B. N. Mandal University, Laloonagar, Madhepura

Details of theory & Sessional Papers code of 2nd Year B. Tech. Course

Branch: Electronics & Communication Engineering

Subject	Subject Code	Branch Code	L	T	P	Th. Ext.	Th. Int.	Sessional
Mathematics-III	MA-III	EC-201	3	1	0	70	30	--------
Numerical Methods & Computational Techniques	NMCT	EC-202	2	1	3	70	30	Numerical Methods & Computational Techniques-50
Basic Electronics	BE	EC-203	2	1	3	70	30	Basic Electronics-100
Electrical Machine-I	EM/c-I	EC-204	2	1	3	70	30	Electrical Machine-I-50
Digital Electronics	DE	EC-205	2	1	3	70	30	Digital Electronics-100
Object Oriented Programming	OOP	EC-206	2	1	3	70	30	Object Oriented Programming-100
Organizational Behaviour & Industrial Psychology	OBIP	EC-207	3	1	0	70	30	--------
Solid State Physics & Device	SSPD	EC-208	3	1	0	70	30	--------

Expert II
(Internal)
Name: Prof. Vipin Kr. Singh
Designation: HOD, ECE
Address: MIT, Purnea

Faculty of Science & Engineering
BNMU, Madhepura

Principal
MIT, Purnea

Member Secretary
Syllabus Committee
BNMU, Madhepura

rdinary differential equations & special functions: Series solution of differential equations robenius method, Bessel's equation, solution, Bessel's function of first and second kind, ecurrence formula, Legendre's equation, solution, Legendre polynomials, Rodrigue's rmula, orthogonality of Legendre polynomial

Lecture: 15

artial differential equation: Basic concept, 1st & 2nd order linear & quasi- linear partial fferential equation, classification of second order PDE, boundary and initial conditions, wave quations, separation of variables, use of Fourier series, D'Alembert's solution of wave equation eat equation, solution by Fourier series

Lecture: 15

omplex analysis-I: Function of complex variables- limit, continuity, differentiability and nalyticity of functions, Cauchy-Riemann equations, Laplace's equation, harmonic functions auchy's integral theorem, Cauchy's integral formula, Taylor's and Laurent series, residues and ts applications to evaluating real integrals.

Lecture: 15

Probability & Statistics: Theorems on probability, including Baye's rule, random variable- umulative distribution function, probability mass function, probability density function, mathematical expectation mean variance, moment, generating function and characteristics function, standard probability model binomials, Poisson exponential, Weibull, normal and gamma, sampling and sampling distribution, Chi-square and t-distributions, large and small samples, tests of significance

Lecture: 20

s:

Advanced engineering mathematics by R K Jain & S R K Iyengar

Higher engineering mathematics by B S Grewal.

Fundamentals of mathematical statistics by V K Kapoor, & S C Gupta, Sultan & sons.

Books:

Advanced engineering mathematics by E. Kreyszig 8th edition, John Wiley.

Complex variables and applications by Churchill & Brown, McGraw Hill.

Elements of partial differential equation by I N Sneddon, McGraw Hill

Introduction to probability & statistics for engineering by S M Ross, John Wiley.

17/1/13 17/1/13 Vivek 17/1/13 17/1/13 17/1/13 17/1/13 17/1/13

NUMERICAL METHOD & COMPUTATIONAL TECNIQUE (CSE/EE/ME/CE/ECE/IT)

L-T-P: 2-1-3

ANCH CODE EC-202

RST TERM

INTRODUCTION TO COMPUTER LANGUAGE:

achine language, assembly language, high level language, compilers, problem solving using mputer Algorithm, flowchart, examples

lecture-03

. C/C++ PROGRAMMING:

onstants & variables, arithmetic expression, I/O statement, specification statement, control tatement, subscripted variables, logical expression, function and subroutines, examples of rogramming should include numerical as well as non numeric applications, matrix operations, earching, sorting.

lecture-21

SECOND TERM

3. ITERATIVE TECHNIQUE FOR SOLUTION OF EQUATION:

I. SOLUTION OF NON LINEAR EQUATION-simple iteration scheme, bisection method, Regula-falsi method, Newton-Raphson method, secant method, their rates of convergence, order of errors etc.

lecture-12

II SOLUTION OF LINEAR EQUATION-Gaussian elimination, matrix inversion by Gaussian method, computation of determinants, Jacobi and Gauss - Seidal iteration method.

