Third Semester

S. No.	Code	Subject	Periods			Evaluation		
			L	T	P	S	ESE	Total
1	IMA 301	Mathematics-III	3	1	0	50	100	150
2	IEE 302	Linear Networks & Systems.	3	1	0	50	100	150
3	IEC 301	Electronics Devices and Circuits	3	1	0	50	100	150
4	IEC 302	Electromagnetic Field Theory	3	1	0	50	100	150
5	IEC 303	Semiconductor Material and Power Devices	3	1	0	50	100	150
6	ICS 305 / IHU301	Cyber Law & Information Security / Disaster Management	2	1	0	25	75	100
7	IHU 303	Human Values & Professional Ethics	3	0	0	-	50	50
8	IEE 351	Network Lab	0	0	3	20	30	50
9	IEC 351	Electronic Circuit Lab	0	0	3	20	30	50
10	IEC 352	Electronic Workshop	0	0	3	20	30	50
11	IEC 353	Electronic Circuit & Simulation Lab	0	0	3	20	30	50
12	GP 103	General Proficiency	·	·	·	50	-	50
		Total	17	6	12	405	695	1100

1. IHU-303 is a compulsory audit course in which passing marks is 50% in ESE and the marks will not be added. It has to be cleared once.

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ACADEMIC COUNCIL
ON........06.62.43......

Forth Semester

S. No.	Code	Subject	Periods			Evaluation		
			L	T	P	S	ESE	Total
1	IEC 401/ IEC 305#	Digital Electronics	3	1	0	50	100	150
2	IEC 402	Signals & Systems	3	1	0	50	100	150
3	IEC 403	Measurement and Instrumentation	3	1	0	50	100	150
4	IMA 404	Programming Concepts and Numerical Computing	3	1	0	50	100	150
✱ 5	IEE 402	Electrical Machine	3	1	0	50	100	150
6	IHU401/ ICS 405	Disaster Management / Cyber Law & Information Security	2	1	0	25	75	100
7	IHU 403*	Human Values & Professional Ethics	3	0	0	-	50	50
8	IEC 451/ IEC 355#	Digital Electronics lab	0	0	3	20	30	50
9	IEC 452	Measurement & Instrumentation lab	0	0	3	20	30	50
10	IEE 451	Electrical machine lab	0	0	3	20	30	50
11	IMA 454	Programming & Numerical Technique lab	0	0	3	20	30	50
12	GP 103	General Proficiency	-	-	-	50	--	50
		Total	17	6	12	405	695	1100

1. # This subject (IEC-401/IEC-305) runs in third semester for Computer Science Engineering & Information Technology students.

2. * This is a compulsory audit course in which passing marks is 50% in ESE and the marks will not be added. It has to be cleared once.

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ON 06/ 07/13

✱ Reference to 19th academic council meeting dt. 06.07.213 item 2(b) (i) & (ii) the code IEE 402 changed to IEN 102

0410 2013

IEC-301 ELECTRONIC DEVICES AND CIRCUITS

L T P
3 1 0

UNIT-I

Diode : PN Junction Diode- application oriented diode characteristics, simple dc circuit applications, space charge and the diode capacitances, switching characteristics.

Special purpose diodes: Tunnel diode, Varactor Diode, Schottkey Diode, Light Emitting Diode, photo voltaic cell. Laser Diode with their working principle and characteristics. (8)

UNIT-II

Bipolar Junction Transistor : Review of Configuration and characteristics of BJT, Early effect, Ebers-Moll Model, charge control model, biasing the BJT for discrete circuit design, Bias compensation, Small signal and low frequency analysis of BJT amplifier, Darlington pair, cascode amplifier, bootstrapping circuits.

Parasitic capacitances & high frequency analysis of BJT amplifiers-CE configuration.

