DRIEMS

Syllabus for
Bachelor of Engineering
1st and 2nd Semester
2001-2002
Utkal University

DHANESWAR RATH
INSTITUTE OF ENGINEERING
AND MANAGEMENT STUDIES
MADHUPATNA, (Near OSIC Building)
CUTTACK, ORISSA

COMMON CURRICULUM FOR ALL BRANCHES

FIRST SEMESTER

COURSE NO.	SUBJECT	TOTAL MARKS	DURATION UNIV EXAM	LECTURER HOURS PER WEEK
1	2	3	4	5
THEORY				
MA 101	Mathematics-I	100	3	4
HU 101	English	100	3	4
PH 101	Engineering Physics - I	50	2	2
CY 101	Engineering Chemistry-I	50	2	2
EE 101	Basic Electrical Engg.	100	3	4
CS 101	Introduction to Computer and Information Technology	100	3	4
	Total	**500**		
SESSIONALS				
WS 101	Workshop Practice	50		3
PH 102	Engg. Physics Lab.	50		3
CY 102	Engg. Chemistry Lab.	50		3
CE 101	Engg. Drawings	50		3
	Total	**200**		

SECOND SEMESTER

COURSE NO.	SUBJECT	TOTAL MARKS	DURATION UNIV EXAM	LECTURER HOURS PER WEEK
1	2	3	4	5
THEORY				
MA 201	Mathematics-II	100	3	4
PH 201	Engg. Physics - II	50	2	2
CY 201	Engg. Chemistry-II	50	2	2
EC 201	Basic Electronics	100	3	4
ME 201	Engineering Mechanics	100	3	4
CS 201	Programming Languages	100	3	4
	Total	**500**		
SESSIONALS				
PH 202	Engg. Physics Lab.	50		3
CY 202	Engg. Chemistry Lab.	50		3
ME 201	Engg. Drawing	50		3
CS 202	Computer Lab.	50		3
	Total	**200**		

1ST SEMESTER

MA 101 **MATHEMATICS-1** **F.M- 80**

(Common To All Branches)

Ordinary Differential Equations of the First Order. Separable Equation, Exact Differential Equation, Integrating factors, Linear First Order Differential equation. Variation of Parameters, Families of Curves, Picard's Interaction methods, Existence and Uniqueness of solutions.

Ordinary Linear Differential Equation :

Homogeneous Linear Equations of Second Order. Constant Co-efficient, general solution, Real roots, complex roots, double roots of characteristic equation. Differential Operators, Modelling: Free Oscillation, Existence and uniqueness of solutions Homogeneous Linear Equations of any order with constant co-efficients.

System of Differential Equations : Phase place, Critical Points, Stability.

Power Series solution of differential Equations :

Special Functions :

The Power Series Method, Theoretical basis: Legender's Equation, Legender Polynomial, Extended Power Series method, Indicial Equation.

Bessel's Equations, Bessel's functions of First and Second kinds, Orthogonal Sets of Function, Orthogonality of Legender Polynominal and Bessels functions.

Laplace Transform :

Laplace Transform, Inverse Transform, Linearity, Laplace Transform of Derivatives and Integrals, shifting, unit step Function. Differentiation and Integration of Transforms Convolution Partial Fractions, Periodic Function.

Text Books :

Advanced Engineering Mathematics : Fifth Edition By E. Kreyszig. Chapters 1,2.1-2.10, 3.1-3.3, 4.1-4.7, 4.9 and 5.

HU 101 **ENGLISH** **F.M- 80**

The subject shall consist of one paper carrying 100 marks. The achievement of students in the course shall be assessed both through external (80%) and internal (20%) examination. The question per may comprise five units. The question paper may comprise five units. The productive skills of the candidate shall be given priority in testing. The semester examination shall be of three hours duration.

Objectives

1. The teaching of English shall have basically a functional communivative orientation.
2. All the four language skills such as writing, speaking, reading and listening shall receive attention in that order.
3. It seeks to promate skills of writing various forms, which shall be relevant and purposeful.
4. Speech skills appropriate to common everyday situations and formal quasiors shall receive importance.
5. The programme aims at improving reading skills of various nature changing

the speed and degree of comprehensive.

6. Instead of teaching merely grammatical strucature the communicative nature of grammer shall be focused.

UNIT-1 Writing-1

The candidate shall answer two questions [8+8]

1.1 Developing a topic sentence into a paragraph of about 100 words.

- Identifying the topic sentence
- Identifying paragraph division when three or more paragraphs are given as one paragraph.
- Arranging three or more paragraphs in the right order.
- Arranging more then five sentences into a paragraph with suitable sentence linkers.
- Writing a transition paragraph when the preceding and succeeding paragraph are given.

1.2 Preparation of a short report on a subject of topical reference.

Books prescribed : Oxford guide to writing and speaking English by John Sealy OUP.

UNIT-2 Writing-II

(The candidate shall answer two questions 98 marks for 1.1 and 6 from 2.2)

2.1 Writing an official / business letter an application for a job with a functional curriculum vitae (CV).

2.2 Note-making/summarizing from a given passage.

Books prescribed :

1. On our own by Brekdear J. Carrol Orient Congmen.
2. A millennium guide to writing and speaking English by Chand and B.C. Das, Friends publisher cuttack Ch. 5.

UNIT- 3 Reading

3.1 An anthology of English prose shall be prescribed. Five short answer type questions carrying 2 marks each shall be set. The answer shall be in about 30 words.

Books Prescribed : Mosaic : Modern English prose. Pieces to be studied.

1. On Doing Nothing, J.B. Priestley
2. Arguing Robert Cyad
3. Education and Training of chracter. Richard livingstone
4. The secret of work, Swami Vivekananda.
5. Machines, Geroge Orwell.

3.2 A given prose pasage on scientific / Technical subject shall be set for comprehension. Five questions carrying 2 marks each shall be asked out of which at least one should be of inferential type. (The passage may also be used for 2.2 : Note making).

UNIT-4 Communicative Grammar

A candidate shall answer two questions which shall be largely problem solving in nature. [8+8]

(a) Time, tense and Aspect.
(b) Verbs of states and events.
(c) Statemerits, questions, responses.

(d) Mood, emotions and attitude.

Books prescribed : A communicative grammar of English by Geoffrey Leach and Jan Sartvik Longman.

UNIT-5 Speech skills : The candidate shall answer two questions [8+8]

Listing to spoken utterances with reasonable comprehension and speaking with clarity, fluency and accuracy in common everyday situations and formal occasions.

The basic sounds of English shall be introduced in bare outlines.

Vowels : Long and short vowels : el / X / N

Consonants : /f, v, 0, x, s, z, 3/

Stress including weak forms and intozation (Falling and rising)

(a) To introduce self and others
(b) To ask for information, help, permission etc.
(c) To instruct, command, request, invilerefuse, prohibit, suggest, persuade and promise etc.
(d) To describe objects, processes.
(e) To define, compare, classify, example life and emphasis.
(f) To face an interview.

Some polite formulaic expressions (officers invitations etc.) along with their appropriate responses shall be taught.

Books prescribed :

1. Better English Pronunciation by J.D.O' connor.
2. A millennium guide to writing and speaking English by J. K. Chaad and B.C. Das Friends Publication, Cuttack. C. 4,5,6,7.

PH 101 ENGINEERING PHYSICS-1 F.M.- 40

Heat and Thermodynamics :

1. Deviation of real gas from Ideal behavior, Andrew's Experiment, Vanderwaal's equation of state and critical constants. Thermodynamic Variable and P-V Indicator diagram. Isothermal and Adiabatic processes. Heat-Engines and Refrigeration. Second law of thermo-dynamics, Entropy Enthalpy, Gibb's free energy and Maxwell's relation.
2. Platinum resistance thermometer. Thermo-electric thermometer and optical pyrometer.
3. Conduction of heat through compound media, Radial flow of heat, through cylindrical and spherical conductors.

Elasticity :

4. Elastic constants, Torsion pendulum and it's uses. Bending moment of beam. Cantilever loaded at one end and Cantilever supported at two ends and loaded in the middle. Determination of Young's Modulus by Bending Beam Method.

Wave Optics :

5. Interference of light, Newton's Rings, Determination of wavelength of light and refractive index of medium.
6. Diffraction of light, Fresnel's division of wavefront, diffraction at a

straight edge. Fresnel's half-period zone, Zone plate and its equivalence.

7. Fraunhoffer's diffraction, diffraction grating, its construction and use to find the wavelength of light and grating elements.
8. Maxwell's equation, simple derivation and Interpretation, plane wave solution, polarisation.
9. Sabine's formula for line of reverberation.
10. Free and forced vibration, Damped harmonic motion.
11. Ultrasonic production, appliction and testing.

TEXT BOOK :

1. Engineering Physics : by- R. K. Gaur and S.L. Gupta.
2. A Text of Engineering Physics : by- B.L. Theraja
3. Heat and Themodynamics : by- Chakraborty.

REFERENCE BOOK :

1. Heat and Themodynamics : by- Saha and Srivastava
2. Optics : by- B.K. Mathur

CY 101 ENGINEERING CHEMISTRY-1 F.M-40

1. Electrochemistry : Electrode potential, Expression for electrode potential, Electrochemical cell, EMF of an electrochemical cell, Measurement of EMF, Standard cell, Relationship between EMF & Free energy, Determination of pH, Batteries— Dry cell, Fuel cell, Lead-storage cell. -7 periods
2. Phase Equilibria : Explanation of phase, component & degree of freedom, Sulphur system, Bi-Cd system and steel -4 periods
3. High Polymers— Nomenclature and classification, Addition and condensation polymerization, Copolymerization, Mechanism of free-radical addition polymerization, Thermoplastic and Thermosetting resins, Moulding constituents of plastics, Polymeric materials-polyethylene, PVC, Nylon, Phenolic resins, polyesters, silicone resins, polyurethane and synthetic rubber -6 periods
4. Water Treatment : Hardness of water, Disadvantages of hardwater for steam-generation in boilers, Softening methods- Lime soda process, Ion-exchange process, purification of water for domestic use -6 periods
5. Dyes and Dyeing : Mordant dyes and vatdyes -2 periods

Books recommended :

1. Engineering Chemistry- Jain & Jain
2. Chemistry in Engineering and Technology, Vol-I & Vol-II- Kuriacosc & Rajaram
3. Text Book of Quantitative Analysis- Vogel

Reference Books :

1. Environmental Chemistry- A.K. Dey
2. Polymer Science- Gowarikar
3. Engineering Chemistry- B.K. Sharma Krishna Prakashan Media (P) Ltd. Meerut 1996.
4. Text Book of Pure and Applied Physical Chemistry- M.S. Bhatnagar, Wheeler publishing- A Division of A.H. Wheeler & Co. Ltd., New Delhi, 1999.

EE 101 BASIC ELECTRICAL ENGINEERING F.M-80

1. R,L,C, parameters : Current-Voltage relations
2. DC Network : Network reduction, Star-Delta conversion. Network Solution by branch and loop current method, Principle of Superposition, Growth and decay of current in R-L, R-C circuits.
3. Single phase AC circuits : Single phase EMF generation, average and effective values of sinusoids. Solution of R, L, C series circuits, The j-operator, complex representation of impedances. Phasor diagram, power factor, power in complex notation, Resonance in series R-L-C circuit.
4. Three phase AC Circuits : Three phase EMF generation, Delta and Y-connection, line and phase quantities, Power in a 3-Phase balanced circuit.
5. Amper's circuital law, B-H curve, reluctance, magnetic circuits,- leakage and fringing, mmf, Hysteresis and eddy-current losses, solution of simple magnetic circuit.
6. Transformers : Construction and principle of operation, E.M.F. equation of single phase transformer, single-phase auto transformer.
7. DC Machines : Construction and principle of operation, EMF Equation of DC generator, Principle of operation and speed control of DC Motor.
8. Three-Phase Induction Motor : Construction and principle of operation, slip-torque characteristics.
9. Illumination Engineering : Luminous Flux, Luminous intensity, illumination, brightness, luminous efficiency (Definition only), Working principle of fluoroscent lamp, incandescent filament lamp, hologen lamp, sodium and mercury vapour lamp.
10. Electrical Measuring Instruments : DC PMMC instruments, shunts and multipliers; Multi-meters, Moving iron ammeters and voltmeters, Dynamometer wattmeters, AC Watthour meters.

Text Book :

1. Electrical Science
   - B.R. Gupta & V. Singhal, Wheeler publications
2. Advanced Electrical Technology
   - H. Cotton, Wheeler Publications

Reference Book :

1. Problems in Electrical Engg.
   - N. N. Parker Smith, Asia Publication 10th Edition
2. Electrical Technology
   - E. Hughs, ElBS Publication, 7th Edition.
3. Electrical Technology
   - B. L. Theraja, Part- I, II

INTRODUCTION TO COMPUTER AND INFORMATION TECHNOLOGY

CS 101 **F.M- 80**

Information Processing Concept : Data, Information, Evolution of Information Processing and Problem Solving.

Hardware : Elements of Computer systems, Concept of bits and bytes, CPU, Storage

devices and media, VDU, Input-Output Devices, Bus structure and its functions, Data Communication and Multi media equipment.

Software : System Software, Application Software

Programing Language : Classifications- System Programs, Application Programs, Low Level, High Level and Fourth Generation Languages.

Operating Systems : Operating System as Resource Manager, Concept of Priorities, Protection and Parallelism, Command Interpreter, Typical command of DOS/ WINDOWS/UNIX/Netware.

Introduction to Word processing and spread sheet software such as MS-Office.

Computer and Communication : Single user, Multi user, Multi Processing, Time sharing, Computer Networks- LAN, WAN, Concept of Network protocols, Clients Server Systems, Introduction to E-mail, Internet and WWW applications.

