

Integral University Lucknow
Study & Evaluation Scheme
B. Tech. (Electrical & Electronics Engg.)

3rd YEAR		SEMESTER-VI						
S. No	Course Code	Subject	Periods			Evaluation		Subject Total
			L	T	P	Sessional	Examination	
THEORY								
1.	IHU-601	Industrial Management	3	1	0	50	100	150
2.	IEN-601	Power Electronics	3	1	0	50	100	150
3.	IEN-602	Power System Analysis	3	1	0	50	100	150
4.	ICS-607	Microprocessors & Microcontrollers	3	1	0	50	100	150
5.	IEC-609	Analog & Digital Communication	3	1	0	50	100	150
6.	IEN-603	Power Distribution & Automation	2	1	0	25	75	100

LABS

1.	IEN-651	Power Electronics Lab	0	0	3	20	30	50
2.	ICS-657	Microprocessors & Microcontrollers Lab	0	0	3	20	30	50
3.	IEC-659	Analog & Digital Communication Lab	0	0	3	20	30	50
4.	IEN-652	Seminar	0	0	3	50	-	50
5.	GP- 601	General Proficiency				50	-	50
Total			12	4	15	465	635	1100

L-Lecture **T**-Tutorial **P**-Practical **CT**-Class Test **TA**-Teacher Assessment

Sessional Total = Class Test + Teacher Assessment

Subject Total = Sessional total + End semester Examination

IHU-601 INDUSTRIAL MANAGEMENT

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UNIT-1

Basic concepts, meaning, nature, significance of management & scientific management, types & function of management, evolution of management thoughts. (6)

UNIT-2

Decision Making-concept, types of decision, significations, process.
Motivation-concept, types of motives, significance, pre-requisites, process, theories. (6)

UNIT-3

Organization- Concept, types, principles, theories.
Re- engineering- Concept, relevance. (6)

UNIT-4

Human Resource Planning- Concept, significance, process, Job analysis, group behavior , performance appraisal, job description. (6)

References:

1. D.H.Holt, Management: Principles & Practices, Prentice Hall of India.
2. C.B. Mamorea , Personnel Management, Himalaya Publishing House.
3. M.C. Shukla, "Business Organization and Management", S Chand & Company.
4. Crier, "Network Re-engineering", Sri Eshwar Enterprise,
5. Koontz & Donnell, "Essentials of Management", Tata Mc Graw Hill.
6. Hellriegel S.Jackson and J.W. Slocun, " Management- a Competency Based Approach", Thomson South Western.

UNIT-1

POWER CONVERTER COMPONENTS: Classification of power transistors: bipolar junction transistor, power MOSFET, insulated gate bipolar transistor, GTO silicon controlled rectifier, basic operation principle of an SCR, V-I characteristics, two transistor analogy, rating of an SCR, turn-on methods of a Thyristor, Thyristor turn-off process, gate characteristic of an SCR, Firing circuits of Thyristor, dynamic characteristics of SCR, series and parallel of SCR, protection of Thyristor. (12)

UNIT-2**CONTROLLED RECTIFIERS:**

Analysis of single phase controlled rectifiers (half wave, full wave and bridge) with different type of load, effect of source impedance on the performance of 1 ϕ full converter, Three phase converters, line commutated inverters, Dual converter, introduction to cycloconverters. (10)

UNIT-3

Principles of inverters, classification of inverters, single phase bridge inverters, series inverters, parallel inverters, Mc-Murray half Bridge Inverters, PWM inverters, switched mode power supplies. (8)

UNIT-4

Principle of choppers, analysis of chopper circuits, multi quadrant choppers, commutation of choppers, DC Jones chopper and Morgan chopper. (8)

UNIT-5

Converter and chopper controlled of DC motors, AC motor speed control, speed control by stator voltage variation, rotor resistance variation and slip energy recovery scheme. (6)

References:

1. Rashid, M.H, Power Electronics, Devices and applications / PHI
2. Jacob, J.M, power Electronics: Principles and applications/ Vikas pub. House Pvt. Ltd.
3. Vedam Subramaniam, power Electronics: devices, Converters, and applications/ New Age Int.(P) ltd.
4. Ned Mohan/ power electronics/ john Wiley

UNIT-1

Modeling of Power system Elements; per unit representation of power system, modeling of synchronous machine, transmission line and line reactors.