Classification of Amplifiers: Class A,B,C amplifiers, Coupling methods, Audio Amplifiers, Wide band amplifier. Power amplifier. (8)

UNIT-III

MOSFET : Review of device structure, operation & V I characteristic. Ohmic and saturation region equations. Classification of MOS (NMOS, PMOS, CMOS, principle of working and comparison, MOSFET as an amplifier and switch, biasing of MOS amplifier circuit, CS, CG, CD

configuration using NMOS, frequency response of a single stage CS amplifier. MOS internal capacitance and high frequency model (CS configuration only). (8)

UNIT-IV

Feedback Amplifiers: Basic concept of feedback, General Characteristics of negative feedback amplifiers, Classification of feedback, Voltage/Current shunt and series feedback, stability of feedback amplifiers, Multistage Amplifiers, Tuned Amplifier. (8)

UNIT-V

Oscillators & Voltage Regulator

Oscillators; Condition for oscillation, generalized form of oscillator circuit, The phase shift oscillator, Hartley & Colpitt's oscillator. The Wein Bridge oscillator, Crystal oscillator, frequency stability. Regulated Power Supplies: Series/Shunt voltage regulator, Monolithic regulators, SMPS,UPS (block diagram). (8)

Text Book:

1. Millman & Halkias/ Integrated Electronics / McGraw-Hill Education India.

2. Sedra, and Smith,/ Microelectronic Circuits/ Oxford University Press India/ 5th Edition.

3. Diffenderfer Robert/Electronic Devices: Systems and Applications/Cengage Learning.

References:

1. Shilling & Belove/ Electronic Circuit/ McGraw-Hill Education India.

2. Streetman, B.G. Banerjee, Sanjay/ Solid State Electronic Devices/ PHI.

3. Salivahanan, Kumar, Suresh & Vallavraj/ Electronic Devices & Circuits/ McGraw-Hill Education India.

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ON...06/.02/.3.........

IEC-302 ELECTROMAGNETIC FIELD THEORY

L T P
3 1 0

UNIT-I

Introduction to Electromagnetic Fields

Vector Calculus, Co-Ordinate systems, Gradient, Divergence and curl, Gauss Theorem, Stoke's Theorem, Electric Field due to Point Charges, electrostatic Potential, Solution of Laplace and Poisson's equation in one dimension, methods of Images applied to plain boundaries, Electric flux Density, Boundary conditions, Electrostatic Energy. (10)

UNIT-II

Magneto-static Fields

Ampere law of force, Magnetic flux density, Ampere's circuital law, Boundary conditions, Faraday's Law, Energy stored in magnetic fields. (8)

UNIT-III

Time-Varying Fields

Continuity equation, Displacement current, Maxwell's equation, boundary conditions, plane wave equation and its solution in conducting and non conducting media. Phasor notation, phase velocity, group velocity, Depth of penetration, conductors and dielectrics, impedance of conducting medium, Polarization, Reflection and refraction of plane waves at plane boundaries, Poynting vectors, and Poynting theorem. (8)

UNIT-IV

Transmission Lines

Transmission line equations, Characteristic impedance, Distortion-less lines, Input impedance, lossless lines, Open and short circuited lines, Standing wave and reflection losses, Impedance matching, Application of smith chart, Introduction to guided waves. (8)

UNIT-V

Waveguides

Rectangular Waveguide, Circular Waveguide Transverse Electric (TE) and Transverse Magnetic (TM) Modes, Wave Propagation in the Guide, Power Transmission & Attenuation, Waveguide Resonators. (6)

Text Book:

1. M. N. O. Sadiku, "Elements of Electromagnetics", 4th Edition, Oxford University Press. India. (TBS 621.34 SAD/P)

References:

1. Nathan Ida, "Engineering Electromagnetism", Second Edition, Springer India Private Limited. (TBS 621.34 IDA/E)

2. Rakesh Singh Kshetrimayum, "Electromagnetic Field Theory", Cengage Learning India Publication, First Edition, 2012

3. W. H. Hayt and J. A. Buck, "Electromagnetic field theory", Seventh Edition, McGraw Hill Education.

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ON.....06/.02/13......