Computer Application : Scientific, Business, Educational, Industries, Remote sensing, Multi Lingual and Multimedia applications.

Personal Social and Ethical Issues : Concept of Computer Privacy and Security, Risks and Liability of computing. Computer viruses and Electronic crime, Professional ethics- Team solutions of problems, Intellectual properties.

Text Books :

1. Information Technology, Dannis P. Curtin, Kim Foley, Kunal Sen, Carthleen Moon, Tata Mc Graw-Hill.
2. Donaid H. Sanders computer concepts and applications, Mc Graw-Hill.

WS 101 **WORKSHOP PRACTICE** **F.M.- 50**

(Sessional)

I. Carpentry - Preperation of Slot, notch, Tenon, Matrise
Job : Preparation of different joints, low desk, Stools (any one)

II. Fitting - Filing, Sawing, Chiseling, Drilling Operations
Job : Cross Pane hammer, Paper Weight, Male and female joints in plane Sheets (any one)

III. Smithy - Heating, Hammering, flatenning, bending,
Job : Preparation of Kitchen tongue, Door ring, Chain Link, (any one)

PHYSICS EXPERIMENTS

For PH 102 ENGINEERING PHYSICS LAB-I **F.M-50**

(Any 8 Experiments from List A)

For PH 202 ENGINEERING PHYSICS LAB-II **F.M-50**

(Any 6 Experiments from list A and any two from List B)

LIST-A

1. Determination of Young's moduls by Searle's method.
2. Determination of Young's moduls by bending of beam method.
3. Determination of Young's moduls by Interference fringe method.
4. Determination of Rigidity modulus by Static method.
5. Determination of Rigidity modulus by Dynamic method.
6. Determination of Poisson's ration of rubbers.

7. Determination of coefficient of Viscosity of liquid by Stoke's method.
8. Determination of Co-efficienct of viscosity by capillary flow method.
9. Determination of Surface tension by capillary-rise method.
10. Determination of Surface tension of soap solution by Searle's balance method.
11. Determination of acceleration due to gravity by bar pendulum.
12. Determination of acceleration due to gravity by Kater's pendulum.
13. Determination of thermal conductivity by Searl's method.
14. Determination of thermal conductivity by Lee's method.
15. Determination of of velocity of sound by Kundt's tube.
16. Determination of wavelength of light (Monochromatic) by Fresnel's bi-prism.
17. Determination of wavelength of light by Newton's ring apparatus.
18. Determination of number of lines of plane diffiraction grating.
19. Determination of horizontal component of earth's magnetic field in Laboratory.
20. Characteristics curve of bipolar transistor/ FET.
21. Verification of Laws of transverse Vibration of string using sonometer.
22. Determination Υ (ratio of two Sp heats) by Clement and Desormes apparatus.
23. Determination of J by Calender Barnes apparatus.
24. Determination of refractive index of liquid by liquid lens method.
25. Comparision of magnetic moment of deflection magnetometer.
26. Comparision of e. m. f. of two cells by Potentiometer.
27. Analysis of elliptically polarized light by using laser source.
28. Verification of Brewster's Law.
29. Measurement of velocity of Utrasonic waves in liquids.
30. Determination of dispersive power of a prism.
31. To verify inverse square law of radiation with the help of thermo-electric pyrometer.

DEMONSTRATION EXPERIMENTS IN PHYSICS LABORATORY

LIST-B

1. Determination of charge of electron by Millikan's oil drop apparatus.
2. Determination of e. m. f. of electron by Braun- Tube apparatus.
3. Determination of e. m. f. of electron by Hellical apparatus.
4. Study of a C. R. O.
5. Study of ultrasonic Interferometer.
6. Study of Hall effect apparatus.
7. Laser in Communication and machining.

CY 102 **CHEMISTRY LAB-I (SESSIONAL)** F.M-50

(Any six experiments may be done)

1. Determination of amount of sodium hydroxide and sodium carbonate in a mixture
2. Determination of total harness of water by EDTA method.
3. Estimation of calcium in limestone.
4. Determination of percentage of available chlorine in a sample of bleaching powder.
5. Preparation of phenolphthalein or aspirin.
6. Preparation of buffer solution and determination of pH of a buffer solution.
7. Determination of ferrous iron in Mohr's salt by potassium permanganate.
8. Determination of partition coefficient of Iodine between benzene and water.

CE 101 **ENGINEERING DRAWING-I** MARKS-50

(Sessional)

Introduction to Engineering Drawing instruments and appearatus, Lettering and numerals, Dimensioning, conventions, size of letters for various purposes, Title block.

Scales : Desrciption, R.F. Linear & Diagonal.

Engineering Curves : Ellipse, Parabola, Hyperbola, Cycloid, Epicycloid and Hypocycloid.

Projections : Orthographic projections, Projection of points, straight lines and planes.

Text Books :

1. Engineering Drawing— N.D. Bhatt, Charotar Publications, Anand (Gujarat)
2. Engineering Drawing— R.B. Gupta, Satya Prakashan, New Delhi.

2nd Semester

MA 201 **MATHEMATICS-II** F.M.- 80

(Common To All Branches)

Vectors :

Scalar & Vectors, Vector Spaces, Linear Dependence and Independence, dot Product, Cross Product, Tripple Products.

Matrics and Determinants : Basic Concepts, Addition, Multiplication, Transpose of a Matrix, Matrix Multiplication, Rank of a Matrix, Inverse of a Matrix system of Linear Equations : Existence and general properties of solutions, Determinants of Second, Third and Arbitrary Order, Cramer's Rule, Bilinear, Quadratic, Hermitian and Skew Hermitian Forms, Eigenvalues of Hermitian and Skew-Hermitian and Unitary Matrices; System of Linear Differential Equation.

Vector Differential Calculus : Scalar and Vector fields, Curves, Arc length, tangent, curvature and Torsions. Velocity and Acceleation, Chain Rule and Mean value Theorem.

Transformation of Co-ordinary systems, Directional Derivatives, Gradient of a sealer Field, Divergence and Curl of a Vector Field.

Line and Surface Intergrals : Integral Theorems. Line Integral; Double Integrals. Transformation of double Integrals into Line Integrals, Triple Integrals. Divergence Theorem of Gauss. Application of Divergence Theorem. Stoke's Theorem. Stoke's Theorem. Application of Stokes Theorem.

Fourier Series and Integrals : Periodic Functions, Trigonometric Series, Fourier Series, Euler Formulas, Functions having Arbitary Periodic. Even and odd functions, Half-Range Expansion, Determination of Fourier Co-efficient without Integration. The Fourier Integral.

Text Book :

Advance Engg. Mathematics- Fifth Edition By E. Kreyszig.

Chapters 6, 7, 8, 9, 10.1- 10.6 and 10.9.

PH 201 **Engineering Physics-II** F.M.-40

1. Fundamental forces and fundamental particles. Particle accelerators and Particle detectors.
2. Wave particle duality of matter, De-Broglie wave, Schrodinger's equation and solution; Energy level of a particle in a 1-D potential well of infinite height, Harmonic Oscillator.
3. Nuclear Reactions, Nuclear Fusion, Fission and Chain reaction, Nuclear Power Generation, Nuclear Reactor.
4. Crystallography : Crystals, Lattices & Unit cell; Lattice Parameters, different cubic systems, Calculaton of Packing fraction for different cubic systems.
5. Classification of solids, Band Theory, Band Structure for metals, insulators and semiconductors, Intrinsic and Extrinsic semiconductors P.N. Junction and their V-I relation, Physics of Zener Diode.
6. Super conductivity : Zero resistance and critical magnetic field, Meissner effect and its applications.

7. Classification of substances on the basis of magnetic behavior, Hysteresis, Determination of magnetic susceptibility and permeability by magneto meter method and Bar-Yoke method.
8. Fibre optics : Physics of optical fibre, light wave propagation through optical fibre, Total internal reflection.
9. Lasers : Characteristics of Laser light, basic concepts of laser, Spontaneous and stimulated emission, absorption, population inversion, pumping, construction and components of lasers, Types of lasers. Ruby laser, Gas laser and simiconductor laser, applications, optical Detector, Holography and its applications.

Text Books :

1. Modern Physiscs by : Thereja
2. Physics for Engineers : M. R. Srivastava
3. Engineering Physics : R. K. Gaur and S. L. Gupta

Reference Books :

1. Modern Physics : -Kenneth S. Krane

CY 201 ENGINEERING CHEMISTRY-II F.M.- 40

1. Catalysis— Characteristics of catalytic reactions, promoters, autocatalysis, poisoning, negative catalysis, mechanism of catalytic action, important industrial applications of catalysts and organometallic compounds, Acid-Base catalysis and Enzyme catalysis. - 5 periods.
2. Corrosion and its control :- Dry corrosion, wet corrosion, atmospheric corrosion, Protective measures against corrosion - 5 periods.
3. Pollution and its control :- Sources and types of water and air pollution, Toxic chemicals in the environment, Biochemical effects of fluorides, Arsenic, Cadmium, Lead, Mercury, Carbonmonoxide, NOx, Sulphur dioxide, Control of air and water pollution. - 6 periods
4. Fuels :- Classification of fuels, Primary solid fuels, Primary fuels and other products from coal, Secondary fuels from pertoleum and petrochemicals, combustion calculations. -6 periods
5. Lubrication and Lubricants— Mechanism of lubrication, classification of lubricants synthetic lubricants -3 periods

Books recommended :

1. Engineering Chemistry- Jain & Jain
2. Chemistry in Engineering and Technology, Vol-I & Vol-II- Kuriacosc & Rajaram
3. Text Book of Quantitative Analysis- Vogel

Reference Books :

1. Environmental Chemistry- A.K. Dey
2. Polymer Science- Gowarikar

3. Engineering Chemistry- B.K. Sharma Krishna Prakashan Media (P) Ltd. Meerut 1996.
4. Text Book of Pure and Applied Physical Chemistry- M.S. Bhatnagar, Wheeler publishing- A Division of A.H. Wheeler & Co. Ltd., New Delhi, 1999.

EC 201 BASIC ELECTRONICS F.M.- 80

1. **INTRODUCTION TO SEMICONDUCTORS :**

   Semiconductor, Materials, Energy levels, Intrinsic, N-type and P-type Semiconductors, Concept of holes, Majority and minority Carriers.

2. **SEMICONDUCTOR DEVICES :**

   Semiconductor Diodes : Junction Diode, Operation,Resistance levels, Equivalent Circuits, specification sheets, Transition and Diffusion Capacitance, Diode Testing. Diode Applications : Load line Analysis, Diode approximation, Series and Parallel configurations, AND/OR Gates; Sinusoidal inputs : Half wave and Full wave rectifiers with resistive load only, Clippers and Clampers.

   Bipolar Junction Transistor : Transistor construction, Operation, Amplifying action, CE, CC and CB configurations, Transistor Testing.

   Fixed and Self biasing, Voltage Divider Bias, DC characteristics.

   Field Effect Transistors : Construstion and characteristics of JFET, Transfer characteristics, Specification sheets of JFET, DC Biasing of JFET.

3. **BJT AND JFET AS AMPLIFIERS**

   Hybrid Equivalent model of a BJT. Graphical Determination of h-parameters, Small signal Analysis of CE Amplifier Circuit, RC Coupled CE amplifier.

   Grain-frequency response.

   JFET small signal model, Analysis of a CS FET amplifier.

4. **PRINCIPLES OF FEEDBACK :**

   Negative and positive feed-backs, uses in amplifiers and oscillators. RC phase shift Oscillator.

5. **OPERATIONAL AMPLIFIERS :**

   Differential and Common mode operation, OP-amp basics, Opamp parameters Practical OP-amp circuits, Summing Amplifier, Integrator and Differentiator.

6. **DIGITAL ELECTRONICS :**

   Boolean Algebra, Binary Arithmatics, Hexa-decimal numbers and their conversion.

Logic gates : AND, OR NAND, NOR, EX-OR their realisation. General idea about Adder, Multiplexer, Flip-Flops, Memories, Shift Registers and counters, Principles of DA and AD converters.

7. **COMMUNICATION TECHNIQUE :**
   Principle of Modulation and Demodulation- AM, FM and PCM.
   General idea about noise.
8. **ELECTRONIC INSTRUMENTS :**
   Principle and uses of Digital Multimeter, Oscilloscopes and Signal Sources.
9. **Examples of some practical communication systems :** AM & FM Raio, Satellite Communication, Fibre Optic Communication.

TEXT BOOK

1. Electronic Devices and Circuit Theory by R.L. Boylestad and L. Nashelsky. Selected portion from chapters 1-9.
2. Integrated Electronics by Millman & Halkias. Selected portion from chapters.

Reference Book :

1. Principle of Electronics - V. K. Mehta
2. Selected Portions of Electronics Communication System - R.Rhody & Coolean.
3. Digital Logic & Ckt design- M. Moris Mano

ME 201 ENGINEERING MECHANICS F.M.- 80

A. Statics

1. System of Coplanar forces : Conditions for equilibrium, concept of free body diagrams, solution of plane frames by method of members.
2. Force Analysis of plane Trusses (method of joints and method of sections)
3. Friction : freebody diagrams applied to simple problems involving friction, simple belt and screw friction.
4. First moment of areas and Centroid; Theorems of Pappus; Second moment of real; Polar moment of Inertia.
5. Principles of Virtual work : Equilibrium of ideal systems, Stable and unstable equilibrium.

B.

