RKDF UNIVERSITY, BHOPAL
New Scheme of Examination as per AICTE Flexible Curricula
W.E.F. JULY 2019
Subject wise distribution of marks

B.E. IV Semester (Mechanical Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz		
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	
1	ME-4011	BSC-5	Engineering Mathematics-III	70	25	20	10	10	5	-	-	-	-	-	-	100
2	ME-4021	PCC-5	Kinematics and Theory of Machines	70	25	20	10	10	5	30	15	10	5	10	5	150
3	ME-4031	PCC-6	Power Plant Engineering	70	25	20	10	10	5	30	15	10	5	10	5	150
4	ME-4041	PCC-7	Material Science and Metallurgy	70	25	20	10	10	5	30	15	10	5	10	5	150
5	ME-4051	PCC-8	Machine Drawing	70	25	20	10	10	5	30	15	10	5	10	5	150
6	ME-4061	PCC-9	Java Programming	-	-	-	-	-	-	30	15	10	5	10	5	50
7	BE-4071	DLC-3	Internship-II (90 Hrs Duration) at the Institute Level	To be completed during IV semester. Its evaluation/ credit will be added in V semester												
			Total	**350**	**-**	**100**	**-**	**50**	**-**	**150**	**-**	**50**	**-**	**50**	**-**	**750**

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Mechanical Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
B.E. ME	Engineering Mathematics-III	M.E.- 4011

Unit I

Fourier series: Introduction of Fourier series, Fourier series for Discontinuous functions, and Fourier series for even and odd function. Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations.

Unit II

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit III

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi, Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equations by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods.

Unit IV

Solution of Ordinary Differential Equations (Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability: Probability: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Testing of Hypothesis |: Students t-test, Fisher's z-test, Chi-Square Method.

References
(i)   Higher Engineering Mathematics by BS Grewal, Khanna Publication
(ii)   Advance Engineering Mathematics by D.G.Guffy
(iii)   Mathematics for Engineers by S.Arumungam, SCITECH Publuication
(iv)   Engineering Mathematics by S S Sastri. P.H.I.
(v)   Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
(vi)   Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
(vii)   Pobability and Statistics by Ravichandran, Wiley India
(viii) Mathematical Statistics by George R., Springer

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (MECHANICAL ENGINEERING)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
ME	KINEMATICS AND THEORY OF MACHINES	ME - 4021

UNIT - I

Introduction Links-types, Kinematics pairs-classification, Constraints-types, Degrees of freedom of planar mechanism, Grubler's equation, linkage mechanisms, inversions of four bar chain, slider crank chain and double slider crank chain Velocity in Mechanisms Velocity of point in mechanism, relative velocity method, Velocities in four bar mechanism, slider crank mechanism and quick return motion mechanism, Rubbing velocity at a pin joint, Instantaneous center method, Types & location of instantaneous centers, Kennedy's theorem, Velocities in four bar mechanism & slider crank mechanism

UNIT - II

Acceleration in Mechanisms Acceleration of a point on a link, Acceleration diagram, Coriolis component of acceleration, Crank and slotted lever mechanism, Klein's construction for Slider Crank crank mechanism Mechanisms with Lower Pairs Pantograph, Exact straight line motion mechanisms-Peaucellier's, Hart and Scott Russell mechanisms, Approximate straight line motion mechanisms–Grass-Hopper, Watt and Tchebicheff mechanisms, Analysis of Hooke's joint, Davis and Ackermann steering gear mechanisms.

UNIT - III

FRICTION Laws of friction, Friction on inclined plane, Efficiency on inclined plane, Friction in journal bearing-friction circle, Pivots and collar frictionuniform pressure and uniform wear, Belt and pulley drive, Length of open and cross belt drive, Ratio of driving tensions for flat belt drive, centrifugal tension, condition for maximum power transmission, V belt drive Brakes & Dynamometers Shoe brake, Band brake, Band and Block brake, Absorption and transmission type dynamometers

UNIT - IV

CAMS Cams and Followers – Classification & terminology, Cam profile by graphical methods with knife edge and radial roller follower for uniform velocity, simple harmonic and parabolic motion of followers, Analytical methods of cam design – tangent cam with roller follower and circular cams with flat faced follower

UNIT - V

Gears & Gear Trains Classification & terminology, law of gearing, tooth forms &comparisons, Systems of gear teeth, Length of path of contact, contact ratio, interference & under cutting in involute gear teeth, minimum number of teeth on gear and pinion to avoid interference, simple, compound, reverted and planetary gear trains, Sun and planet gear.