IEC-303 SEMI CONDUCTING MATERIAL & POWER DEVICES

L T P
3 1 0

UNIT-I

Conductivity of Metals : Free electron theory of metals (explanation of ohm's law, thermal conductivity and thermionic emission).factors affecting the electrical conductivity of metals, Thermal conductivity of metals, mechanism of thermal and electrical conductivity, Thermoelectric effect (Seeback, Peltier and Thomson) and its applications, Elementary approach to super conductivity, London Equation, High Tc Super Conductivity, Properties and applications of high and low resistivity materials. (8)

UNIT-II

Mechanism of Conduction in Semiconductors : Atomic bonding, crystallinity, Structural imperfections, Energy Band theory, Band structure for typical semi conducting materials such as Ge, Si, GaAs, GaAsP, classifications of materials using energy band theory, Semiconducting materials for LED, LASER and GUNN DIODE, Organic semiconductors. Polarization mechanism and dielectric constant, Behavior of polarization under impulse and frequency switching, Dielectric loss, Dielectric strength, Spontaneous polarization, Smart material, Piezoelectricity, introduction to pyroelectricity. (8)

UNIT-III

Power Converter Components ; Silicon controlled rectifier, basic operation, principle of an SCR, V-I Characteristics two transistor analogy, turn on and turn off process of thyristor, gate characteristics of an SCR, firing circuits of thyristor, dynamic characteristics of SCR, series and parallel of SCR, protection of thyristo, thyristor family, GTO, IGBT. (8)

UNIT-IV

Controlled rectifiers ; Analysis of single phase controlled rectifiers (half wave and full wave and bridge)with different types of load, effect of source impedance on performance of single phase full converter, Three phase converters, line commutated inverters, dual converter, introduction to cyclo-converters. (8)

UNIT-V

Inverters & Choppers: Principles of inverters, classification of inverters, single phase bridge inverters, series inverters, parallel inverters, PWM inverters, principle of choppers, analysis of chopper circuits, multi quadrant choppers, commutation of choppers. (8)

Text Book:

1. S.O Kasap/Principles of Electronic Materials & Devices/McGraw-Hill Education India.

2. Rashid, M.H. /Power Electronics, Devices and applications/ PHI.

References:

1. A. J. Dekker/Electrical Engineering Materials/ PHI.

2. C.S Indulkar & S.Thiruvegada/An Introduction Electrical Engineering Materials, S. Chand & Co.

3. Jacob, J.M. /Power Electronics : principles and applications/ Vikas Pub. House Pvt. Ltd.

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ON.......06/..02/13..

CYBER LAW AND INFORMATION SECURITY
ICS-305

L T P
2 1 0

Unit 1

Fundamentals of Cyber Law: Jurisprudence of Cyber Law, Object and Scope of the IT Act 2000, Introduction to Indian Cyber Law, Unicitral Model Law, ISP Guideline. Intellectual property issues and cyber space, Indian perspective, Overview of Intellectual property related legislation in India, Patent, Copy Right, Trademark law, Law related to semiconductor layout & design. [7]

Unit 2

E - Commerce: Security Threats to E - Commerce, Virtual Organization, Business Transactions on Web, E-Governance and EDI, Concepts in Electronics payment systems, E-Cash, Credit/Debit Cards, E- Agreement, Legal recognition of electronic and digital records, E-Commerce Issues of privacy, Wireless Computing- Security challenges in Mobile devices.
Digital Signatures - Technical issues, legal issues, Electronic Records, Digital Contracts, Requirements of Digital Signature System. [8]

Unit 3

Investigation and Ethics: Cyber Crime, Cyber jurisdiction, Cyber crime and evidence act, Treatment of different countries of cyber crime, Ethical issues in data and software privacy, Plagiarism, Pornography, Tampering computer documents, Data privacy and protection, Domain Name System, Software piracy, Issues in ethical hacking.
Internet security treats: Hacking, Cracking, Sneaking, Viruses, Trojan horse, Malicious Code & logic bombs.
Introduction to biometric security and its challenges, Finger prints.
Cyber crime forensic: CASE STUDY in Cyber Crime. [8]