6. Kinematics of Rigid body- Plane motion, Curvilinear motion, motion of a projectile.
7. Kinetics of Translating and rotating rigid bodies, Moment of Inertia of bodies.
8. D' Alembert's Principle- Application to a single particle, rigid bodies in translation and rotation in ideal systems.
9. Impulse and Momentum : Application of Principle of conservation of linear momentum to single particle, rigid bodies and ideal systems; impact; application of principle of angular momentum; principle of conservation of momentum.

10. Work and Energy : Principle of Work and Energy for Single Particle, rotating rigid bodies and ideal systems; principle of conservation of energy;

TEXT BOOK :

1. Engineering Mechanics by S. Timoshenks and D. H. Young.

Reference Books :

1. Mechanics (Parts I & II)- J. L. Merian.
2. Mechanics for Engineers- Statics and Dynamics- Beer and Johnston
3. Engineering Mechanics- Statics & Dynamics- I. H. Shames ff

CS 201 PROGRAMMING LANGUAGES F.M.- 80

UNIT-I Anatomy of a C program, Type, Operator, Expression and Control Flow : Variables names, Data types and sizes, Constants, Declarations. Arithmetic operators, Relational and ligical operators, Type conversions, Increment and decrement operators, Bit-wise logical operators, Assignment operators and expressions, Conditional expressions, Precedence and order of evaluation. Statement and Blocks, If-else, Else-if, Swith, While and For loops, Do-while loops, Break and continue, Goto and Labels.

UNIT-II Functions and Program Structures : Basics of functions, Functions returning non-integers, External variables, Scope rules, Static variables, Register variables, Block structure, Initialization, Recursion.

UNIT-III Derived Data types, Pointers and Arrays : Pointers and addresses, Pointers and function arguments, Pointers and arrays, Address arithmatic, Character pointers and functions, Pointer arrays, Pointers to pointers, Multi dimensional arrays, Initialization of pointer arrays, Pointer vs. Multi dimensional arrays, Command-line arguments, Pointer to functions.

UNIT-IV User Defined Data types, Structures & I/O : Basic of structures, Structures and functions, Array of structures, Pointers to stuructures, Self-referential structures, Table lookup, Typedef, Union and bit-fields.

UNIT V Introduction to problem solving : Top-down design, implementation of algorithms, Problem-solving aspect.

UNIT VI I/O & FILES : Standard input and output, formatted output- printf, Variable length argument lists, formated input-scanf, File access, File descriptor, Low level I/O-Read and Write, Open, Create, Close, Unlink Random Access-Lseek.

BOOKS RECOMMENDED :

1. R.G. Dromey : How to solve it by computer, PHI New Delhi.
2. B.W.Kernighan & D.M.Ritchie : The C Programming Language.
3. B.S. Gottfried : Programming with C, TMH.
4. Balagurusamy : The C programming Language, TMH.

CY 202 **CHEMISTRY LAB-II (SESSIONAL)** F.M-50

(Any six experiments may be done)

1. Standardisation of sodium thiosulphate and determination of dissolved oxygen in a sample of water.
2. Determination of acid value of oil.
3. Determination of viscosity of a lubricating oil by redwood viscometer.
4. Determination of flash point and firepoint of a given oil by Pensky-Marten's flash point apparatus.
5. Determination of total residual chlorine in a water sample.
6. Determination of iodine value of an oil.
7. Fluegas analysis by simple Orsat's apparatus.
8. Determination of volatile matter and ash content of a simple of coal.

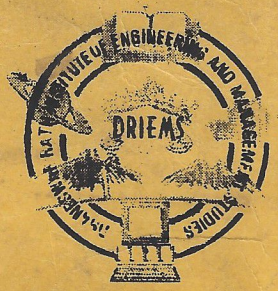
ME 201 **ENGINEERING DRAWING-II** F.M-50

(Sessional)

Projections of solids, sections of solids, Isometric projections.
Conventions : Central line, sections, Hidden Lines, Sectional views.
Free hand sketches.
Basic Machine elements viz. Nuts, bolts, screws and locking devices.
Rivets and rivetted joints
Keys, cotters & pin Joints.
Locking devices
Coupling : Flange Coupling, Hooke joints, shaft coupling.
Pulleys
Simple Assembly of machine parts.

TEXT BOOKS :

1. A Text book of Machine Drawing.
   — R.B. Gupta, Satya Prakashan New Delhi.
2. Machine Drawing
   — N D Bhatt, Charotor Book Stall, Anand
3. A Text Book of Machine Drawing— P. S. Gill
4. Engineering Drawing
   — AC Parkinson (Metric Edition)



DRIEMS

Scheme and Syllabus
for
Electronics & Telecommunication Engineering.
3rd & 4th Semester

UTKAL UNIVERSITY

Dhaneswar Rath Institute of Engineering and Management Studies

Kairapari, Tangi, Kotsahi, Cuttack

ELECTRONICS AND TELECOMMUNICATION ENGINEERING

THIRD SEMESTER

COURSE NO.	SUBJECTS	TOTAL MARKS	DURATION UNIV. EXAM.	LECTURER HOURS PER WEEK
1	2	3	4	5
THEORY				
MA 301	Mathematics - III	100	3	4
EE 302	Network Theory	100	3	4
EC 301	Semiconductor Devices	100	3	4
EC 302	Analogue Electronic Circuits	100	3	4
EC 301	Electrical Machines - I	100	3	4
	Total	500		
SESIONALS				
EC 303	Analogue Electronics Lab.	100		6
EE 303	Electrical Engg. Lab.	100		6

FOURTH SEMESTER

COURSE NO.	SUBJECTS	TOTAL MARKS	DURATION UNIV. EXAM.	LECTURER HOURS PER WEEK
1	2	3	4	5
THEORY				
MA 401	Mathematics - IV	100	3	4
EC 401	Digital Electronics Circuit	100	3	4
EC 402	Analogue Communication Technique	100	3	4
EC 403	Microprocessors	100	3	4
EC 404	Electronic Measurements & Instruments	100	3	4
	Total			
SESIONALS				
EC 405	Digital Electronics Lab.	100		6
CS 405	Computing Lab.	50		3
EC 406	Microprocessor Lab.	50		3
	Total	200		

THIRD SEMESTER
MA 301 MATHEMATICS - III
(Common To All Branches)

F.M. - 80

Section — A (32 Marks)

Partial Differential Equations :

Basic Concepts, Vibrating String. One Dimensional wave Equation, Separation of variables (product method) D' Alembert's Solution of the Wave Equation, One dimensional heat flow in an infinite bar.

Vibrating Membrane :

Two Dimensional wave Equation, Rectangular membrane, Laplace Equations : Potential problems. Laplace Transform applied to partial Differential Equations.

Section — B (48 Marks)

Complex Variables :

Complex numbers, Triangle Inequality, Curves and Regions in Complex plane, complex functions, Derivatives, Analytic Function, Cauchy - Riemann Equations, Rational Functions, Roots, Exponential Functions, Trigonometric and Hyperbolic Functions, Logarithm, General Power.

Conformal Mapping, Linear Fractional Transformation, Complex Integrals : Line Integral in complex plane, Basic Properties of the complex line Integral, Cauchy's Integral Theorem. Evaluation of Line Integrals by Indefinite Integration. Cauchy's Integral Formula.

Power Series, Taylor Series of elementary functions. Practical methods for obtaining power series, Laurent Series, Analyticity at Infinity, Zeros and Poles.

Integration by method of Resides :

Resides, The Residue Theorem, Evaluation of Real Integrals.

Test Book :

Advanced Engg. Mathematics Fifth Edition - By E. Kreyszing.
Chapters 11.1-11.11, 11.13, 12.1-12.9, 13.1-13.3, 14.1-14.5, 16.1-16., 17.1-17.3.
Chapters 11 : 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8, 11.9, 11.11, 11.13.
Chapters 12 : 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9.
Chapters 13 : 13.1, 13.2, 13.3.
Chapters 14 : 14.1, 14.2, 14.3, 14.4, 14.5.
Chapters 16 : 16.1, 16.3, 16.4, 16.5, 16.7, 16.8.
Chapters 17 : 17.1, 17.2, 17.3.

3rd Semester
EE 302 NETWORK THEORY

F.M - 80

(Common of Electrical/Electronics & Tele-com/Electronics & Instrumentation/Information Technology/Computer Science & Engg.)

1. **Convention for describing Networks :**
   Reference directions for current and voltage; active element conventions; topological description of networks.
2. **Some Useful Techniques Circuit Analysis :**
   Source transformation, Nodal analysis, mesh analysis, duality, Thevenin's theorem, Norton's Theorem, Superposition Theorem, Maximum Power Transfer Theorem, reciprocity theorem, Millman's theorem.
3. **Resonance in A.C. Circuits :**
   Series and Parallel resonance, characteristics and Properties of resonant circuits, selectivity, B.W. & Q factor, locus diagram.
4. **Coupled Circuits :**
   Dot convention for coupled circuits, co-efficient of coupling, loop analysis of coupled circuits, tuned coupled circuits, single and double tuned coupled circuits, over and under coupling.
5. **Polyphase Systems :**
   Phase sequence of three-phase systems, solution of 3-phase circuits with balanced source and balanced/unbalanced loads. Measurement of three-phase power by two wattmeter method.
6. **Transient Analysis of AC/DC circuits :**
   Transient response of simple RC, RL, RLC circuits to constant and sinosoidal excitation in time domain by Laplace transformation method; response to step, impulse and ramp inputs, s-domain circuits.

7. Two Port Networks :

Short circuit, open circuit and transmission parameters, hybrid parameters, T and Pi representation, relationship between parameter sets, Inter-connection of two ports (cascade and parallel); Image and Iterative impedances.

8. Network Function and Responses :

Concept of complex frequency, Driving point and Transfer functions for one port and two port, calculation of network functions, Poles and Zeros of network functions, Restriction on pole and zero, locations of network functions, Impulse response, Complete response, Time - domain behavior from pole-zero plot.

9. Filters :

Design of low pass, high pass, band pass, band elimination filters.

10. Fourier Series and Fourier Transforms :

Fourier series representation of complex waves, Discrerte Spectra, r.m.s. value of complex waves, power, steady state response of linear circuits, harmonics in 3 phase circuits, Fourier integral and Fourier transform of delta, signum, step functions, application to RL and RC circuits.

11. Network Synthesis :

Driving point function, properties of positive real function, Synthesis of LC, RC and RL driving point function by Cauer-I & Cauer - II, Foster I & II forms.

References :

1. Network Analysis : M.E. Van Valkenburg
2. A Course in Electrical Circuits and fields : M.L. Soni, J.C. Gupta & P.V. Gupta
3. Network synthesis : M.E. Van Valkenburg
4. Schaum's outlines of theory and problems of Electric Circuits in S.I. Units : Josheph A. Edminster
5. A Course in Electrical Circuit Analysis : M.L. Soni & J.C. Gupta
6. Engineering Circuit Analysis : W. Wayt & J.E. Kommerly

Electronics & Telecomm. Engg.
3rd Semester
EC 301 Semiconductor Devices

F.M. - 80

A. Review of Energy Bands in Solids :

The nature of atoms. Atomic Energy levels, Electronics structure of the Elements. The energy band theory of Crystals, Insulators, Semiconductors and metals.

B. Transport Phenomena in Semiconductors :

Intrinsic Semiconductor, Mobility and conductivity, Donor and Accepter impurities, Charge densities, electrical Properties of Ge and Si. The Hall Effect. Conductivity modulation : Generation and Recombination of Charges. The Diffusion. The continuity equation, Injected Minority Carrier charge. Potential Variation Within a Graded Semiconductor.

C. Junction Diode Characteristics :

The open-circuited p-n junctions as rectifier, currents in P-n diode, V-I Characteristics, Temperature dependence, space charge or Transition Capacitance, charge control description of diode. Diffusion Capacitance. Switching times. Breakdown diodes. The Tunnel diode, the Semiconductor photodiode. The Photo Voltaic effect. Light Emitting Diode.

D. The Transistor :

The junction Transistor; transistor current components. Transistor construction. The early effect or Basewidth modulation. Input and Output Characteristics, the Active Regiori, Saturation Region, Cut-off region. Typical transistor junction Voltage Values. Analytical Expressions for Transistor characteristics, the Ebers-Moll Model, Maximum Voltage Rating. Avalanche Multiplication, Reach-through, the Photo transistor.

E. Integrated Circuits Fabrication and Characteristics :

IC Technology, Basic Monolithic Integrated Circuits techniques, Epitaxial growth, Masking and Etching, Diffusion of Impurities. Transistors for Mono-lithic circuits. Layout Monolithic diodes, layout, Integrated Resistors, Integrated Capacitors and Inductors. Monolithic Circuit Layout : Design rules for Monolithic Layout. The Fabrication Sequence. The Metal Semeconductor Contact. The Schottky diode.

Test Book : Integrated/Electronics, analogue and Digital Circuits and System.
By : Millman and Haikias.

Chapters : 1, 2, 3, 5 and 7.

Reference : Solid State Electronics Devices.
By : Ben G. Streetman.

Publisher : PHI

Electronics & Telecomm. Engg.

3rd Semester

EC 302 Analogue Electonics

F. M. - 80

D.C. Biasing of BJTs and FETs :

Operating Point, Fixed and Voltage divider Bias, Bias Stabilization. Design of Bias.

Modelling of BJTs and FETs :

Hybrid equivalent model. Graphical determination of h-parameters. AC modeling of FETs. Low Frequency small signal analysis of CE, CC and CB transistor amplifiers and CD and CS FET amplifiers with and without Load and source resistance System approach.

Designing BJT and FET amplifier networks :

BJT and JFET frequency response. Low and High frequency analysis of BJT and FET amplifiers. Bode plot. Gain-Frequency response of R.C. coupled amplifier. Multistage Frequency effects. Square wave Testing of amplifier.