Symmetrical Fault Analysis: sudden short circuit of 3-phase alternator at terminals, sub transient, transient and steady state reactance, current limiting reactors, Volt-ampere calculation for 3 phase symmetrical faults, selection of circuit breaker. (8)

UNIT-2

Symmetrical Components: Symmetrical components of unbalanced phasors, phase shift in y-transformer, power in terms of symmetrical components, sequence impedances, sequence networks positive, negative and zero sequence network from synchronous machine and transformer.

Unsymmetrical faults: Single L-G fault, L-L fault, double line to ground fault, interconnection of sequence networks to simulate faults, fault through improvement. (8)

UNIT-3

Power System Stability: Concept of stability, steady state, transient and dynamic stability, swing equation, stability study using equal area criterion and step-by-step method, factors affecting stability and methods of improvement. (8)

UNIT-4

Load flow Study: Formation of Y-bus matrix, classification of buses, development of load flow equation, load flow solution using gauss-seidal and Network-raphson methods. (8)

UNIT-5

Traveling Waves: Standard lightening impulse wave, wave equation, surge impedance, reflection and transmission of traveling wave, repeated reflection and bewley's Lattice, Introduction to power system transient. (8)

References:

1. W.D. Stevenson, elements of power System Analysis, MGH
2. C.L. Wadhwa, Electrical power System, Wiley eastern
3. Ashfaq Hussain / Electrical power system/ CBS
4. S.L. Uppal / Electrical Power / khanna publishers
5. L.P. Singh / Advanced Power System analysis And dynamic / Wiely Eastern.
6. Nagrath And Kothari, modern Power System analysis / TMH.

ICS 607- MICROPROCESSORS & MICROCONTROLLERS

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UNIT 1 - Introduction to Microprocessor 8085 :

General Definition of Mini Computers, Microprocessor, Coprocessor, Writing Assembly Language Problems, Assembler Directives, assembly Language Programing, 8-Bit Microprocessor: 8085 Microprocessor: Pin Configuration, Internal Architecture, Timing & signals: Control and Status, Interrupt: Hardware and Software Interrupts, Circuit. (8)

UNIT 2 – Microprocessor 8085/8086:

Microprocessor 8085: Machine cycles, Instruction Cycle, Bus Size and signals. Instruction Set of 8085: Addressing Modes, Instruction Format.8085 Programming. Introduction to 8086, pin diagram, architecture, basic instruction/ Scalar and Vector processor. Parallel processor, Digital Signal Processor. (8)

UNIT 3 – I/O Interface:

Interfacing with peripheral devices and memory: I/O addressing -I/O mapped I/O and memory mapped I/O schemes, 8255 (PPI), 8257 (DMA, Controller), 8259 (Interrupt Priority Control), 8253/8254 Programmable timer/counter with modes of operation, Interfacing Serial Communication standers: 8251, USART Interfacing RS-232-ADCIC (0808) (8)

UNIT 4 – Introduction to Micro controllers :

Definition of micro controllers, RISC & ISC micro controller architecture: Introduction Advantages, ARM & SHARC Processors. Embedded System : Introduction ,Application . Keyboard and Display Interface -Closed loop control of servo motor -stepper motor control-washing machine control. (8)

UNIT 5 – 8051 Micro Controller:

Overview of 8051 micro controller, architecture, I/O ports and memory organization, addressing modes and instruction set of 8051, counters and timers, simple programs, applications of micro controllers, interfacing 8051 to LED's puch button, relay's and latch connections. Key board and display interface-closed loop control of servo motor -stepper motor control, washing machine control. (8)