Unit 4

Information security- Information Systems and its Importance, Role of Security in Internet and Web Services, Principles of Information Security, Classification of Threats and attacks, Security Challenges, Security Implication for organizations, Security services - Authentication, Confidentiality, Integrity, Availability and other terms in Information Security, Information Classification and their Roles.
Introduction to Cryptography, Issues in Documents Security, Keys: Public Key, Private Key, Firewalls, Basic Concepts of Network Security, Perimeters of Network protection & Network attack, Need of Intrusion Monitoring and Detection. [8]

References:
1. Harish Chander "Cyber Law and IT Protection", PHI Publication, New Delhi
2. Merkov, Breithaupt," Information Security", Pearson Education
3. "Cyber Law in India" - Farooq Ahmad-Pioneer books.
4. K. K. Singh, Akansha Singh "Information Security and Cyber law", Umesh Publication, Delhi

12

6/7/13

IEE 301 –Linear Network and Systems

L T P
3 1 0

Unit-I

Kirchoff's law, Source transformation, loops variable analysis, node variable analysis and duality.
AC Network theorems: Superposition, Thevenin's, Norton's, Millman, Telegen's and maximum power transfer theorems.
Introduction to continuous time singles and system, Basic continuous time signals, unit, ramp, impulse and gate function. (8)

Unit-II

Transient and steady state analysis for R-L, R-C, RLC circuits, Use of Laplace transform, Initial value and final theorem, Solution of differential equations using lap lace transform Lap lace transform of complex waveforms, and waveform synthesis. Formulation for liner time invariant (LTI) continuous time systems, Time Domain analysis of LTI system using lap lace transforms (transient and steady State). (10)

Unit-III

Concept of poles and zeros, Stability, Frequency response Positive real function:
Definitions and properties, Synthesis of RC, LC and Networks using Cauer's and Foster's first and second form. (7)

Unit-IV

Two port networks, two port parameters, Inter-Conversion of two port Parameters, Network Functions: Driving point and transfer function Interconnections of Two port networks, Recipe Dance, and Symmetry, Ladder Networks, Image impedances, Characteristic impedance, T-pie transformation. (8).

Unit-V

Introduction to graph theory, Definitions, Graphs, Three, Walk, Path, Loop, Co- tree, Cut-set matrices for planer network, loop and nodal analysis. (7)

References:
1. M.E.Van Valkenburg, Network Analysis, PHI
2. J.A.Edminister, Electric Circuits, Schaum Series, PHI
3. W.H. Hayt and Jack.E.Kammerly, Engineering Circuit Analysis, Tata Mc Graw Hill
4. A.Hussain, Network and Systems, Khanna publications

(Mohd Khursheed Siddiqui)
HOD, EED
IU, Lucknow-226026

B.Tech (3rd & 4th Semester) Common to all branches

Human Values & Professional Ethics

Maximum Marks:50

L T P: 3 0 0

6

Unit-1

Human Value Education: Understanding the need, basic guidelines, content and process for value education, self exploration – Its content and process; Natural acceptance' and Experiential Validation- as the mechanism for self exploration, Continuous Happiness and Prosperity- A look at basic Human Aspirations, Right understanding, Relationship and Physical Facilities- the basic requirement for fullfilment of aspirations of every human being with their correct priority, Understanding Happiness and Prosperity correctly

6

Unit-2

Introduction to Ethical Concept: Definition of industrial ethics and values, Ethical rules of industrial worker. Values and Value Judgments. Moral Rights and Moral Rules, Moral character and responsibilities. Privacy, Confidentiality, Intellectual Property and the Law. Ethics as Law.