Lecture-06

I. POLYNOMIAL APPROXIMATION: interpolation, several form of interpolating polynomials like Lagrangian interpolation of polynomial and Newtons forwared and backward difference formula, curve-fitting(least square)

lecture-04

. NUMERICAL INTEGRATION: Trapezoidal method , Simpsons' rule($1/3^{rd}$ and $3/8^{th}$) order of errors in integration.

lecture-04

. SOLUTION OF INITIAL VALUE PROBLEMS: Euler's method, Runge – kutta second order and fourth order methods (without proof), solution of boundary value problem-finite difference method

Lecture-05

II method

UMERICAL METHODS FOR SCIENTIFIC FOR ENGINEERING COMPUTATIONS BY M.K JAIN,LYENGAR
R K JAIN, NEW AGE INTERNATIONAL PUBLISHERS, NEW DELHI

NTRODUCTORY METHOD OF NUMERICAL ANALYSIS BY S.S.SASTRY, PHI PVT LTD.

FERENCE BOOKS

NUMERICAL ANANLYSIS IN ENGINEERING BY RAMA B. BHAT, S.CHAKRAVARTY, NAORSA PUBLISHING
USE

ADVANCED ENGINEERING MATHEMATICS BY E.KREYSZIG, 8th EDITION BY JOHN WILLEY & SONS, NEW
RK.

T LAB

RKING IN WINDOWS ENVIROMENT,FORTRAN 77 PROGRAMMING BASED ON SYLLABUS

t: Basic Electronics Branch Code: EC-203 (ECE/CSE/EE/ME)

2-1-3

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PN junction diode: Semiconductor, Depletion layer, barrier potential, forward and reverse bias, breakdown voltage, PIV, characteristics of PN junction diode, knee voltage, ideal PN junction diode, junction capacitance, breakdown diode (zener diode). **Lecture: 10**

Rectifiers and filters: Half wave and full wave rectifiers (centre tapped and bridge), regulation, ripple factor, elementary theory of filter, L, C, L-C, and π filters. Clipping and clamping circuit, voltage multiplier. **Lecture: 9**

BJT introduction: Basic theory and operation of PNP and NPN transistors, characteristics of CB, CE and CC configurations and determination of α, β, γ and their relations. **Lecture: 5**

d Term

Biasing: Base bias, emitter feedback bias, voltage divider bias, load line, operating point. Incremental analysis using h-model. **Lecture: 8**

FET: Introduction, operation, JFET parameters, JFET characteristics, JFET amplifiers.

MOSFET: Introduction, operation, MOSFET parameters. **Lecture: 6**

Feedback amplifiers: Theory of feedback amplifier, positive and negative feedback, feedback topologies, feedback amplifiers. **Lecture: 4**

Integrated circuits: Characteristics of ideal op-amp. Application as inverting, non-inverting amplifiers, summer, difference, differentiator, integrator. **Lecture: 4**

Principle and applications of SCR and UJT. **Lecture: 2**

Books:

Electronic devices and circuits theory by Boylestad and Nashelsky, Pearson

Electronic principles by Albert Malvino and Davis J Bates, TMH.

Art of Electronics by Paul H Horowitz.

ence:

Introduction to electronic circuit design by Spencer, Pearson.

Device electronics for integrated circuits by Muller and Kamins with Masun Chan, Wiley eastern edition.

Principles of electronics by V K Mehta and Rohit Mehta, S Chand.

Electronic circuit and system by R J Smith, Wiley.

Electronics Lab:

Introduction to DMM (Digital multimeter)

Introduction to passive components (resistor, capacitor, and inductor)

Introduction to CRO- time period measurement, study of different wave forms, measurements of frequency of sinusoidal waveforms by Lissajou's figure.

Introduction to connectors- multi strand wires and single strand wires and bread boards.

Study of output characteristics of diode, BJT, FET, UJT, SCR.