Compound configurations :

Cascade, cascade and Darlington connections. Differential Amplifier circuits using transistor.

Feedback amplifiers and Oscillators :

Effects of negative feedback classification of feed back types, analysis of feedback amplifier circuits. Barkhausen crirterion of oscillation. Phase shift Oscillator, Wien Bride Oscillator. Tuned Oscillator circuits, crystal Oscillator.

Operational Amplifiers :

Op-amp Inverting and Non inverting types. Op-amp specification, CMRR, measurement of parameters. Application of Op-amp as constant gain multiplier, Voltage summing, Integrator,Differentiator, Instrumentation circuits.

Power Amplifiers :

A. B. and AB types, Distortion in power amplifiers. Class A. B and AB circuits, Conversion efficiency, Push-pull amplifier.

Regulated Power Supplies :

Capactive, Filter, Discrete Transistor voltage. Regulator, IC Voltage Regulator.

TEXT BOOKS :

Electronics Devices and circuit Analysis - By Boylestad and Nadhelsky
Sixth Edition, PHI
Selected portion from chapters 4,5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 18 and 19.

REFERENCE BOOKS :

Integraated Electronics - By Millman & Halki Mc Graw Hill Book Co.

Electorins & Telecomm. Engg.

3rd Semester

EF 301 (0) Electrical Machine **FM - 80**

a) **D.C. Machines :**

D.C. Generator - Construction and principle of operation, e.m.f. equation; types of generators; no-load and load characteristics; Voltage build-up of shunt generator, voltage ragulation. Application.

D.C. Motor - Construction and principle of operation; back e.m.f; torque and speed equations; characteristics and performance curves; speed control of shund and series motors-out line of different methods used; necessity of starter, 3-point starter. Industrial applications.

Lossles and efficiency of D.C. Machines

b) **Transformer :**

Single phase-Construction and principle of operation; e.m.f equation; equivalent resistance and reactance; approximate equivalent circuit, phasor diagram; open circuit and short circuit tests, regulation losses and efficiency.

c) **Construction of Three phase Transformer :**
Connection of 3 single phase transformer as a three phase transformer.

d) **Synchronous Machines :**
3-phase alternator-construction and principle of operation; e.m.f. equation, distribution and pitch factor, regulation by synchronous impedance method.
Three-phase synchronous Motor: Construction and principle of operation; V-curves; methods of strating. Applications.

e) **Three-phase Induction Motor :**
Construction of squirrel cage and slip-ring type; principle of operation; Torque-slip characteristics, starting torque; maximum torque; equivalent circuit, starting and speed control. Application.

f) **Single-phase Induction Motor :**
Construction and principle of operation. Application.

g) **Universal motor :**
Construction; Principle of operation. Applications.

TEXT BOOKS :

1. M.V. Deshpande - Electrical Machines (Wheeler publishing)
2. B.L. Theraja, - H.L. Theraja, Vol. II AC & DA Machines (S. Chand & Co. Ltd.)
3. H. Cotton Electrical Technology 7th Edition (CBS Publisher)

FOURTH SEMESTER

MA 401 Mathematics - IV

(Common to CSE, EE, EN & TC, EN, & IT)

1. **Probability & Statistics :** **(24 marks)**
Sample mean and Sample Variance, Random Experiments, Outcome, Events. Probability, Random Variables : Continuous and Discrete distributions, Means and Variance of Distributions, Binomial, Poisson and Hypergeometric destribution , Normal distribution, Random Sampling, Random numbers, Estimation of Parameters confidence Intervals, Testing of hypotheses, Decision, Pairs of measurements. Fitting strait lines.

Text Book : Advanced Engg. Mathematics Kreyszig. 5th Edition
Chapters 23 - 23.3, 23.4, 23.5, 23.7, 23.8, 23.9, 23.10, 23.12, 23.13, 23.14, 23.15 & 23.20.

II. **Computer Based Numerical Techniques :** **(56 Marks)**

1. **High Speed Computation :**
Computer arithmetic, Errors, Machine computation, Computer software.

2. **Transcendental and polynomials equations.**
Bisection Method, Iteration Methods based on Firth degree equation, Rate of convergence, Iteration Methods, Methods for Complex roots, Polynomial equations Birge - Vieta Methods.

3. **Interpolation and Approximations :**
Lagrange and Newton's Interpolations, finite Difference Operators, Interpolating Polynomials using finite difference, Least square approximation.

4. **Differentiation and Intergration :**
Numerical differentiation, Partial differentiation, Numerical integration, methods based on interpolation. Method based on undetermined co-efficient. Gauss - Legendre, Gauss - Chyshev methods.

5. **Ordinary differential equations :**
numerical Methods, Euler Method, Backward Euler Method, Mid point Methods single step Method, Tayler Series Methods, Runge-Kutta Methods, second and forth orders.

TEXT BOOKS :

1. Numerical methods for scientific and Engineering Computations by M.K. Jain, S.R.K. Interger and R.K. Jain 3rd Edition.

Chapters 1 (1.2 to 1.5)
2 (2.1 to 2.3, 2.5, 2.6, 2.7, 2.8)
4 (4.8 and 4.9)
5 (5.1 and 5.11)
6 (6.1 to 6.3)

Suggested Reading :

1. Advanced Engineering Mathematics E - Kreyszing , 8th Edition
Chapters 17, 18, 19.

Electronics & Telecomm. Engg.

4th Semester

EC 401 Digital Elecetronics Circuits

FM - 80

Number System and Codes :

Decimal, Binary and Hexadecimal numbers. Their convesion. Binary Arithmetic 1's and 2;s Complements. BCD codes Excess three Code, Self complementing code, ASCII and EBCDIC. Codes, Grey Codes, error Detection and Correction, Hamming Code.

Logic Gate :

AND, OR, NAND, NOR, EX-OR Gates, Gate propagation Delay time, Noise immunity, loading consideration.

Boolean Algebra :

Rules and laws of Boolean Algebra, DeMorgan's Theorems, Boolean Expression for Gate Networks, Simplification of Boolean Expression. The Karnaugh Map. SOP and POS expression.

Combinational Logic :

Analysis and Design of Combinational Logic Circuits. Gate Minimization using K-Map. Universal Properties of NAND and NOR gates.

Combinational Switching Logic :

Adders. A method of speeding Adding, Magnitude Comparators, Decoders, Encoders, Code Conversion, Multiplexers, Demultiplexers, Parity Generators. Simple combinational Circuits Design: Seven Segment Display logic.

Digital Logic Gates :

Positive and Negative Logic System. Diode logic, DTL, TTL, ECL and NMOS logics.

Sequential Circuits and Applications :

Flip-Flop : Edge Triggered. Pulse Triggered, JK, SR, T, D, Master-Slave F/Fs, F/F Applications, Counters: Asynchronous and Synchronous counters, Up/Down synchronous counters, shift registers: Any In-Any out shift Resistor, Shift Register Counters. Application.

Memories :

Memory Concept. ROMs. PROMs, EPROMs RAMS, Memory Expansion.
AD and DA convertors, Interfacing Digital and Analog Systems.

TEXT BOOKS :

1. Digital Fundamentals - Floyd, 3rd Edition.
   Selected portion from Chapters 2 - 11.

REFERENCE :

1. Inproduction of Digital Technology - L Mashelsky.
2. Digital Principles & Application : Malrind.
3. Digital Integrated Electronics : Taub & Sehilling.
4. Modern Digital Electronics : R.P. Jain.

Electronics & Telecommunication Engg.

4th Semester

EC 402 ANALOG COMMUNICATION TECHNIQUES

FM - 80

Signals :

Singals in time domain, Classification of Signal, Simple Operation like Time Shifting, Time Scaling and Time Inversion of Signals. Unit Impuls and Unit Step Functions. Fourier Series representation of common Signal. Sampling function Response of a Linear System. Normalized Power . Power Spectral Density, The Fourier Transform. Frequency domain representation of common Signals. The Convolution Theorem. Band Limiting of Waveforms.

Amplitude-Modulation Systems :

Frequency Translation, A method of frequency franslation. Recovery of Baseband Signal. Amplitude Modulation, Maximum allowable Modulation. The Square law Demodulator, Spectrum of an AM Signal, Modulators and Balanced Modulator, single sideband Modulation, Method of generating SSB. Vestigial Sideband modulation. Compatible Single Sideband Multiplexing.

Frequency-Modulation System :

Angle Modulation, phase and Frequency Modulation and their relationship, Phase and Frequency duration Spectrum of an FM singal, due to sinusoidal Modulation, Bandwith of FM Signal; Effect of Modulation index or BW, Constant BW and narrow Band width FM. Wideband FM. FM Generation; parameter variation method, arm strong system of FM generation, Frequency Multiplication applied to FM Signal FM Demodulations.

Pulse-Modulation Systems :

The Sampling Theorem, Low-Pass signal, Bandpass signals pulse amplitude modulation. Channel Bandwidth for a PAM Signal, Natural Sampling. Flat top Sampling, signal recovery Through Holding.

Noise :

Source of noise. Shot noise. Thermal noise, white Noise, Frequency domain representation of noise, Spectral components of noise, response of a narrow band filter to noise, superposition of noise; Mixing noise with sinusoid Signal. RC low pass and bandpass filtrers. Noise Bandwith.

Noise Performance of Analog Modulation Systems :

Amplitude modulation, Receiver noise performance of SSB-SC, DSB-SC, DSB with Carrier, Square law Demod and Envelope demod.

The frequency Modulation Receiver, An FM Demod calculation of output signal and noise power pre-emphasis and De-emphasis. Phase Modulation in Multiplexing. Comparison of AM & FM. and PM. Effect of Transmitter Noise.

Threshold in Frequency Modulation :

Calculation of threshold in an FM Discriminator. The Phase-Locked Loop, Analysis, Stable and unstable Operating Points. Output SNR of a PLL.

Text Book :

1. Principle of Communication System 2nd Edition By Taub & Schilling.
   Selected portion from Chapters : 1, 3, 4, 5, 7, 8, 9, 10.

Reference Book :

1. Communication System : Simon Haykin.
2. Modern Digital & Analogue Communication System 3rd Edition By B.P. Lathi.

Electronics & Telecomm. Engg.

4th Semester

EC 403 MICROPROCESSORS

(Common to Electrical, Insrumentation, Comp Sc. IT)

FM - 80

1. **Microprocessor Architecture :**
   Introduction to microprocessors, 8085 Architecture, Data & Address Buses, Addressing the Memory & I/O Devices, Intel 8085 Register organisation, A detail study of 8085 CPU (Timing & Control unit)
2. **Instruction set of 8085 :**
   Data transfer group, Arithmetic group, Logical group, Branching and Machine control group, Instruction format, timings and operation states.
3. **Memory organisation :**
   Classification of memory, semiconductor memory organisation, memory mapping organisation of 2816, 2164, 2716, 2732 memory chips.
4. **Programming with 8085 :**
   Assembly language programming using 8085 instruction sets, method of assembling and debugging, use of stacks and subroutines.
5. **Interfacing Memory and I/O Devices :**
   Basic Interfacing concepts, Memory interfacing, address space partitioning, Data transfer schemes, Programmed data transfer, Direct memory access data transfer, serial data transfer, Interfacing input output devices (simple switches, key board, simple desplay, DAC, ADC, teletypewriter, Rs 232 serial interface IEEE 488 parallel interface. Maskable & nonmaskable interrupts, Vector interrupt levels of 8085, Priority assignment, Restart as software interrupt.
6. **Microprocessor based system development aids :**
   Basic idea about 8212, 8155, 8255, 8259, 8257 and 8251, A simple data acquisition system, microprocessor based system development aids.
7. **16-bit processors (Intel 8086)**
   Introduction, Architecture, addressing modes (Resister & immediate) for accessing data, memory addressing modes accessing modes for assessing I/O ports, 8086 Instruction set, Instruction format, 8087 coprocessor.

Text Books :

1. Microprocessor architecture, Programming and Application with the 8085 : By Ramesh S. Gaonk Penram International Publishing (India), Fourth Edition, 2000.
2. Introduction to microprocessors : by A.P. Mathur, TMH Publication, 1999.

Reference Books :

1. Microprocessors and Interfacing, Programming & Hardware : By Douglas V.Hall-TMH, 3rd Editi 1999.

Electronics & Telecomm. Engg.

4th Semester

EC 404 ELECTRONIC MEASUREMENT AND INSTRUMENTS

A.C. Bridges :

General Bridges network, Equation for Bridge balance . Measurement of self inductiance by maxwe bridges. Anderson's Bridge and Owen's Bridge, their comparision. Schering Bridge for measurem of capacitance, Wien's Bridge for measurment of frequency. Source of error in Bridge measurem Precaution and techique for reducing error, Wathner Earhing device. Measurement Dialectric const and Quanity factor by a Q-meter.

Transducer :

Thermistors : salient features and construction, Resistance temperture characteristics, Voltage curr and current-time characteristics of thermistor applications. Thermocouples : Principle and constructi various compousation, Measurement using thermocouples, advantage and disadvantage, Line Variable Differential transformer (LVDT) : Principle, construction and uses. Piezoclectric Transduc Modes of operation. equivalent circuits, frequency and impluse response.

Electronics Voltmeter :

Difference amplifier Source flooer type; True rms reading type voltmeter. Electronic Multimeter, Br Theory, Sailent features and Operation of all the above types. Considerations in selecting an analog Voltmeter. A.C. Diffrential Voltmeter.

Cathode Ray Oscilloscope :

Block Schematic Arrangement, Constructional features, Typical CRO Circuits : time base vertical a horizontal amplifier, synchronisation. Measurement of amplitude, phase frequency and time usi CRO. pulse measurement, Oscilloscope Probes and their typical charateristics.