6

Unit-3

Professional Responsibility: The basis and scope of Professional Responsibility, Profession and Norms of Professional Conduct, Ethical Standards versus Profession, Culpable mistakes, the autonomy of professions and codes of ethics. Employee status and Professionalism. Central Professional Responsibilities of Engineers: The emerging consensus on the Responsibility for safety among engineers, hazards and risks.

6

Unit-4

Engineers Ethics: senses of Engineering Ethics'-variety of moral issues-types of enquiry - moral dilemmas - moral autonomy – Kohlberg's theory – Gilligen's theory – consensus and controversy – Models of Professional Roles – theories about right action – Self-interest – customs and religion – uses of ethical theories. Valuing Time – Co-operation – Commitment.

6

Unit-5

Global Issues: A Glimpse of Life Stories: **Life story of Prophet Mohammad,** Mahatma Gandhi, Swami Vivekanand, Marie Curie and Steve Jobs. Multinational corporations – Environmental ethics – computer ethics – weapons development – engineers as managers – consulting engineers – engineers as expert witnesses and advisors- moral leadership.

Text Books:
1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education.
2. Mike Martin and Ronald Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996
3. Govindarajan M, Natrajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India. New Delhi,2004

Relevant CDs, Movies, Documentaries & Other Literature:
1. Value Education Website, http://www.uptu.ac.in
2. Story of Stuff, http://www.storyof stuff.com
3. Al Gore, An Inconvenient Truth, Paramount Classics, USA
4. Charlie Chaplin, Modern Times, United States, USA
5. IIT Delhi, Modern Technology- The Untold Story
6. The Hundred, Michael Hart

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MATHEMATICS III
IMA - 301

L T P
3 1 0

Unit I: Series Solutions and Special Functions   (8)

Series solutions of ODE of 2nd order with variable co-efficient with special emphasis to differential equations of Legendre and Bessel, Legendre polynomials, Bessel functions and their properties.

Unit II: Integral Transforms   (10)

Fourier integral, Fourier complex transform, Fourier sine and cosine transforms and applications to simple heat transfer equations. Z-transform and its application to solve difference equations.

Unit III: Functions of a Complex Variable-I   (8)

Analytic functions, C-R equations and harmonic functions, Line integral in the complex plane, Cauchy's integral theorem, Cauchy's integral formula for derivatives of analytic functions, Liouville's theorem, Fundamental theorem of Algebra.

Unit IV: Functions of a Complex Variable-II   (9)

Representation of a function by power series, Taylor's and Laurent's series, singularities, zeros and poles, Residue theorem, evaluation of real integrals of type $\int_{0}^{2\pi} f(\cos\theta, \sin\theta)d\theta$ and $\int_{-\infty}^{\infty} f(x)dx$, Conformal mapping and bilinear transformations.

Unit V: Statistics and Probability   (7)

Correlation and Regression, Binomial distribution, Poisson distribution, Normal distribution.

Reference Books:

1. Kreyszig E. (1993)   :   Advanced Engg. Mathematics John Willey & Sons inc.

2. B.S. Grewal   :   Higher Engineering Mathematics, Khanna Pub.

3. Dennis G. Zill   :   Advanced Engineering Mathematics, CBS Pub.

4. I.N. Sneddon   :   Partial Differential Equations, Mc Graw-Hill

5. Paopoulis   :   Signal Analysis 3rd Edition (1988), Mc Graw-Hill

6. I.N. Sneddon   :   Use of integral transforms, Tata Mc Graw-Hill

7. W. Felser   :   Introduction to probability and its Applications. Wiley Eastern Pub.

8. H.K. Dass   :   Advanced Engineering Mathematics, (S. Chand & Company)

IEC-401/IEC-305 DIGITAL ELECTRONICS

L T P
3 1 0

Unit 1

Boolean algebra and number system

Digital system and binary numbers: Signed binary numbers, fixed and floating point numbers, binary codes, cyclic codes, gray codes, error detecting and correcting codes, parity check codes and hamming codes.
Boolean algebra and logic gates: basic definition, axiomatic definition of Boolean algebra, basic theorem and properties of Boolean algebra, Boolean function, canonical and standard forms, other logic operations

(10)

Unit 2

Combinational Logic

Gate-level minimization : K-map, don't care conditions, NAND and NOR implementation, Quine Mc-Clusky method (Tabular method).