Application of diodes, BJT, FET, UJT and SCR, clipping and clamping, rectification, RC coupled CE and CS FET amplifiers, relaxation oscillators.

Application of μA 741 inverting amplifiers, summer amplifiers, difference amplifiers, integrator and differentiator

Book:

Lab manual by Maheshwari, PHI

ct : Electrical Machine-I Branch Code :EC 204 (EC / EE)

-3-0-3

Term

1 DC Generator : Constructional Feature and types of D.C Machines, Types of armature winding, Actions of Commutator, Principle of operation of D.C Gen... EMF, Armature reaction, Commutation, Compensating Winding and Inter... and Internal Characteristics of D.C Generator, Critical Resistance, Critical speed.

Lecture 10.

2. D.C. Motor : Principle of D.C Motors, Back EMI, Torque and Speed characteristics of DC Motor Losses and efficiency. Lecture 6

3. Single Phase Transformer : Basic Principle, Types and Construction of Single Phase Transformer, EMF equation, Equivalent circuits, phasor diagram, ... Testing, Voltage Regulation, per unit system, Losses and Efficiency, parallel operation of Single Phase Transformer

Lecture 10

Second Term

4 Auto Transformer : Working Principle, Saving of conductor, ... -tage of Auto Transformer. Lecture ...

5. Three Phase Transformer : Introduction, Types, Phasor group, Parallel Operation of three phase Transformer, Cooling of Transformer Lecture 4

6 Three phase Induction Motor : Construction Types and Principle of Operation, Three phase induction Motors, Production of rotating magnetic field, slip, ... and Phasor Diagram Mechanical Power Developed Maximum torque, ... characteristics Losses and efficiency Starting Testing and speed control of 3-phase induction Motor. Lecture 12

Text Book :

1 Electrical Machine by Samarjit Ghosh, Pearson Education Pvt. Ltd.
2 Electrical Machine by P.S bimbara, Khanna Publication
3 Electrical Machine by Nagrath, I J and Kothari D.P F.M.H

Reference Book :

1 Electrical Machinery by Fitzgerald A.K. \$Kingsley TMH
2 Direct Current Machine by E.W Dawsing

Electrical Machine I Lab

Practical Based on Syllabus

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Digital Electronics Branch Code: EC-205 (ECE/CSE/EE)

-3

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gital principle. Analog vs Digital, number system, computer codes, digital signals, waveforms, sitive and negative logic, Logic Gate: basic, universal and others, truth table, logic function, IC ps, timing diagram, electrical analogy. **Lecture: 5**

oolean laws and theorems: Logic functions, conversion of logic functions into truth table and vice ersa. SOP and POS forms of representation, min terms and max terms, simplification of logic nctions by theorems and Karnaugh's map, don't care conditions, design of special purpose mputers and related practical problems. **Lecture: 6**

Analysis and synthesis of combinational logic circuits: Adder and Subtractors, multiplexers, de multiplexers, encoders, decoders, code converters, magnitude comparators, parity generators and checkers. **Lecture: 6**

Integrated circuit logic families: RTL, DTL, TTL, CMOS, IIL, ECL. **Lecture: 5**

Term

Sequential circuit blocks and latches: flip-flops- rat-race condition, master slave and edge triggered, SR, JK, D & T flip flops, shift registers, counters- synchronous and asynchronous: design of ripple counter. **Lecture: 10**

Timing circuits: Multivibrators: monostable and astable, timer: LM555. **Lecture: 4**

Use of building blocks in designing larger systems such as digital to analog converter (DAC), weighted resistor and r-2r, analog to digital converter (ADC) comparator, counter and succession. **Lecture: 5**

Memories: Static and dynamic RAMs, ROM, EPROM, EEPROM. **Lecture: 3**

ooks:

Digital systems principles and applications by Tocci, Widmar and Jain, Pearson.
Digital fundamentals by Floyd and Jain, Pearson.

nce books:

Fundamentals of VHDL design by Stephen Brown and Zovenkeo Vraseseic, TMH.
Introduction to logic design with cd ROM by Alan B Marcovity, TMH.
Fundamentals of digital logic with Verilog design by Stephen Brown TMH.
Modern digital electronics by R P Jain TMH.

