Satuan Acara Pengajaran

ENEP802006 - Elektronika Daya Industri

Pengajar
Dr., Ir Ridwan Gunawan M.T

Minggu 1

Materi	Review : Semiconductors Devices, Power Diodes, Bipolar Junction Transistors. Power Mosfets. Thyristors. GTO Thyristors, Insulated Gate Bipolar Transistors.
Media	White Board LCD, laptop
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall, 2014
Aktivitas	Kuliah, presentasi dan diskusi

Minggu 2

Materi	Line-Frequency Diode Rectifiers : Line frequency ac to undercontrolled dc Konsep dasar penyearah, Diode penyearah jembatan phasa tunggal. Voltage Doubler Rectifiers. Efek penyearah phasa tunggal pada arus netral sistem 3 phasa 4 kawat. Penyearah jembatan penuh sistem 3 phasa.. Perbandingan penyerah phasa tunggal dan 3 phasa. Arus Inrush dan tegangan lebih saat turn-On.
Media	WB, LCD dan Laptop
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014

Aktivitas	Kuliah, diskusi presentasi

Minggu 3

Materi	Line-Frequency Phase Controlled Rectifier and Inverter, ac to controlled dc : Rangkaian Thyristor dan kendali, converter phasa tunggal dan tiga phasa. Converter dengan pensaklaran dc-dc , Buck (step down) converter, Boost (step Up) converter, Cuk dc-dc converter. Full Bridge dc-dc converter. Perbandingan dc-dc converter
Media	LCD. Laptop dan WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah presentasi, tanya jawab

Minggu 4

Materi	Innverter dengan pensaklaran dc-ac, dc to sinusoidal ac. Konsep dasar pensaklaran Inverter. Inverter phasa tunggal dan tiga phasa. Effect waktu blanking pada tegangan Output dalam PWM inverter.
Media	LCD, Laptop, WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah , Presentasi diskusi, tanyajawab

Minggu 5

Materi	Resonant Converters : Pensaklaran Zero Voltage and/or Zero Current . Klasifikasi resonansi pada converter. Konsep dasar resonant Circuit., Load Resonant Converter. resonant switch converter, Zero voltage switching Clamped-voltage Topologies. resonant-dc-link Inverterwith zero voltage switchings High-Frequency-Link Integral-Half-Cycle Converters.
Media	LCD, Laptop, WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah, presentasi, diskusi, tanya jawab.

Minggu 6

Materi	Penggunaan Power Supply Linear Power Supply, Overview of switching Power Supplies, dc-dc converter with electrical isolation, Control of switch-Mode dc Power Supplies, Power Supply Protection. Electrical Isolation in the feedback Loop Designing to Meet the Power Supply Specifications.
Media	LCD, Laptop, WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah, Presentasi, diskusi

Minggu 7

Materi	Motor Drive Applications DC moptor Drives : Introduction, Equivalent Circuit of DC motor s. Permanent Magnet DC Motor. dc-motor with aseparately Excited Field Winding. Effect of Armature current waveform. dc Servo drives Adjustable-Sepeed dc drives.
Media	LCD, Laptop, WB

Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah, presentasi, diskusi.

Minggu 8

Materi	Ujian Tengah Semester (UTS)
Media	kertas ujian dan soal ujian
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	ujian tulis

Minggu 9

Materi	Induction Motor Drives : Basic Principles IM Operarion, IM Characteristics at rated(line) frequency and rated voltage. Speed control by varyingstator frequency and voltage. Impact of NonsinusoidalExcitation on IM. Variable-Frequency Converter Classifications. Variable-Frequency PWM-VSI Drives, Variable-Frequency Square-Wave VSI Driives, Variable-Frequency CSI Drives
Media	LCD, Laptop, WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah, Presentasi, diskusi

Minggu 10

Materi	IM Drives (lanjut) : Comparisonof Varible-Frequency Drives, Line-Frequency Variable-Voltage Drives. Reduced Voltage-Starting ("Soft Start") of IM. Speed Control by Static Slip Power Recovery.
Media	Laptop, LCD, WB.
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah, Presentasi, diskusi, tanya jawab.

Minggu 11

Materi	Synchronous motor drives: Introduction, Basic Principles of SM Operation, Synchronous Servomotor drives with sinusoidal waveforms, Synchronous Servomotor drives with trapezoidal waveforms, Load-Commutated Inverter Drives. Cycloconverter.
Media	Laptop, LCD, WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah, Presentasi, diskusi, Tanya jawab.

Minggu 12

Materi	Synchronous Motor drives : (lanjut) Synchronous Servomotor drives with trapezoidal waveforms, Load-Commutated Inverter Drives. Cycloconverter.
Media	Laptop, LCD, WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014

Aktivitas	Kuliah Presentasi, tanya jawab.

Minggu 13

Materi	Residential Applications, Industrial Applications. High-Voltage dc Transmission, Static var Compensators. Interconnection of Renewable Energy Sources and Energy Storage Systems to the Utility Grid.
Media	Laptop, LCD, WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah, Presentasi, diskusi.

Minggu 14

Materi	Optimizingf the Utility Interface with Power Electronic Systems. Generation of Current Harmonics, Current Harmonic and Power Factor, Harmonic Standards and Recommended Practices , Need for Improve Utility Interface. Improve Single-Phase Utility Interface. Improve Three-Phase Utility Interface. Electromagnetic Interference.
Media	LapTop, LCD, WB
Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	Kuliah, Presentasi, diskusi, tanya-jawab.

Minggu 15

Materi	UJIAN AKHIR SEMESTER (UAS)
Media	Kertas Ujian dan soal ujian

Referensi	1. Power Electronics, Converters, Applications and Design. third Edition , Ned Mohan, Tore M. Undeland, Willam P Robibin. John Wiley 2003. 2. Power Electronics, Circuits, Devices and Applications 4th edition, M H. Rashid , Prentice Hall 2014
Aktivitas	UJian Tulis