Digital Frequency meter :

Basic Circuit, time base, Simplified Composite circuit of a Digital Frequency meter.

Digital Volt meter :

Ramptype intregating type and potentiometer type Digital voltmeter . Accuracy Frequency meter.

Function Generators :

Block Schematic diagram of a squarewave. triangular wave and sinusoidal wave function generat Principle of operation. Signal Generator for Generation of Amplitude and frequency modulated wa Basic principle of Ramdom Noise Generator.

Spectrum Analysis :

Basic Building Blocks, measurements using a Spectrum Analyzer.

Test Book :

1. Electronics Measurements By : - Terman & Petit
2. Electrical & Electronics Measurement and Instrumentation By : - A.K. Sawhney.

DRIEMS

Courses of Studies
for
5th & 6th Semester
for
Electronics & Telecommunication Engg.

UTKAL UNIVERSITY

Dhaneswar Rath
Institute of Engineering
and Management Studies
Kairapari, Kotsahi (Tangi)
Cuttack, PIN - 754 022
✆ : 695755 / 370248

ELECTRONICS & TELECOMM. ENGG.

5th Semester

EC 501 DIGITAL COMMUNICATION TECHNIQUES F.M. - 80

Pulse code Modulation Electrical representation of Binary digits. The PCM System, Companding Multiplexing PCM signals. Differential PCM, Delta Modulation Adaptive delta Modulation Vocoders. Channel Vocoder. Linear Predictive coder.

Noise in PCM and Delta - Modulation system :

Quantization noise, output Signal Power, Thermal noise, Output SNR in PCM, Quantization noise in DM, Output SNR in DM. Delta Pulse Code Modulation. Effect of Thermal noise in DM. Comparision of PCM and DM.

Digital Modulation Techniques

BPSK, DPSK, Differential Encoded PSK, QPSK, Mary PSK. Quadrature Amplitude Shift Keying (QASK), BFSK M-ary PSK, Minium Shift Keying (MSK).

Data Transmission

A Baseband signal Receiver. probability of Error. The Optium Filter, White Noise the Matched Filter, probability of Error of Matched. Filter Coherent Reception : Co- relation PSK, FSK Non-Coherent Detection of FSK. Differential PSK and QPSK. Error Probability of BPSK, BFSK & QPSK. Bit by bit encoding symbol encoding. Relationship between Bit error rate and Symbol error rate Probability of error in Quadrature partial shiftkey System Comparision of modulation System.

Information Theory and Coding

Discrete messages. The Concept of Amount of information. Information entropy. information rate, Coding to increase average information per bit.

Sharon's Theorm, Channel Capacity, Capacity of Gaussian Channel Bandwidth-S/N Trade off.

Coding, Parity Check. Coding for error detection and correction. Block Codes : Coding and decoding. Example of Algebric codes. Burst Error correction. Convolution Coding and Decoding. Approximate Repeat Request (ARC). Performance of ARQ systems. Application of Information Thery : An Modulation system.

TEXT BOOK :

1. Principless of Communication System - Second Edition by & Schilling, Selection Portion for Chapters 5,6,11,12 and 13.

REFERENCE BOOK

1. Modern digital & Analogue Communication system : 3rd Edition By B.P Lathi
2. Communication system- Siman Hylein .

5th Semester

(COMPUTER SC. & ENGG.)

CS 501 COMPUTER SYSTEM ARCHITECCTURE

(COMMON TO C. SC, I.T, EN & TC) F.M. - 80

1. Basic Computer organisation- (brief discussion of varius modules of computer system & their interconnection). Information Representation & binary arithmetic, basic combinational & sequential circuit (brief discussion) - T1 Ch-3, 10.
2. Instruction set design - Instruction Codes, Instruction cycle, timing and control, Memory-reference instructions : Design of ALU, Design of floating point processor, microprogram Example, Design of control unit.
3. Classification of computer systems, High performance memory systems, Pipeline system design and it's application to SISD computer systems, pipeline hazards & techniques to eliminate, SIMD & array processors, MIMD & multiprocessotr system, Associative processor for Parallel Processing, Tagged Architecture, Systolic Architecture, Data flow computing.
4. RISC, RISC pipeline, RISC vs. CISC controversy, Super scalar processor, Super pipeline processor, Vector processor.
5. Case study of a typical system - CRAY, VAX, STAR-100 ILLIAC-IV, STRAN

TEXT BOOKS

T1. Computer system Architecture-Moris Mano

T2. Computer Architecture & Parrel processing-kai Hwang and Fayes A. Briggs.

REFERENCE BOOKS

R1. Computer Organisation & Architecture -Hayes, J. P.

R2. A quantitative approach to Computer Architecture - Hennesey and Patterson

ELECTRONICS & TELECOMM. ENGG.

5th Semester

EC 502 ADVANCED ELECTRONIC CIRCUITS F.M. - 80

Puise Transformers :

Transformers Models, Complete Equivalent Circuits, Transformer inductance, Transformer Capacitance, Rise-time Response of a Transformer, Complete pulse Response, pulse Transformer General Consideration.

Wideband Amplifiers (Compensated) :

Shunt compensation of Transistor stage in a Caseade. Other methods of Rise-time Compensation, Rise-time of Cascaded Compensated stages; Low frequency compensation.

Multivibrators :

Bistable Multivibrator : Stable states of binary, fixedd bias Transistor binary, Commutating Capacitors, Symmetrical and Unsymmetrical Triggering of binary. Schmitt trigger circuit, Emitter coupled binary.

Monostable multivitrators :

Collector coupled Monostable multivibrators, Emitter coupled Monostable multivibrators, Triggering of monostable, Multivibrators Applications.

Astable Multivibrator :

The Collector coupled Astable Multivibrators, the Emitter coupled Astable Mulitivibrator Applications.

Negative Resistance Switching Circuits :

The Tunnel Diode, volt-ampere characteristics performance Analysis. The Unijunction Transistor; Volt-Ampere Characteristic, Performance Analysis.

Basic circuit Principles of Negative Resistance Switching Circuits. Monostable, Astable and Bistable operation. Voltage controlled Negative Resistance Switching Circuits. Monostable Astable & Bistable using Tunnel Diode. Use of unijunction Transistor to generate sawtooth waveform.

Time-Base Generator :

Voltage-time Base Generator : General feature of time base signal; Exponential sweep circuit, Miller and Boot strap Time Base Generators.

Current time-Base Generator : A simple current sweep. Linearity correction through Adjustment of Driving waveform, A Transistor Current Time-Base Generator.

Blocking-Oscillator Circuit :

A Triggered Transistor, Blocking oscillators-Base timing. Applications of Blocking Oscillator.

TEXT BOOK

1. Pulse, Digital & Switching waveforms :- Millman & Taub, 11th Reprint 1999. Selected portions from Chapters 3, 5, 10, 11, 12, 13, 14, 15 and 16.

HU 501/601 ENGINEERING ECONONICS F.M. - 80

(Common to All Branches)

1. Demand and Supply Analysis :

Meaning of Demand, type of demand, determinate of demand, the Law of dernarxi, demand elasticities.

Supply curve, elasticity of supply.

2. Production & Cost Analysis :

Production function, Law of Returns, Returns to Scale, Nature and type of cost. Accounting & economic cost, cost function. Linear Programming, input-output analysis.

3. Theory of Firm and Pricing :

Objectives of the firm, Marginal cost pricing versus full cost pricing, Depreciation, allocation of Common cost among individual products - Administered princes, investment decision under risk an uncertainty.

4. **Project Enaluation :**

Net Present Value-Internal Rate of Return, Cost Benefit Analysis.

5. Corporateform of Organisation Features Methods of Controls Divergence Problem - Financial Statements - Radio Analysis and Interpretations - Industrial Finace - types of Finace - Money & Capital markets-Commercial and Development Bankas.

TEXT BOOKS :

1. Modern Micre Econimics : A. Koutsayiannis
2. Industrial Organisation in India : Lokanathan
3. Some aspects of Industrial Finacnce in India : George Rosen
4. reading in Industrial Capital : L. C. Gupta.

HU 503 ELCTROMAGNETIC FIELDS AND WAVES F.M. - 80

(Common to EE, EC & EI)

Co-ordinate Systems :

Rectangular, Cylindrical and Spherical, Transformation.

Reviow of Vector Cakulus :

Gradient Divergence and Curl Operation Stoke's Theorem, divergence Theorem.

Electrostatic Fields :

Columb's Law Electric Fields due to continuous charge distribution, Gauss's Law, Maxwell's Equation Application of Gauss's law, Electric Potential, An Electric dipole, Flux lines & Equipotential Surface, Energy Density in Electrostatic fields.

Electric Field in Material Space :

Electrical : Properties of materials, Convection Current, Conduction, Polarization in Dielectric, Dielectric medium, Continuing Equation and Relaxation Time Boundary Conditions.

Electrostatic Boundary Value Problem :

Poison's & Laplace Equations. Uniquesness Thcorem, generalprocedure of solving poison's and Laplace's Equations, Resistance and Capacitance, Methods of Images.

Magnetostatic Fields :

Biot-Savant's law. Ampere's Circuilal law - Maxwell Equation. Application of Ampere's law, Magnetic Fiux Density, Magnetic Vector Polential, Derivation of Biot-Savant's law and Ampere's law.

Magnetic Forces, Matcrial and Devices :

Force due to Magnetic, Fields, Magnetic Torque and Moments. A magnetic Dipole, Classification of magnetic materials, Boundary conditions, Inductors and Inductance, Magnetic Energy, Magnetic Circuits, Force on Magnetic Materials.

Time Varying ficlds and Maxwell's Equations :

Faraday's law, Transformas and Motional EMFs, Displacement Current, Time varying Potential, Time-Hamnonic fields. Derivation of Maryell's Equations in Differential and Integral forms, Continuty Equation.

Electronagnetic Wave Propagation :

Derivation of Helmholz wave Equations. Solution to Wave Equation. Wave propagation in Losy lossless dielectrics plane wave in free space poynting Vector Poynting Theorm.

Polarization of

Emulave, Reflection and Refraction of planewave of normal and oblique incidence on conductors and at the interface between two dielectrics, Brewsal angle Total Internal Reflection.

Transmission Lines :

Transmission Line Parameters, Transmission line equation, Input Impedence, SWR, and Power. The Smitch Length of line at UHF, Single Stub Matching.

Antennas :

Concepts of Radiation. Herfzian Dipole, Half-wave Dipole, Radiation Resistance Radiation Pattern, Gain of Antenna.

TEXT BOOKS :

1. Elements of Electromagnetic By M.N.O. Sadiku, Second Edition. Oxford Chapters 2-11, & Portion for chapter 13.
2. Engineering Electromagnetic - Hyat.

REFERENCE BOOK :

1. Electromagnetic Waves & Radiating System By Jordan & Balamicn.

6th Semester

(ELECTRONICS & TELECOMMUNICATION ENGG.)

EE. 601 CONTROL SYSTEM ENGINEERING - 1 F.M. - 80

(Common to EE, EC, EI and CS)

Introduction :

Basic concepts of Control Systems, Classifications, Servomechanism and Regulars.

Depreciation of Physical System :

Differential Equations of Physical Systems, Transfer function Block Diagram, Algebra Signal Flow Graoph Gain Formula, Application of Signal Flow Graphs to Control System.

Feedback Theory :

Feedback and non-feedback Systems, Reduction of parameter variations by use of feedback, Control Effects of Disturbance Signals by use of Feedback, Regenerative Feedback.

Contror System & Components :

Electrical System : A.C Servometer, D.C. Servometer, A.C.Tachometer, Amplidyne, Synchros, A.C. Posilion Control System.

Stepper Motor : Use of Stepper Motors in Control Systems.

Time Domnin Analysis, Design Specifications & Performance Indices

Sturxiard Test Signal : Step Ramp, Parabolic, Impulse.

Time Response of First-order System : Response to the Unit Step Input. Response to the Ramp Input.

Time Response of Second-order Systems : Response to the Unit Step Input time Response specifications.

Steady State Error and Error Constants and the generalized error series.

Type of Feedback Control Systems.

Concepts of Stability :

The Concept of Stability, necessary Conditions for Stability. Hurwitz Stability Criterion Routh Stability Criterion

Application of Routh Stability Criterion to Linear Feedback Systems.

Root Locus Techniques :

Root Locus Concept, Construction of Root Loci, Construction Rules, Determination of Roots from Root Locus, root Contours, Systems with Transportation Tab, Sensitivity of the Roots of the Characteristic.

Equation :

Root Sensitivity to Gain, Root Sensitivity for Small Parameter changes.

Frequency Domain Analysis :

Introduction Bode Diagrams, Polar Plots, legmagnitude versus Phase Plots. Nyquist stability criterion, Stability Analysis, Relative Stability.

Closed Loop Frequency Response :

Constant M-Circles, Constant N-Circles, Nichols Chart, Use of MATLAB for performance studies.

REFERENCE BOOKS :

1. Control System Engg. : I. J. Nagrath & M. Gopal, New Age Intemstional (P) Ltd. 2nd Edn., 1996

Sections : 2.2. to 2.5, 3.1 to 3.5, 4.3 to 4.4, 5.2 to 5.5., 6.1 to 6.4, 7.2 to 7.6

2. Modern Control Engg. : K. Ogata, PHI, 3rd Edn., 1997
   Sectrions : 4.3, 8.1, 8.2, 8.6 to 8.10
3. System Dynamics & Control : Eronini Umez-Eronini, 1999 edn., PWS Publishing. Internationa Thompason publicing company.

CS 606 SYSTEM SOFTWARE F.M. - 80

Prerequisite :

Knowledge of some high Level Programming Language.

Introduction :

Evolution of the Components of a programming systems, Evolutions or OS.