References:

1. Gaonkar, Rmesh S, "Microprocessor architecture, programming and application with 8085", Pen ram International Publishing, 5th Edition.
2. M Rafiquzzaman, "Microprocessors- Theory and Applications", PHI.
3. B. Ram, "Fundamentals of Microprocessor and Microcomputer", Dhanpat Rai Publication, 4th Edition

Unit-1 Elements of communication system and its applications

Amplitude Modulation: Amplitude modulation and detection, Generation of DSB-SC,SSB and vestigial side band modulation, carrier acquisition, AM transmitters and receivers, super hetero dyne receiver, IF amplifiers, AGC circuits, Frequency Division Multiplexing. (10)

Unit-2

Angle Modulation: Basic definitions, Narrow band and wide band frequency modulation, transmission band width of FM signals, Generation and detection of frequency modulation.

Noise: External noise, internal noise, noise calculations, signal to noise ratio, noise AM and FM systems. (9)

Unit-3

Pulse Modulation : Introduction ,sampling process, Analog Pulse Modulation System-Pulse Amplitude Modulation, Pulse Width Modulation, pulse Position Modulation.

Wave Coding Techniques: Discretizatuion in time and amplitude, Quantization process, quantization noise, pulse Code Modulation, Differential Pulse Code Modulation, Delta Modulation, Adaptive Delta Modulation (8)

Unit-4

Digital Modulation Techniques: Type of digital modulation , Waveform for amplitude, frequency and phase shift keying, methods of generation of coherent and non coherent, ASK, FSK and PSK, comparison of above digital techniques. (7)

Unit-5

Time Division Multiplexing: Fundamentals, Electronic Commutator, Bit/byte interleaving, TI carrier system, synchronization and signaling of TI, TDM and PCM hierarchy, synchronization techniques,

Introduction to information theory: Measure of information, Entropy & Information rate, channel capacity, Hartley Shannan Law, Huffman Coding, Shannan Fano Coding(7)

References:

1. B.P Lathi, "Modern Analog & Digital Communication Systems" Oxford University Press.
2. Taub & Shilling, "Communication System: Analog & Digital" Tata Mc Graw Hil.
3. R. P. Singh & S.D. Sapre, "Communication System: Analog & Digital" Tata Mc Graw Hill.

IEN- 603 POWER DISTRIBUTIONS AND AUTOMATION

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Unit-1

Power Distribution Layout: Basic structure of power distribution supply system, Single line diagram, Voltage levels, Classification of distribution system (A.C and D.C), Ring mains interconnected system, Function of feeders and Distributors.

Power Distribution Factors: Load factor, Demand Factor, Diversity Factor, Capacity Factor, Utilization Factor, AT & C Loss. (8)

Unit-2

Sub-Stations: Types of Substation, Substation equipment and its function, Bus bar arrangement, Single busbar systems and duplicate busbar systems, Capacitor bank, earthing practices.

Services: New Connection, Metering (LT and HT), Tariff structures billing collection.(8)

Unit-3

Distribution Lines : Types, Overhead line structure and underground line structure, Line Loss factors, HV and LT cable laying methods, Network survey (OH & UG).

Maintenance: 33KV, 11KV overhead line, Substation equipment, Power transformer and distribution transformer maintenance, Pre monsoon inspection, Safety precautions. (8)

Unit-4

Distribution Automation: Substation automation, Introduction of PLC, Introduction of SCADA, Building energy management system, Introduction to smart grid.

Fire-Fighting: Classification of fire, Fire Extinguishers. (8)

Reference Book:

1. M.V. Deshpandey, "Elements of Power System Design", Tata Mc Graw Hill,
2. Soni, Gupta & Bhatnagar, "A Course in Electrical Power", Dhanpat Rai & Sons.
3. S.L. Uppal, "Electric Power", Khanna Publishers
4. S.N. Singh, "Electric Power Generation, Transmission & Distribution", "PHI