Books and References:
1.   Theory of Machines – Thomas Bevan
2.   Theory of Machines and Mechanisms- Shigley
3.   Theory of Machines and Mechanisms-Ghosh & Mallik
4.   Theory of Machines and Mechanisms- Rao & Dukkipati
5.   Theory of Machines-S.S. Rattan
6.   Kinematics of Machines-Dr. Sadhu singh
7.   Mechanics of Machines – V. Ramamurti
8.   Theory of Machines – Khurmi & Gupta
9.   Theory of Machines – R. K. Bansal
10.   Theory of Machines – V. P. Singh
11.   Theory of Machines – Malhotra & Gupta

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (MECHANICAL ENGINEERING)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
ME	**POWER PLANT ENGG**	**ME - 4031**

Unit - I

Introduction Power and energy, sources of energy, review of thermodynamic cycles related to power plants, fuels and combustion calculations. Load estimation, load curves, various terms and factors involved in power plant calculations. Effect of variable load on power plant operation, Selection of power plant
Power plant economics and selection Effect of plant type on costs, rates, fixed elements, energy elements, customer elements and investor's profit; depreciation and replacement, theory of rates. Economics of plant selection, other considerations in plant selection.

Unit - II

Steam power plant General layout of steam power plant, Power plant boilers including critical and super critical boilers. Fluidized bed boilers, boilers mountings and accessories, Different systems such as coal handling system, pulverizers and coal burners, combustion system, draft, ash handling system, Dust collection system, Feed water treatment and condenser and cooling towers and cooling ponds, Turbine auxiliary systems such as governing, feed heating, reheating , flange heating and gland leakage. Operation and maintenance of steam power plant, heat balance and efficiency, Site selection of a steam power plant.

Unit - III

Diesel power plant General layout, Components of Diesel power plant, Performance of diesel power plant, fuel system, lubrication system, air intake and admission system, supercharging system, exhaust system, diesel plant operation and efficiency, heat balance, Site selection of diesel power plant, Comparative study of diesel power plant with steam power plant.
Gas turbine power plant Layout of gas turbine power plant, Elements of gas turbine power plants, Gas turbine fuels, cogeneration, auxiliary systems such as fuel, controls and lubrication, operation and maintenance, Combined cycle power plants, Site selection of gas turbine power plant

Unit - IV

Nuclear power plant Principles of nuclear energy, Lay out of nuclear power plant, Basic components of nuclear reactions, nuclear power station, Nuclear waste disposal, Site selection of nuclear power plants. Hydro electric station Hydrology, Principles of working, applications, site selection, classification and arrangements, hydro-electric plants, run off size of plant and choice of units, operation and maintenance, hydro systems, interconnected systems. Non Conventional Power Plants Introduction to non-conventional power plants (Solar, wind, geothermal, tidal) etc.

Unit - V

Electrical system Generators and generator cooling, transformers and their cooling, bus bar, etc. Instrumentation Purpose, classification, selection and application, recorders and their use, listing of various control rooms. Pollution due to power generation

References
1. "Power Plant Engineering" F.T. Morse, Affiliated East-West Press Pvt. Ltd, New Delhi/Madras.
2. Power Plant Engineering" Mahesh Verma, Metropolitan Book Company Pvt. Ltd. New Delhi
3. "Power Plant Technology" El-Vakil, McGraw Hill.
4. Power Plant Engineering by P.K. Nag, Tata McGraw Hill.
5. Steam & Gas Turbines & Power Plant Engineering by R.Yadav, Central Pub.House.

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (MECHANICAL ENGINEERING)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
ME	**MATERIAL SCIENCE & METTALURGY**	**ME - 4041**

Unit - I

Engineering Materials: Classification of plain carbon steels; composition, properties & applications of low, medium & high carbon steels. Alloy steels: Free cutting steels; structural steel, spring steel, tool steel, high speed steels stainless steels. Effects of alloy element on properties of steels. Type of Cast irons: composition, properties & applications of each. Properties of aluminium; alloy of aluminium , (wrought & cast alloys), properties of copper, copper alloys (Brasses & Bronzes); Introduction and application to nano materials. Powder metallurgy- property and application.

Unit - II

Plastic Deformation of Metals: The tensile stress strain curve, Deformation by slip & by twinning, Dislocation theory, Theory of work hardening its effect on properties of metals, Recovery, Recrystallisation and grain growth; Hot and cold working of metals and their effect on mechanical properties, annealing, Introduction to creep, fracture and fatigue behavior of metals.

Unit - III

Crystal Structure: Mechanism of crystallization; unit cells, space lattice and lattice constants; Crystal systems, and Bravias Lattices; Body centered cubic, Face centered cubic and Hexagonal closed packed structure; Miller indices for planes and directions; Crystal imperfections; point defects, line defects and surface defects. Manufacturing and properties of refractory (acid, basic and natural).

Unit - IV

Heat Treatment of Steels: Definition, principle, and purpose of heat treatment. Description of heat treatment methods: Hardening, Annealing, Normalizing, Tempering and case hardening with microstructure changes. Mar-temping & Austempering, Hardenability and its determination. Precipitation Hardening. Isothermal Transformation of steel, Transformation on continuous cooling, Critical cooling rate, Heat treatment furnace.