Combinational Logic: Combinational circuits, analysis procedure, design procedure, binary adder-subtractor, decimal adder, binary multiplier, magnitude comparator, decoders, encoders, multiplexers, three state devices.

(8)

Unit 3

Sequential Circuits: Latches, Flip Flops, Shift Registers, Counters; Synchronous and asynchronous sequential circuits.

(8)

Unit 4

Asynchronous sequential logic: Analysis procedure, circuit with latches, design procedure, reduction of state and flow table, race Free State assignment, hazards.

(8)

Unit 5

Memory:

ROM : PROM, EPROM & EEPROM,

RAM : SRAM & DRAM,

PLD : PLA, PAL & FPGA

(6)

Text Books:

1. Mano M Morris / Digital Design/ Pearson Education India
2. Mano M Morris / Digital Logic and Computer Design / Pearson Education India
3. G.K.Kharate/Digital Electronics/Oxford University Press India

Reference Books:

1. Gopalan , K. Gopal/Introduction to Digital Microelectronics Circuits/ McGraw-Hill Education India
2. Jacob Millmam and Herbert Taub / Pulse, Digital & switching wave forms/ McGraw-Hill Education India
3. Bignell James/Digital Electronics: Logic and Systems/Cengage Learning

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ON.......06/02/13.....

IEC-402 SIGNALS & SYSTEMS

L T P
3 1 0

Unit 1

Basics of Signals & Systems

Signal Classification, Basic Signals

Signal Operations: transformation of the independent variable, Convolution,

continuous and discrete time system, basic system properties

LTI systems, Characterization of LTI system by differential equation, Impulse response, Step response   (8)

Unit 2

Fourier Transform

Fourier series representation of periodic signal, Fourier Transform, properties, Fourier transform of periodic signals,

Discrete time Fourier transform: representation of non periodic signals, Fourier transform of periodic discrete signals, properties of discrete Fourier transform   (8)

Unit 3

Time and frequency characterization

Magnitude- phase representation of Fourier transform, frequency response of LTI systems, time domain properties of ideal frequency selective filters, time domain and frequency domain aspects of ideal and non-ideal filters, first order and second order continuous and discrete systems   (8)

Unit 4

Sampling : Sampling theorem, ideal sampling, flat top sampling, natural sampling, reconstruction of signals from samples, aliasing effect, up-sampling and down-sampling, discrete time processing of continuous time signals, sampling of band pass signals.   (8)

Unit 5

Z-Transform : Introduction to Z- transform, properties, inverse Z- transform, analysis and characterization of discrete LTI systems, realization of discrete time systems   (8)

Text Book:
1. V Oppenheim, A.S Willsky and S. H Nawab/ Signals and Systems/PHI/Second Edition

References:
1. Haykins/ Signals and Systems/Wiley India
2. H.P.Psu/Signals and Systems Schaums outline/McGraw-Hill Education India
3. Kallappan Gopalan/Signals and Systems/Cengage Learning India/Second Edition

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ON....... 06/.07/3....

IMA-404 PROGRAMMING CONCEPTS & NUMRICAL COMPUTING

L T P
3 1 0

UNIT-I

Programming Concepts : Problem Identification, Problem Definition, Goals and Objectives, Program Design and Implementation Issues: Algorithm, Algorithm generalization, Algorithm representation: flowchart, program, pseudo-code. Program writing using: sequence logic, selection logic, iterative logic, functions. Types of programming languages, Machine level, assembly level, high level, scripting language. (8)

UNIT-II

Programming Language Tools : Programming language tools: Compiler, linker, Interpreter, editor, GUI (Graphic user interface), IDE (integrated development environment). Testing and debugging: difference between testing and debugging, types of program errors, testing a program, debugging a program for syntax error/logic errors. Program documentation: Need for documenting programs and software, system documentation, user manual and comments. (8)