Machine Structure, Machine Language & Assembly Language : General machine structure, Concepts of Machine Language & Assembly Language.

Assemblers :

General design procedures, design of Assembler.

Macro Language & Processor :

Macro Instruction, Facility

Loading : Different Loader Scheme.

Design of direct linking loader

Formal System & Programming Language, Introduction. grammars, Hierarchu Languages, Backus Normal

Compliers : Phases of compiler

Operating Systems : Concept, Evolutions, process management, Memory Management.

TEXT BOOKS :

1. System Programming : J. J. Donovan
   Chapters 1, 2, 3.1, 3.2, 4.1, 4.2, 5.1, 5.3, 7.1, 7.2, 7.3, 7.4, 7.5, 8.1, 8.2, 9.1, 9.2, 9.3.

REFERENCE BOOKS :

1. System programming & Operating system : Donovan
2. Operating Sysytem Concept : silberschiaz Galvin
3. Compiler Construction : Aho & Ulluman

EC 601 ADVANCED MICROPROCESSORS F.M. - 80

1. System design (using Intel 8086)

Pins and signals, 8086 basic system Concept, Interfacing witn memories, 8086 programmed I/O, 8086 interrupts, 8086 DMA, 8086 I/O Processor.

2. Intel 8086 :

Introduction , Architecture, 80826 Memory Management unit, protection Modes, pins & Signals : Co-processor.

3. Intel 80386 :

Introduction Architecture, Pins & Signals, 80386 protection mode operation, segmentation and virtual memory Interrupt & exception handing task switching paging mode , instruction set. 80387 co-processor.

4. Intel 80486 :

Introduction Architecture, Pins & signals, 80486 protection mode, segmentation and Interrupt paging, instruction set.

5. Pentium Processor :

Instruction Architecture, performance, Organization, Integer / Floating Point, Pipeline, Superstar execution, branch prediction & handling, Cache Organization, Safe instruction Recognition.

Transcendal instructions, Instruction set, Technology & Compatibility.

TEXT BOOK :

1. Microprocessors And Interfacing; programming and hardware : by Douglas V.Hall, TMH, New Delhi, Third Edition - 1999.

EC 602 DIGITAL SIGNAL PROCESSING F. M. - 80

(Common to EE, IT , & CS)

1. Discrete - time signals and systems :

Discrete time signals, some example and classification

Descrete time systems classification : Static dynamic systems non linear systems, casual, non casual system.

Unstable system, interconnection of discrete time systems, graphical computation of convolution, properties of convolution, properties of convolution, recursibver

and non recursibve discrete-time systems with examples linear time invarant system, solutions of linear constant coefficient difference equations, impulse response of LTI system, Implementation of descrete time systems, direct from-I and direct form-II, circular convolution and correlation, Cross Correlation, Linear convolution : overlap save and Add method.

2. Discrete fourier transform :

The discrete Fourier Transform (DFT) and its inverse, properties, radix-2 fast Founer Transform (FFT). Decimation in time (DIT) decimation in frequency (DIF), computation of IDFT by derect DFT, computation of complexity, computation of circular and linear convolution by DFT method .

3. Design of finite impulse response digital filters :

Introduction, Window function, design of low pass, high pass, all pass and band reject filters using windows, frequency sampling technique design examples.

4. Design of finite impulse response digital filters :

Introduction, design with impulse unvariant transformation, design with bilinear transformation.

5. Power spectrum estimation :

Estimation of auto correlation and power spectrum of random signals, use of DFT in power spectimation, parametric method the Burg method for the AR model parameters, least for power spectrum estimation.

6. Introduction to adaptive systems :

Adaptive filters, adaptive system identification, adaptive channel equalization, adaptive line enhuncern

TEXT BOOKS :

1. Digital signal processing : Principles, Algorithms and Applications
By J. G. Proakis, PHI (Selected portuins from Chapters 5 and 6)

2. Introduction to digital signal processing :
By J. R. Johnson, PHI (Selected portions frm Chapters 5 and 6)

3. Adaptive signal precessing :
By B.Winsow, Prentice Hall, INC. (For Chapters 6 only)

EC 603 POWER ELECTRONICS F. M. - 80

(Common to EE, EC & EI)

Power Semiconductor devices :

Construction and Principles of operational of thyristor, Statin V-I characteristic of SCR, DIAC, TRIAC and Turn-on and Turn off mechanism and gate characteristics, device specifications and rating. Thermal Character cooling and mounting devices, Series and parallel connections, Thyristor protection circuits, design of snubber circuit.

AC/DC Controlled Converter (Controlled Rectifier) :

Single phase circuit configuration and principle of operation of half-wave, full-wave (full control and half controlled rectifier, Average output voltage and current and waveforms of voltage, current for R, RL and load, Effevt of sourve and load inductancewith and without free wheeling diode, power factor in AC side and R-L load, Displacement factor and Ripple factor.

Three Phase :

Half wave and full wave bridge (six pulses) controlled rectifier, Three phase half controlled bridgecon waveform of output voltage and current for R and RL load, Average output voltage and current for R and RL.

Inverter (DC/AC Controlled Converter) :

Principle of line communication and forved communication, Classification of circuits for forved commutation (i.e Resonant commutation, self commutation, Axulary commutation, Complimentary commutation. Extrernal commutation and line commutation). Parallel inverter : Basic circuit operation without and with free wheeling diiodes, output voltage and current waveforms. Frequency limit, singlephaseseries inverter : Circuit description and principle for simple and improvedcircuit, Frequency limit.

Single phase bridge inverter : Principle of bridge inverter, principle of MaMsrray bedform & McMurry Commutated inveters, Communication process.

Three Phase Bridge Inverter :

Concept of voltage source (voltage driver) and curent source (current driver) Mcmurray bedform inverter and current sources, Principleof operatioj of voltage source inverter and current source waveforms of output voltage and current for R and RL load.

Triggering Circuits :

Types of SCR triggering schemes : DC, AC and pulse trigger

Triggering scheme for AC/DC controlled converter .

i) UJT triggering scheme : Designing of triggering scheme of single phase AC/DC conveter using UJT.

ii) RC phase shift triggering scheme.

iii) Cosine Law triggering scheme.

Triggeruing circuits for inverter , single phase and three phase

DC Chopper :

Basic principle and basic circuit (Oscillating chopper, Jones chopper, Morgan chopper) Mark space and frequency control, Load commutared chopper.

Cycloconverter :

Basic principle of single phase cycloconverter, Frequency changer, Singlephase circuitstenuo cyclocoonverter :Mid point cycloconverter , bridgetype cycloconverter.

Three phase halfwavecycloconverter : Three phase to single phase and three phase to three phase cycloconverter

AC power controller :

Principle of on / off control, Principle of Phase control, Single Bidirectiional Controllers with insective Three phase halfwove with resitive load, single phase Controller with inductive loads Three phase halfwave controllers, Three phase Fullwave controller. AC power controller using TRiac Rs and RL load.

REFERENCE BOOKS :

1. Power electronics; P. C. Sen, TMH
2. Thyrstorised Power Controllers : G. K. Dubey etal. Wiley Eastern Ltd.
3. Prof inverter Circuits : Bodford & Hoft
4. Power Electronics : C. W. Laander
5. Power Semiconductor Circuits : SB Dewan & A. Stramgher.

DRIEMS

Courses of Studies for 7th & 8th Semester for Electronics & Telecommunication Engg.

UTKAL UNIVERSITY

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COURSES OF STUDIES FOR ELECTRICAL ENGINEERING

7th Semester

COURSE NO.	SUBJECTS	TOTAL MARKS	DURATION UNIV. EXAM.	LECTURE HRS. PER WEEK
1	2	3	4	5
THEORY				
EC701	Integrated Circuits & VLSI Design	100	3	4
EC 702	Data Communication & Computer Networking	100	3	4
EC 703	Communication Systems	100	3	4
EC 704	Microwave Engg.	100	3	4
	Elective - I	100	3	4
	Total	500		
SESSIONALS				
EC 705	Communication System Lab.	100	—	6
EC 706	Electronic Design Lab.	50	—	3
EC 707	Project	50	—	3
	Total	200		
ELECTIVE-I				
EC 708	Wave Propagation & Antennas			
EC 709	Radar & TV Engg.			
EC 710	Computational Intelligence			
EC 711	Material Science & Technology			
EC 712	Waveguides and Antennas			

8th Semester

COURSE NO.	SUBJECTS	TOTAL MARKS	DURATION UNIV. EXAM.	LECTURE HRS. PER WEEK
1	2	3	4	5
THEORY				
EC 801	Mobile Communication	100	3	4
IT 801	Management of Information System	100	3	4
	Elective - II	100	3	4
	Elective - III	100	3	4
	Total	400	3	4
SESSIONALS				
CS 804	Computer Networking Lab.	50	—	3
IT 702	E-Commerce Lab.	50	—	6
EC 802	Project	100	—	6
EC 803	Seminar	50	—	3
EC 804	Grand Viva	50	—	3
	Total	300		
EIECTIVE - II				
IT 701	Internet & Web Technology			
IT 808	Multimedia Technology			
EC 806	Image Processing & Computer Vision			
EC 807	Biomedical Engg.			
CS 807	Advanced Operating System			
ELECTIVE-III				
ME 801	Industrial Management			
HU 802	Communication Skill			
HU 803	Industrial Psychology & Behavioural Sc.			
HU 804	Free Market Economy			
ME 813	Total Quality Management			

SEVENTH SEMESTER

(Electronics & Telecommunication Engg.)

EC 701 INTEGRATED CIRCUITS AND VLSI DESIGN

FM 80

A. Integrated Circuits **(30 Marks)**

IC Op-Amps : Different stages. Motorola MC 1530 Op-Amp - Circuit Layout, DC analysis. Application of Op-Amps in Waveform generators Square, triangular & Sinusoid, Active Filters first and Second order, Phase Locked Loop, D/A and A/D Converters.

Text Book :

Linear Integrated Circuits By D.Roy Choudhury & Shail Jain, New Age Int. (P) Ltd. June 1998.

Selected Portion from Chapters : 5,7,8,9 and 10.

Reference Book : Op-Amps and Linear Integrated Circuits By R.A.Gayakwad.

B. VLSI Design : **(50 Marks)**

Basic of MOS Transistor : nMOS, CMOS, BiCMOS - Their Fabrication Technology, Production of E-beam Masks.

Basic Electrical Properties of MOS and BiCMOS Circuits : Threshold voltage gm, figure of merit The nMOS CMOS and BiMOS inverters. Pull-up to pull down ratio, Latch up.

MOS and BiCMOS Circuits Design Processes : MOS Layers, Stick Diagrams Design rules and layout, 2m double metal, doublepoly, CMOS/BiCMOS rules, Layout Diagrams, translation to mask form.

Basic Circuits Concepts :

Sheet Resistance Rs, layer and wiring Capacitance, Propagation delays, Driving large capacitive loads.

Scaling of MOS Circuits : Scaling Models and Scaling factors, Scaling factor for various device parameters. Limitation of Scaling, Various other Limitations.

Sub System Design and Layout :

Architectural issues, pass transistors and transmission gates, the Inverter, Two-inputs nMOS, CMOS, BiCMOS, NAND gates & NOR gates, Parity generators, multiplexers, A four line Gray Code to Binary Code Converter, Two-phase Clocking, a Dynamic Shift Register. Power dissipation.

Sub System Design Processes :

General considerations, an illustration of Design Process : Design of a 4-bit Shifter, Design of an ALU sub system- Design of 4-bit adder, The Manchester Carry-chain. The Serial-Parallel multiplier, Two's complement multiplication, a pipeline multiplier array.

Memory, Resisters and aspects of system timing :

System Timing Consideration. Some commonly used storage / memory elements - CMOS Memory Cell, J-K F/F, D F/F arrays of Memory Cells, RAM arrays. An introduction to Ultra fast VLSI Technology.

Text Book :

Basic VLSI Design By D.A. Pucknell & K.Eshraghian 3rd Edition - PHI.

Selection portion from Chapter 1 to 9.

Reference Book :

VLSI Design Techniques for Analog and Digital Circuits AR.L. Geigeretc. Mc. Graw Hill (International) 1990.

SEVENTH SEMESTER

(Electronics & Telecommunication Engg.)

EC 702 DATA COMMUNICATION AND COMPUTER NETWORKING

(Common to CS, IT, EC & EE)

FM 80

DATA COMMUNICATION :

An overview of Analog and Digital data transmission, transmission impairment, transmission media such as twisted pair, Co-axial Cable and Optical fiber and Wireless Transmission.

Data Encoding :

Digital Signal encoding formats, their typical features and performance. Encoding rules for B 8ZS and HDB 3. Digital data Analog transmission - Ex transmission through public telephone System. Encoding technique ASK, RSK, PSK. Their Performance.

Analog data-Digital Signals : A case of PCM. Performance

Data Communication Interface :

Asynchronous and Synchronous transmission, Typology, Full and Half Duplex, Modems. V.24/EIA-232-E standard.

Data Link Control :

Stop-and-Wait flow control, Sliding-window flow control. Error.

Detection Error Control :

Stop-wait ARQ, Go-back-NARQ. HDLC, LAPB, LAPD and ATM data link control protocols.

Multiplexing : FDM and Synchronous TDM.

COMPUTER NETWORKS :

Wide-Area Networks : Circuits Switching, Switching Nefworks, space division Switching, Time-Division Switching, Routing, Control signalling. Packet Switching-Principles, Routing, Congestion Control, x. 25 protocol.

France Relay :

Protocol & Architecture. General functioning, congestion control. Asynchronous Transfer Mode (ATM): Protocol and Architecture, ATM Logical connection. ATM Cells.