Electronics Lab:

Realization of logic gates including the universal gates.
Realization of the Boolean algebra.
Realization of the different logic circuits.

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OBJECT ORIENTED PROGRAMMING (CSE/EE/ECE/CE/IT)

CH CODE-TC-206

L-T-P:2-1-3

1 TERM

ODUCTION TO C++:

t oriented technology, advantages of OOP, input-output in C++,tokens, keywords, identifiers, data
C++, derives data types, the void data types, type modifiers, typecasting, constant, operator,
edence of operators, strings

ONTROL STRUCTURES lecture-02

sion making statements like if-else, nested if-else, goto , break, continue, switch case, loop
ment like for loop, nested for loop, while loop, do-while loop

UNCTIONS: lecture-12

s of function, user-defined functions, value-returning functions, void functions, value parameters,
ction overloading, virtual functions

LASSES AND DATA ABSTRACTION: lecture-06

ucture in C++,class, build-in operations on classes, assignment operators and classes,classes scope,
erence parameters and class objects, member functions. Accessor and Mutator functions,
structors, default constructor, destructors

OND TERM lecture-08

VERLOADING & TEMPLATES:

ator overloading, function overloading, function templates, class templates. lecture-06

NHERITANCE:

le and multiple inheritance, virtual base class, abstract class, pointer and inheritance , overloading
ber function,

OINTERS NAD ARRAYS lecture-06

l pointers , pointer to class ,pointer to object ,the this pointer , void pointer, Arrays

lecture-06

CEPTION HANDLING:

keywords try, throw and catch, creating own exception classes, exception handling techniques
minates the program, fix the error and continue, log the error and continue), stack unwinding

lecture-12

BOOKS:

PROGRAMMING IN C++, VOLUME 1 & 2 BRUCE ECKEL, CHUCK ALLISON,

PROGRAMMING IN C++

ERENCE BOOKS:

THE C++ PROGRAMMING LANGUAGE 3/E BY STROUSTRUP PERASON

BY CAY HORSTMANN, WILEY INDIA

ORIENTED PROGRAMMING LAB (OOP)

PROGRAMS USING CLASSES AND OBJECTS, CONSTRUCTORS AND DESTRUCTORS, INHERITANCE

OVERLOADING OPERATORS, USE OF POINTERS LIST REPRESENTATION, PROGRAMS AND

FILE HANDLING, I/O MANIPULATORS USING C++.

EXCEPTION HANDLING:

Keywords try,throw and catch, creating own exception classes, exception handling techniques(terminates the program,fix the error and continue,log the error and continue), stack unwinding.

TEXT BOOKS:

THINKING IN C++, VOLUME 1 & 2 BRUCE ECKEL, CHUCK ALLISON,

MASTERING IN C++

REFERENCE BOOKS:

THE C++ PROGRAMMING LANGUAGE 3/E BY STROUSTRUP PERASON

Big C++ By CAY HORSTMANN,WILEY INDIA

PROGRAMMING LAB(OOP)

WRITINF PROGRAMS USING CLASSES AND OBJECTS, CONSTRUCTORS AND DESTRUCTORS, INHERITANCE PROPERTIES, OVERLOADING OPERATORS, USE OF POINTERS LIST REPRESENTATION, PROGRAMS AND VIRTUAL FUNCTIONS,FILE HANDLING, I/O MANIPULATORS USING C++.

Organizational Behaviour & Industrial Psychology
Branch Code: EC-207 (EC E/C E)

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Concept of organization & organizational behavior. **Lecture: 2**
Personality: Meaning, concept, determinants, personality theories (psychoanalytic theory, Trait theory and self theory). **Perception meaning:** concept, process of perception, significance of perception. **Learning:** meaning, concept, nature, component of leaning process. **Attitude:** meaning, concept, factors in attitude formation, method of finding employee's attitude. **Value:** meaning and types, value and attitude- similarity and difference. **Motivation:** meaning, theory of motivation (Maslow's theory & Herzberg's theory) **Lecture: 16**
Group & group dynamics: concept, importance, classification of groups, reason for group, formation, group cohesiveness. **Team work:** meaning, concept, types, creating, an effective team. **Lecture: 6**