UNIT-III

Solution of Algebraic & Transcendental Equation : Bisection method, Iteration method, False Position method, Newton-Raphson method, Muller's method, Bairstow's method, Order & Rate of Convergence of above method, Solution of linear simultaneous equation by Gauss Siedel method & LU decomposition method, Example with MatLab / C. (8)

UNIT-IV

Finite Difference, Interpolation & Numerical Differentiation : Finite difference, Newton's formula for equal interval, Gauss central difference formula, Lagrange's & Newton's divided difference formula for unequal interval, Numerical differentiation, Example with MatLab / C. (8)

UNIT-V

Numerical Integration & Solution of Ordinary Differential Equation : Numerical Integration using Trapezoidal rule, Simpson's 1/3 & 3/8 rule, Boole's rule & Weddlee's rule, Solution of Ordinary differential equation by Euler's method, Euler's modified method & Runge Kutta 4th order method, Example with MatLab / C. (8)

Text Book:

1. Schilling/Applied Numerical Methods for Engineers using Matlab & C/ Cengage Learing/ First Edition
2. Stephen J. Chapman/MATLAB Programming for Engineers/Cengage Learing/4th Edition.
3. E Balagurusamy/Numerical Methods/McGraw-Hill Education India.
4. S.S.Sastry/Introductory Method of Numerical Analysis/PHI.

References:

1. Kernighan, Ritchie/The C Programming Language/Prentice Hall of India
2. Carlo Ghezi, Mehdi Jazayeri/Programming Language Concepts/Wiley India

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ON........06/.07/.3.....

IEC-403 MEASUREMENT AND INSTRUMENTATION

L T P
3 1 0

UNIT-I

Electronic Instrument Systems : Standards of Measurement of Mass, Length, Volume, Time and Frequency, Electrical Standards, Standards of Temperature and Luminous Intensity, IEEE standards, Engineering Analysis of Instrument Systems, Experimental Errors, Minimization of Errors, Frequency Response and Calibration of Instruments systems.

Transducers: Classification: Displacement, Resistive, Capacitive, Inductive, Piezo-Electric, piezo-Resistive and Photo-Electric Transducers, Crystal Oscillator, Semiconductor Transducers. (8)

UNIT-II

Bridge Measurements: Wheatstone Bridge, Kelvin Bridge, Guarded Wheatstone Bridge, AC Bridges: Maxwell Bridge, Hay Bridge, Schering Bridge, Wien Bridge.

High Frequency Measurements : Problems in High Frequency Measurement, RF Power and Voltage Measurements, RF Impedance Measurement, Q Meter, Digital Voltmeter, Time, Frequency and Phase Measurements, Measurement on CRO, Group Delay Measurement, Digital Storage Oscilloscope. (8)

UNIT-III

Measurement of Non Electrical Quantities: Measurement of Temperature: Resistance Thermometer, Thermocouple, IC Sensor, Radiation Method **(Pyrometer)**

Measurements of Pressure, Fluid Flow, Force, Torque, Displacement, Velocity and Acceleration. (7)

UNIT-IV

Measurement of Amplifier and Receiver Characteristics, Data Distribution and Bus Structure, RS-232, IEEE488 Interface, PC Based Acquisition System, Data Transmission, D to A and A to D convertors, pulse Modulation Techniques, Telemetry, Tracking and Command. (8)

UNIT-V

Signal Generation

Frequency Synthesized Signal Generator, Frequency Divider Generator, Signal Generation Modulation, Sweep Frequency Generator, Pulse and Square wave Generators, Function Generator.

Display Devices, Signal Analyzer, wave Analyzer, Harmonic Distortion Analyzer, Spectrum Analyzer.