Local Area Networks :

LAN architecture, BUS, Tree, Ring, Star and Wireless LANs. LAN Systems: Ethernet, Token Ring and FDDI. Bridge Operation of LANs.

Protocols and Architectures :

Protocols and their Functions. OSI Model, OSI Layers. TCP/IP Protocol Suite architectures, operations and application. A brief Introduction to Internet working.

Text Books :

1. Data and Computer Communication
   William Stallings. Fifth Edition, PHI
   Selected Portion for the Chapters I-16
2. Compute Networks - A.S. Tannenbum

SEVENTH SEMESTER
(Electronics & Telecommunication Engg.)
EC 703 COMMUNICATION SYSTEMS

FM 80

Communication System and Noise Calculation :

Resistor Noise, Network with reactive Elements. Available Power, Noise Temperature, Cascaded two-ports. Noise Bandwidth, Effective Input Noise Temperature. Noise Figure and Equivalent Noise Temperature of a Cascade. An Example of A receiving System. Antenna Temperature, System Calculation.

Baseband Transmission, Line Coder/decoder implementation, Clock Extractor Circuits, Data Regenerator.

Data Communication Protocols, Modems and implementation, Bandwidth Efficient Modems (V.32 modem). Digital Subscriber Loop (XDSL) Hybrid fibre Co-axial Modem)

Fibre Optic Communication System :

Optical Sources - LED, LASER. Optical Detectors-photo detectors, PIN/APD.

Optical Fibre - Monomode and Multimode.

Attenuation, dispersions in optical fibres. Concept of Km-Bandwidth. Fibre jointing, Splicing, bending, cabling Optical Amplifiers, Repeaters.

Optical communication system Design :

Design of Transmitter, Receiver and link. Wavelength Division Multiplexing. Sub Carrier Modulation (SCM) for distribution Network WDM Network, SONET/FDDI.

Optical communication system Design :

The Statellite Orbit, Geosynchronous and LEO Orbits. The Satellite Position, Uplink, downlink and Cros-Link. Assignable Satellite Frequencies. The Transpondder, The Antenna Systems, The Power Package, Station keeping. Forms of Modulation, Free-path space losses, the Ground station, aligning the Satellite Dish.

Description and special features of ISDN/DISDN/ATM Networks/IP/TCP-IP.

Suggested Books :

1. Principles of Communication Systems By Taub & Schlling.
   Chapters 14
2. Communication System - Modulation and Noise By R.J.Schenbeck Prentice Hall.
   Chapters 14, 16.

3. Optical Communication system By D.C. Agarwal, Wheeler Publication.
4. Communication System By G.Kennedy.
5. Modern Digital and Analogue Communiccation Systems : Third Edition By B.P. Lathi.
6. Communication System By Simon Haykin.

SEVENTH SEMESTER
(Electronics & Telecommunication Engg.)
EC 704 MICROWAVE ENGINEERING

FM 80

Sources :

Klystron, Velocity diagram, Analysis for Electronic Admittance, Modes of Oscillation, Resonant frequency, electronic tuning, Performance as a Microwave source.

Travelling Wave Tube :

Principle of Operation, simple analysis of Electron-field interaction. Performance as a Microwave source.

Magnetron :

Principle of operation, Multicavity magnetron, II-mode.

Solid state Microwave source : Principle of Gum Diode oscillator Gunn Effect.

Transmission Line :

Transmission Line Equation and Solution Reflection and Transmission Coefficient, Characteristics Impedance, Input Impedance, Stub Matching. Solution of wave equations, mode in Co-axial and Rectangular waveguide. Field distribution in dominat mode. Analysis and Design of co-axial and Rectangular wave guide. Attenuation in Waveguide. Introduction to strip and Microstrip lines.

Microwave Plumbing :

Principle of operation, simple analysis and Device Characteristics of Attenuator Directional coupler, Isolator, Quarter wave transformer, wave guide resonator Loops and Probes, Movable short, matched load, Co-ax to wave guide transition. Concept of Return loss.

Antennas :

Principle of operation and simple performance analysis of Horn antennas, Slot and slotted wave guide array antennas, Parabolic Reflector Antenna.

Propagation of Microwave :

Line of sight propagation, path effects on polarization, attenuntion and fading of Microwave signal.

Microwave Receiver :

Description of Block Schematic diagram. Noise Figure. Principles of operation of a Low Noise Amplifier, Microwave Detector.

Microwave Measurement :

Measurement of Microwave Power, Polarization, Impedance, Radiation Pattern and gain of an antenna.

Text Books :

1. Microwave Devices and Circuits - Samuel Y.Liao third Edition Selected portion for Chapter 3,4,7,9,10 and 11.
2. Principle of Microwaves - Reicke and Four Authors.

SEVENTH SEMESTER
(Electronics & Telecommunication Engg.)
EC 708 WAVE PROPAGATION AND ANTENNA

FM 80

Ground Wave Programme :

Plane-earth Relection. Space Wave and Surface wave and Surface wave : The Surface Wave, Elevated Dipole Antenna above plane earth, wavetilt, Spherical earth propagation, Tropospheric wave, Formation of duct, Duct propagation Troposcatter Communication. Ionospheric Propagation.

The Ionosphere : Effective ϵ and σ of an ionized gas, formation of E, F, C and D Layers, Reflection and refraction of waves by the inosphere, Virtual height, Critical frequency, MUF, Skip Distance, Ionoshere Sounding Attenuation factor for Ionospheric Propagation., Regular & Irregular Variations in the ionosphere, sky-wave transmission Calculations. Effect of Earths Magnetic field, Faraday Rotation.

Microwave and Millimetre Wave Propagation :

Attenuation by Rain Fog, Snow, Ice. Attenuation by Atmospheric Gases, Scattering by Rain. Extremely high very high frequency propagation.

Antennas :

Log Periodic, Reflector Antenna : Front Fed.

Parabolic Reflector, Cassegrain Reflector, their principle of operation, Analysis and Application.

Text Books :

1. Electromagnetic Waves and Radiating Systems - By Jordan & Balwain Chapter : 16 & 17.
2. Antenna Theory By C - A Balanis, John Wiley & Sons.

Reference Book :

1. Antennas & Radio Wave Propagation By R.E.Collins. Mc Graw Hill. Co.

SEVENTH SEMESTER
(Electronics & Telecommunication Engg.)
EC 709 RADAR AND TELEVISION ENGINEERING

FM 80

A. Radar System :

The Radar Equation, Prediction of Radar performance, Basic knowledge about Receiver noise, probability-Density function, Prob. of false alram; Prob. of Detection, SNR, Integration of Radar Pulse, RCS of Targets, Pulse Repetition frequency and

Range ambiguities, System lossers and propagation effects.

Frequency Modulated CW Radar :

The Doppler Effect, Block Schematic and principle of operation, beat frequency, Altimeter.

Moving Target Indicator (MTI) Radar :

MTI with Power Amplifier Transmitter, MTI with Power Oscillator Transmitter, Delay line Canceller, Multiple and staggered PRF, subclutter visibility.

Tracking Radar :

Sequential Lobbing, Conical Scan and Movopulse.

Brief Instruction to electronics Scanning Radar System.

B. TELEVISION ENGINEERING

1. Principles of Television scanning, Bandwidth Calculation, Brightness, Contrast resolution, Spurious signal & other performance criteria.
2. Camera tubes : Orthicion, Image - Orthicion & vidicon Image reproducting tubes, silicon diode arrays, image sensor.
3. Composite video signals blacking and synchronizing standards, composite video signal generator, vestigial sideband transmission, carrier transmission of picture and sound signals, VSO filters Video recording and reproduction.
4. TV transmitters and Receivers : Block diagram and description of TV Transmitters, standard TV channels RF systems, Video systems DC Restoration circuits, TV transmitting antennas, block diagram and description of TV receivers, Receivers sweep circuits and synchronization, separation of audio and video signals, video amplifiers, receiving antennas.
5. Colour Television : Colour quantities, the trichromatic system, colour TV standards and practices, Colour TV transmitters and receivers, shadow mask and chromotron colour picture tubes Elementary idea of cable television.

Text Books :

(For Radar Portion)

1. Introduction to Radar System
   By M.I. SKOLNIK
   Selected portion form Chapters 1,2,3,4 & J.
   (For Television Engineering)
2. Television Engineering
   By A.M. DHAKE
   Publisher : Tata Megrow Hill
   Selected Portions

Reference Book :

Monochrome and Colour Television.
By R. R. Gulati.
Publisher : Willy - Eastern Co.

SEVENTH SEMESTER
(Electronics & Telecommunication Engg.)
EC 710 COMPUTATIONAL INTELLIGENCE

FM 80

Introduction to Neuro-Fuzzy and Soft Computing

A) FUZZY LOGIC

1. **Fuzzy Set Theory :**
   Basic definition and terminology, set theoretic operations MF formulation and parameterization, MF of two dimension, Fuzzy union, intersection and complement.
2. **Puzzy rules and fuzzy reasoning :**
   Extension principle and fuzzy relations, fuzzy if then rules, fuzzy reasoning.
3. **Fuzzy Interence System :**
   Introduction, Mamdani fuzzy models, other variants, Sugeno fuzzy models, Tekamoto fuzy models.

B. ARTIFICIAL ALGORITHMS :

1. Introduction, Architecture, Back propagation and feed forward nteworks, Offline learning, online learning.
2. Supervised learning of Neural Networks : Introduction, perceptions, Methods of speeding.
3. Radical Basis function networks, Kohonen expansional networks.
4. Unsupervised Learning : Competitive Leaning Network, Kohonen self-organising networks Hebbian learning, the Hopfield network.

D. NEURO FUZZY MODELLING :

Introduction, Adaptive Neuro-fuzzy Inference System (ANFIS), Architecture and learning algorithm, simulation examples : Modeling of a 2 inputs Sinc function, online identification of control systems, Introduction to Neuro fuzzy control.

Text Book :

Neuro-Fuzzy and Soft Computing by J.SR Jang, C.T.Sun and E. Mizutani PHI. (Selected portion from Chapters 1,2,3,4,7,8,9,12 and 18.

SEVENTH SEMESTER
(Electronics & Telecommunication Engg.)
EC 701 CONTROL SYSTEM ENGG. - II
(Common to EE, EC, EI & CS)

FM 80

Controllers :

Basic Control Action : Classifications of Industrial Controllers, Proportional, Integral, Proportional-plus-Integral, proportional plus-Derivative. Proportional-plus-Integral-plus-Devivative Control Action.

State Variable Analysis :

Mathematical Modelling of Dynamic Modelling in State Space, State Space Representation of Dynamic Systems, Mechanical Systems, Electrical Systems, State Space Representation of Transfer Function System, Relationship between State Equations and Transfer Functions. Characteristic Equation, Eigen Values and Eigen Vectors. Solution of the Time-Invariant State Equation.

Determination of State Transition Matrix :

Use of Clayey-Hamilton Theorem, Minimal Polynomia, Sylverster's Interpolation.

Controllability, Absorbability.

Design of Control Systems :

Introduction of Design of Control Systems in State Space. Design of phase lead and phase lag Controller in Time and Frequency Domain, Pole Placement, State observes.

Sampled Data Control Systems :

Transfer Functions of Discrete-Data Systems : Pulse-Transfer, Z-Transfer Function. Transfer Functions of Discrete-Data Systems with Cascade Elements.

Transfer Functions of Zero-Order Hold.

Transfer functions of Closed Loop Discrete Data System Equations of Linear Discrete Data Systems : Discrete State Equations.

Solutions of the Discrete State Equations :

Discrete State-Transition Equations. Z-Transform solution of Discrete State Equations : Transfer-Function Matrix and the Characteristic Equation. Stability Tests of Discrete State Equations : Bilinear Transformation Method, Direct Stability Tests.

Non-Ninear Systems :

Common Physical Non-Linearities, The Phase-Plane Method : Basic concepts, Singular Points, Stability of No-linear Systems, Construction of Phase Trajectories, Constructions by Analytical Method, Construction by Graphical Method, System analysis by Phase-Plane Method. The Describing Function Method : Basic Concepts, Derivation of Describing Functions for common non-linerities. Stability Analysis by Describing Function Method, Jump Resonance. Liapunov's Stability Criterion, Popov's Stability Criterion.

Sampling & Signal Reconstruction :

Definition of Z-Transform, Evaluation of Z-Transform, Properties, Inverse Z-Transform, Mapping between s-plane and z-plane, System description by Difference Equations.

Reference Books :

1. Modern Control Engg. : K.Ogata, PHI Pvt. Ltd. 3rd Edition, 1997
   Sections : 5.2; 3.4 to 3.7; 11.2 to 11.7; 12.1, 12.2, 12.5
2. Automatic Control Systems : B.C. Kuo, PHI Pvt. Ltd., Edition, 1995
   Sections : 3.11, 3.11.1 to 3.11.3; 5.14.1 to 5.14.2; 5.15.1; 6.7.1, 6.7.2
3. System Dynamics & Control : Eronini Umez-Eronini, 1999 Edition.

SEVENTH SEMESTER

(Electronics & Telecommunication Engg.)

