties - Electrical properties - Ferroelectrics and dielectrics properties - Magnetic properties
Media	LCD Projector
Referensi	G. Cao: Nanostructures and Nanomaterials, Imperial College Press, London, 2004. C.P. Poole, Jr., and F.J. Owens: Introduction to Nanotechnology, John Wiley & Sons, Inc., 2003. E.L. Wolf, Nanophysics and Nanotechnology, an Introduction to Modern Concepts in Nanoscience, WILEY-VCH Verlag GmbH &Co. KGaA, 2004.
Aktivitas	Lecture

Minggu 8

Materi	Midterm
Media	
Referensi	
Aktivitas	