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Communication: Concept, process, importance, barrier. **Organizational conflict:** meaning, concept, types, stages of conflict, resolution of conflict. **Power and politics:** nature and concept, ethics of power and politics, types of power. **Leadership:** concept, qualities and functions of a leader, approaches to the analysis of leadership. **Lecture: 9**
Concept of organizational theory: Concept of organization structure, form of organizational structure, form of organizational culture. **Lecture: 7**
Organizational effectiveness: Concept, approaches, criteria of effectiveness. **Organizational change:** meaning, factors in organizational change, process of planned change. **Organizational development:** concept, need of organizational development, difference between organizational development and management development. **Lecture: 8**

s:

Organizational behavior by Stephen P Robbin and Seema Sanghi, Pearson.
Organizational behavior by L M Prasad, S Chand.

books:

Organizational behavior meaning people and organization by Gregory Moorehead, Biztantra.

: Solid State Physics & Devices Branch Code: LC -208 (ECL)

: L T P

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istory of development of electronic devices Lecture: 3

: view of device physics: Photo-ionic emission, thermionic emission, gas discharge tubes, vacuum ubes, diodes, triodes, tetrodes and pentodes. Lecture: 3

rystal growth: Bulk and epitaxial. Lecture: 2

IC Technology: Oxidation, diffusion, ion implantation, lithography, thin film deposition(CVD, sputtering, evaporation) process integration, process flow for PN diodes, BJT and MOSFETs fabrication. Lecture: 5

Physics & technology of classical diodes:

Semiconductor carrier modeling- bonding model, energy band model, carriers, band gap, carrier properties (effective mass, intrinsic carrier concentration, doping), density of states, Fermi function, equilibrium carrier concentration (formula for n and p and np product). Charge neutrality relationship, determination of Fermi level, carrier conc. Temp. dependence.

Carrier action drift mobility, drift current, resistivity, diffusion current, total current, relation b/w the diffusion constants and movility (Einstein's relationship) recombination generation (band to band, RG Centre, auger,impact ionization). Equation of state continuity equation, minority carrier diffusion equation.

PN junction diode step junction, built in potential, depletion width, depletion approximation. Electrostatic relationship (charge density depletion with potential, electric field) for Va=0 and ≠ 0). Ideal diode equation (qualitative and quantitative derivation bond model, assumptions, approximation, boundary condition), deviation from ideal (RG current, series resistance, high level injection) Junction breakdown (avalanche and zener), reverse bias junction capacitance, forward bias diffusion capacitance. Lecture: 10

d Term

Zener diode, backward diode, tunnel diode, varactor diode, schottky diode. Lectuer: 3

Physics and technologies of BJT: Operational considerations, modes and configurations, performance parameters (emitter efficiency, base transport factor, common base current gain, CE current gain and their derivation for an ideal transistor, deviation from ideal) (base width modulation punch through, avalanche breakdown, geometrical effects, RG current), small signal modeling, qualitative understanding of switch response. Lecture:5

Physics and technologies of FET: Junction FET (theory of application, I-V relationship), MOS capacitor (energy band diagram, gate voltage relationship, capacitance voltage relationship), MOSFET (theory of operation, threshold voltage, I-V characteristics). Non ideal MOS (M-S work function difference, oxide charges, threshold adjustment and considerations) Lecture: 5

Physics and technologies of UJT and SCR: Silicon controlled rectifier (theory of operation, switching consideration), unijunction transistor (theory of operation). Lecture: 2

Photonics: Photo diodes (pin and avalanche), solar cell, LED, solid state LASER. Lecture: 3

CCD & CID Cameras. Lecture: 1

book :

- Electronic devices by Streetman and Banerjee, Pearson.
- Basic principles of semiconductor physics and devices by Neamen, TMH.
- Semiconductor devices by Kano, Pearson.

rences :

- Electronic material and devices by Kasp, TMH.
- Theory of semiconductor devices by Karl Hess, PHI.
- Semiconductor devices by Jasprit Singh, Wiley.
- Device electronics for integrated circuits by Muller & Kamps, Wiley.

17/11/13 Niveh 17/11/13