Microprocessor Based Instrumentation, Computer Controlled Test System, Fiber Optic Measurements. (9)

Text Book:

1. Helfric & Cooper/ Modern Electronic Instrumentation & Measurement Techniques/ PHI.

References:

1. E.O. Doeblin/ Measurement Systems/ MC Graw Hill.

2. Oliver & J.M. Cage/Electronic Measurement And Instrumentation/ MC Graw Hill.

3. Ranjan C.S./Instrumentation Devices & Systems / Tata MC Graw Hill.

S.H.S.

IEN-402 Electrical Machines (Revised Syllabus)

(For other than EE & EL Branches)

L T P
3 1 0

UNIT-1
D.C.MACHINES
Principle of electromechanical energy conversion, Construction, types of D.C. Machines, EMF equation commutation, Armature reaction, Performance characteristics of D.C Generators & Motors, Starting, Speed control and Breaking of D.C. Motors. (8)

Unit-2
Introduction to solid state control of d.c. motors, losses, Efficiency, Application of D.C.motors.
Transformers: Types of single phase Transformer's Principle operation, Phasor diagram, Equivalent circuit, losses, efficiency and voltage regulation. (8)

Unit-3
Testing of single phase transformers. Autotransformers, Introduction of three phase transformers and three winding transformers.
Induction Machines: types of three phase Induction Motor, Production of rotating magnetic field, Principle of operation. (8)

Unit-4
Equivalent circuit, Torque-slip characteristic, Starters for SCIM & SRIM, Speed control and braking of IM, Applications, Principle of operation of single phase induction motor, Types, Application of single phase IM, Stepper motor. (8)

Unit-5
Synchronous machines
Construction, Principal of operation, EMF equation, Hunting, Methods of starting of synchronous motors, V-curves, Types of synchronous generators, Armature reaction, Determination of regulation of synchronous generator by synchronous impedance method, Method of synchronization, Applications of synchronous machines. (9)

Text Books:
1. Mallick. M.A, Ashraf. I, Electric Machines, I K International Pvt. Ltd, New Delhi.
2. Nagrath &Kothari, Electrical Machines, TMH Publications.

References:
1. Cotton.H.Advanced Electrical Technology, Wheeler & Co,UK.
2. Fitzgerald,Kingsley, Kusko, Dumas-Electrical Machines, TMH Publications.
3. Kosow L , Electrical Machinery & Transformer, TMH Publications.
4. Parker & Smith, Electrical Engg Problem, CBS Publications.

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ACADEMIC COUNCIL
ON......06/.0.11.3.........

M.A-Mallick
(Head, EN Deptt)

HU-301 / HU-401 : DISASTER MANAGEMENT

Compulsory for all B.Tech Courses

L T P
2 1 0

OBJECTIVE : The objective of this course is to familiarize the students with basic management principles relating to disaster management and mitigation techniques.

UNIT - 1

- Concept of Disaster Management
- Types of Disaster and their impact : Natural and Man-made, like – Earthquakes, Floods, Tsunami, Droughts, Cyclones, Avalanches, Forest Fires, Terrorism related disasters etc.
- Assessment of Human and Economic losses

6

UNIT - 2

- Impact of Extensive Industrialization
- Impact of Global Warming and Environmental Degradation
- National and Global Disasters

6

UNIT - 3

- National Policy for Disaster Management, Elementary knowledge of the Disaster Management Act 2005
- Types of Responses : Central, State, District Level, People's Community participation in Disaster Management
- Post-Disaster Management and Rehabilitation measures

6

UNIT - 4

- Capacity Building for meeting disasters
- Long-term measures for prevention of Disasters
- Mitigation techniques / strategies : Early warning systems, Data sharing at National and International level

6

RECOMMENDED BOOKS:

1. Disaster Management by Dr. V. K. Sethi
2. The Great Sumatra earthquake and Indian Ocean Tsunami of December 2004 – the effects in mainland India and in the Andaman & Nicobar Islands published by IIT, Kanpur.
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Note: code is changed to IHU 301/IHU /401 in academic council dated 06.07.13

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