EC 712 WAVE GUIDES AND ANTENNAS

FM 80

Waveguides :

1. **Co-axial Waveguide :** Simple analysis, Field distribution, power flow and cut off frequency of dominant TEM mode. Characteristics impedance and cross sectional dimensions.
2. **Rectangular Waveguide :** TE and TM mode field, guide wave length, cut off frequencies, phase and group velocities and wave guide impedances. Dominant mode and its fields and current distribution Calculation of attenuation and phase shift constant. Design of rectangular wave-wave-guide to supports dominants mode only.
3. **Cylindrical Waveguide :** TE and TM mode fields, dominant mode, cut off frequency. Designing a circular cylindrical waveguide to support dominate mode only.
4. **Antennas :** Principles of radiation, Retarded Vector magnetic potential for sinusoidal oscillation, Radiation field from a current element, Radiation resistance, Current distribution on a thin wire, Radiation form half-wave dipole/ Quarter-wave monopole and their radiation pattern and radiation resistance.
5. Two-element array, Principle of Pattern multiplication. Linear array of N-elements, Broad side and end fire patterns and their side lobes and position of nulls. Antenna gain, effective length, input impedance, methods of excitations, Balum. Folded dipole and Yogi antenna.
6. Secondary Sources and aperture antennas. Magnetic currents, duality, Principle of images. The Equivalence theorem Radiation form Huygen's sources. Radiation from the open end of a Co-axial line, aperture in an absorbing screen, Radiation through an aperture in a perfectly conducting Screen. Babinet's Principle: Complementary Screen. A thin slot in an infinite Screen. Principle of Parabolic Reflector antenna and Pyramidal Horn Antenna and their radiation Pattern.
7. Induced e.m.f. method for calculating impendance of wire antenna. Mutual impedance between two dipoles.
8. Antenna Measurements : Measurements of Radiation Pattern, gain and input impedance.

Text Book :

Electromagnetic Waves and Radiating Systems'

By Jordan and Balmain.

Reference Books :

Antenna Theory By C.A. Balanis.

EIGHTH SEMESTER

(Electronics & Telecommunication Engg.)

EC 801 MOBILE COMMUNICATION

FM 80

Mobile Communication Principle :

Cellular Concept, System Architecture, allocated spectrum, utilization. Frequency reuse, Channel assignment strategies, co-channel Interference and System Capacity, Power Control Cellular system Capacity improvement, Cell splitting, Sectioning, Microcell Zone concept.

Propagation and Multipath Models :

Impspheric absorption, attenuation due to Rain, Fog and Snow, Scattering and Diffraction by high-rise structures. Multipath fading, Shadowing and path loss. Doppler and time delay spread.

Modulation Technique :

Basics of Modulation Techniques suitable for Mobile Communication. Spectral Efficiency; Details of GMSK and 4DQPSK.

Tech Coding Techniques :

Interview of Coding theory, Spread Spectrum Principle, CDMA. Diversity Technique.

Multiple Access Techniques :

Description of FDAM, TDMA, CDMA and SDMA Systems. Capacity Comparision.

Description and Special feature of GMS and CDMA and TDMA Systems.

Mobile Data Communication and Technique, Wireless Data Services.

Mobile Satellite Communication.

Mobile IP/ATM/Multimedia

Mobility management

Mobile Communication Evaluation and Standards.

Suggested Books :

Wireless Communication - Principle and Practice By Theodore S.Rappaport. Prentice Hall.

Mobile Cellular Telecommunication By Willam C.Y.Lee. Mc Graw Hill.

Wireless and personal Communication System By V.K. Garg and J.E. Wilkes IEEE Press.

EIGHTH SEMESTER

(Electronics & Telecommunication Engg.)

IT 801 MANAGEMENT INFORMATION SYSTEM

FM 80

1. **Management and Systems :** Concept and Definition of MIS, the System approach, the Systems View of Business. MIS Organisation within the company. Development of Organizational Theory, Management and Organizational behaviour. The

Manager and his knowledge about Data Processing and Computer, operation of Manual Information System, Conversion of Manual to Computer-based Information Systems, the Concept of Databank and Types of Computer-based Application.

Database Management : The Business Setting objective of DBMS, Database Technical overview, Management Responsibility. Information Systems for Decision making: Evolution of an Information System, Basic Information Systems, Decision making and MIS, MIS as a technique for making Programmed decisions, Decision-Assisting Information Systems.

2. **Planning for, Designing and Implementing the MIS :**

Strategic and Project Planning for MIS : general Business Planning, Appropriate MIS Response, MIS Planning.

Conceptual System Design : Definition of Problems, Setting System Objectives, Establishing System Constraints, Determination of Information needs and Information Sources. Developing alternative Conceptual Design; Documenting the System Concept and preparing the Conceptual Design Report.

Detailed System Design : Need for involvement of Organisation, Aim of Detailed Design, Project Management of MIS Detailed Design, Dominant and Trade off Criteria, Define the Subsystems, Detailed operating Subsystems and Information flows, Degree of automation of each operation, Inform and Involve the Organisation again, Input, Output and Processing, Software, Hardware and tools. Documentation of the Detailed Design.

Implementation, Evaluation and Maintenance of MIS : Organise and develop procedures for Implementing, Training of the operating personnel, Computer related Acquisition, Developing form for Data Collection and Information Dissemination, Developing the Files, Test the System, Evaluate the MIS. Control and maintain the systems.

Case Studies.

Text Books.

1. Information System for Modern Management : by Robert G. Murdich, Joel E.Ross and James R.Claggett, Prentice Hall of India 1999. Selected portion from Chapter 1 to 10 and any one case studies in pages 409 to 452.
2. Management Information Systems : By G.B.Davis and M.H.Olson, 2nd Edition, Mc Graw Hill International Edition.
3. Information System Analysis & Design : Ram Bansal 'Vigyacharya' Publisher : New Age International

EIGHTH SEMESTER

EL-1

(Electronics & Telecommunication Engg.)

IT 701 INTERNET AND WEB TECHNOLOGY

FM 80

Graphical User Interface :

GUI concepts and an introduction to MS-Windows components - Mouse & Keyboard message - Window concepts : Static controls, button controls, List boxes & Combo boxes-Scrolling features - Edit controls - the child window Menus.

Exposure To Internet :

Internet Introduction, Basic components and its terminology - World Wide Web-Getting Connected to host-Web Page and HTML - net surfing - Web browsing - Browers - Internet Addressing.

Internet Protocols :

Internet Protocols : ICP/IP, FTP, HTTP, Tenet-Web Searching, Web Index, Search Engineers, E-mail, Mailing Lists - Smileys, E-mail pros and cons.

Web Page Design :

Creating Web pages using HTML, Java & VB scripts and different components like hover buttons and Spread sheets etc.

Java :

Its environment, Threads, Multiple Threads, Compiting and executing a JAVA program - Input/Output methods - Classes - Instance - Data types, Operator, Arrays, String & String Buffer.

JAVA - Enhanced Utilise :

Applets - Preparing a JAVA program for the Web Error Handling-Multitasking in JAVA - Introduction to JAVA Utilities Introduction to JAVA Script.

Text Books :

1. Internet for Every one 1997. Vikas Publishing - Leon & Leon.
2. Java essentials for C/C++ programmers, 1996, Addition Wesley-Barry Boone.

Reference Books :

1. The Waite Group's Windows Programming Premier Plus-Conger Jim, 1992, Galgota.
2. The Whole Internet - User's Guide & Gatalog - 1993, O'Relly & Associates.
3. Java - 2 Complete Reference Peter Norton
4. The complete Reference Millennium Edition - Margaret Levine Young.
6. Web Design In a Nutshell - O'Reilly.

EL I

EIGHTH SEMESTER

(Electronics & Telecommunication Engg.)

IT 806 IMAGE PROCESSING & COMPUTER VISION

FM 80

Introduction to Image Processing :

Problems and application, Image representation and modeling, Image enhancement, Image restoration, Image analysis, Image reconstruction form projections, Image data compression (Brief idea about the above topics).

Two Dimensional system and Two Dimensional Fourier Transform :

Notatons and definition, Linear system invariance, The Fourier Transform, Properties of Fourier Transform, Spatial frequencies, Uniqueness, Separability Hankel Transform sequences, Causality and stability, OTF and MTF, Vectors and matrices, Row and column ordering Teoplitz and circulant matrices.

Image Transform :

Introduction The two dimensional DFT, Cosine Transform, Handamard Transform, The Haar Transform, The Sine Transform (Elementary ideas)

Image Enhancement :

Introduction, Contrast Stretching, Clipping and thresholing, Digital negative transformation, Intensity level slicing, Bit extraction, Range Compression, Image subtraction and change detection, Histogram modeling, Histogram modification. Histogram Equalization and specification, directional smoothing, Median Filtering, Unsharp masking and crispening, Colour image enhancement.

Image Analysis and Computer Vision :

Introduction, spatial feature extraction, transform features, Edge Detection, Gradient operator, Compass operators, Laplace operators and zero crossings, Performance of edge detection operators, Line and spot detection, Contour following, Connectivity, Edge linking and Heuristic graph searching, Hough Transform.

Books :

Fundamentals of Digital Image Processing By A.K. Jain PHI Ltd. 1999.

EIGHTH SEMESTER

ELI

(Electronics & Telecommunication Engg.)

CS 807 ADVANCED OPERATING SYSTEMS

FM 80

Aquisites :

Concepts conventional OS & Computer Networking

Opt of Advanced Operating Systems :

Outed Computing systems, Models of DCS (Distributed)

Outed OS as Advanced OS, Issues in designing distributed Operating system.

Process Communications :

Page Passing System : Features, Issues, Synchronization, buffering, failure handling Group Communication to many communication) different ordered delivery mechanism.

Remote Procedure Calls :

Model, implementation mechanism, Server Management, Parameter Passing, Communication Protocols, Client server binding.

Distributed Shared Memory :

General architecture issues, related to design & implementation of DSM, consistency models, Replacement strategy, Thrashing.

Synehronization :

Clock synchronization, even ordering mutual exclusion, deadlock, Election Algorithm.

Resource Management & Process Management :

Task assignment approach, Load balancing approach, Load sharing approach, Process migration, Threads, Concepts in distributed systems.

Text Books :

1. Distributed Operating Systems : Concepts & Design
   Pradeep K.Sinha, Eastern Economy Edition
   Selected Chapters: 1,3 to 8

Reference Books :

1. OS Concepts : Silverscatez & Galvir
2. Modern Operating System : By Tanenbaum.

EIGHTH SEMESTER

EL II

(Electronics & Telecommunication Engg.)

ME 801 INDUSTRIAL MANAGEMENT

FM 80

1. **Management and its functions :** Concept of Management : types of Management, Principal functions and levels of Management.
2. **Industrial Organizations :** Nature and Purpose of Organization, Principle of Organization Responsibility, Authority, span of Control, communications, Coordination etc. Organization Strictures (Line, functional and Line & Staff)
3. **Strategic Planning Forecasting and Decision Making :** Nature and purpose of strategies and policies strategie planning process, Effective implementation of strategies and policies strategie planning process, Effective implementation of strategies.

   Definition of Forecasting, qualitative and Quantitative methods of forecasting Importance and Limitations of Rational Decision Making, Evaluation of Alternatives, Selecting an Alternative, Decision Making Process, Decision making under Certainty, Uncertainty and Risk.
4. **Materials Management :** Its importance and function, purchasing & distribution. Inventory concepts (Inventory categories, types of demand, measures of inventory, coasts, types of inventory) Economy order quantity (Total inventory costs, calculation of EOQ. Sensitivity analysis, Limitations)

   Continuities Review system (Selection of Recorder point)

   Periodic Review system (Selection of Recorder Interval)

   Practical Issue (ABC Analysis)

   Elementary Ideas of Materials Requirements Planning (MRP)
5. **Marketing Management :** Definition, Selling Concept vs. Marketing Concept, Marketing Principles and Functions.
6. **Financial Management and Engineering Economics :** Concept, Objectives, Types of Capital, Sources, of Finance, Accounting, Assets and Liabilities, Profit and Loss Account, Balance Sheet.

   Cost Accounting, Elements of Cost, Overheads, Factory cost, Total cost, selling price, break even Analysis.

   Time value of money, Future value of an investment, present value of a future

amount, present value factors Annuities.

7. **Personnel Management :** Definition and concept, functions, Human resource planning, selection Training Loading and development of manpower, Labour welfare.

8. **Industrial Maintenance :** Objectives preventives and Breakdown maintenance, Optimum Maintenance Rate, definition of Maintainability, Simple Replacement Analysis.

Text Books :

1. Industrial Engineering and Management O.P. Khanna.
2. Industrial Engineering and Management K.M. Ahuja.

Reference Books :

1. Operation Management L.J. Krajewski and L.P.Ritzman.
2. Production and operations Management - Norman Gaither.
3. Modern production / Operations Management By E.S.Buffa
4. Industrial Organisation & Engineering Economics - T.R. Banga & S.C.Sharma

EIGHTH SEMESTER

(Electronics & Telecommunication Engg.)

HU 803 INDUSTRIAL PSYCHOLOGY AND BEHAVIOURAL SCIENCE

FM 80

Expanding scope of Scientific psychology, General and Applied.

Basic Processes : Perception, Characteristics of perception and Organization Phenomena.

Leaming : Definition, Learning cure, Principle of Leaning and Industrial training.

Personality : Definition, Development, approaches.

Communication : Need, Types.

Group Dynamics : Interpersonal relations and development of Interpersonal skills, Group.

Selection and placement :

Personal selection, job analysis, Interviews, psychology test, Decision Making.

Motivation : Needs Motivators, hierachy of needs Motivations Theories

Leadership Theories, Development of leadership skills.

Physical Environment of work : Hours of work, illumination, Temperature and Noise.

Reference Books : Industrial psychology : Tiffin and Mc Comick. Prentic Hall. 5th Edition

Text Book of Industrial Organization psychology : Girishobala Mohanty, Oxford & IBH.

General psychology : Hilgard, Attkinson and Alkinson, (Oxford & IBH).

Industrial psychology : Dr. Ramnath Sharma, Rajhans publishers.

Introduction of psychology : N.Munn, L.Dodge, Fernald, Jr. P.S. Fernald (Oxford & IBH)

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