UNIT - V

Phase Diagrams: Definition of phase, Equilibrium cooling of pure metals and binary alloys. Hume Rothery rule for solid solubility, Types of solid solution, Eutectic, Euteitoid and Peritectic reactions, Allotropy of iron, Iron-Iron carbon equilibrium diagram, relationship equilibrium diagram and properties of alloy.

List of Reference Books:
1.   Introduction to physical Metallurgy by Sidney H. Avnen,.- Tata McGraw-Hill
2.   Material Science & Metallurgy for Engineering by Dr.V.D. Kodgire.- Everest Pub. House, Pune.
3.   Materials Science & Engineering by V. Raghavan.- Prentice Hall of India, New Delhi.
4.   Heat Treatment principles & Technology by T.V. Rajan, O.P. sharma.-

5. Engineering Metallurgy Part –I by Raymond A. Higgins, ELBS.
6. Introduction to Engineering materials by B.K. Agrawal.-
7. Physical Metallurgy for Engineering by Donald S. Clark & Willbur R. Varney, EWP.
8. Engineering Material and Metallurgy by R.K. Rajput / S Chand
9. Material Science & Metallurgy for Engineering by O.P. Khanna, Dhanpat Rai

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (MECHANICAL ENGINEERING)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
ME	**MACHINE DRAWING**	**ME - 4051**

Unit – I

Introduction: Principles of Drawing, Requirements of production drawing,Sectioning and conventional representation, Dimensioning, symbols of standard tolerances, Machining Symbols such as external and internal threads, slotted heads, square ends, and flat radial ribs, slotted shaft, splined shafts, bearings, springs, gears. Introduction to Compute Aided Drafting software for 2D and 3D Modeling.

Unit – II

Fasteners: Various types of screw threads, types of nuts and bolts, screwed fasteners, welding joints and riveted joints.

Unit - III

Assembly Machine Drawing: Basic concept, plotting technique, assembly and blow up of parts, bill of materials, product data; Cotter and Knuckle joints, pedestal and footstep bearings, crosshead, stuffing box, IC engines parts - piston and connecting rods; lath machine parts.

Unit - IV

Pipe and Pipe Fittings: flanged joints, spigot an socket joint, union joint, hydraulic an expansion joint. Couplings: Solid or Rigid Coupling, Protected Type Flange coupling, muff coupling, Oldham, universal coupling, cone friction clutch, free hand sketch of single plate friction clutch.

Suggested Readings / Books:
1.   Ajit Singh, Machine Drawing (including Auto CAD), Tata McGraw Hill
2.   N.D. Bhatt, Machine Drawing, Charotar publications
3.   N. Sidheshwar, Machine Drawing, Tata McGraw Hill.
4.   P.S. Gill, Machine Drawing, BD Kataria and Sons.
5.   V Lakshmi Narayanan and Mathur, Text -book of Machine Drawing
6.   Narayana and Reddy; Machine Drawing; New age, Delhi.
7.   Dr. kk dewadi, Machine Drawing, Dhanpat Rai

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (MECHANICAL ENGINEERING)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
ME	**Java Programming**	**ME- 4061**

UNIT-I

Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes

UNIT–II

Java Collective Frame Work - Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector.Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queue and Interface Queue, Maps, Properties Class, Un-modifiable Collections.

UNIT–III

Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

UNIT–IV

Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, Multitier Applications, Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT–V

Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:
1. Deitel & Deitel, ”JAVA, How to Program”; PHI, Pearson.
2. E. Balaguruswamy, “Programming In Java”; TMH Publications
3. The Complete Reference: Herbert Schildt, TMH

List of Program to be perform (Expandable)
1.   Installation of J2SDK
2.   Write a program to show Concept of CLASS in JAVA
3.   Write a program to show Type Casting in JAVA
4.   Write a program to show How Exception Handling is in JAVA
5.   Write a Program to show Inheritance
6.   Write a program to show Polymorphism

RKDF UNIVERSITY, BHOPAL
New Scheme of Examination as per AICTE Flexible Curricula
W.E.F. JULY 2019
Subject wise distribution of marks

B.E. IV Semester (Civil Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz		
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	
1	CE-4011	ESC-7	Environmental Engineering	70	25	20	10	10	5	-	-	-	-	-	-	100
2	CE-4021	PCC-5	Concrete Technology	70	25	20	10	10	5	30	15	10	5	10	5	150
3	CE-4031	PCC-6	Surveying and Geomatics	70	25	20	10	10	5	30	15	10	5	10	5	150
4	CE-4041	PCC-7	Engineering Material and Construction Techniques	70	25	20	10	10	5	30	15	10	5	10	5	150
5	CE-4051	PCC-8	Fluid Mechanics	70	25	20	10	10	5	30	15	10	5	10	5	150
6	CE-4061	PCC-9	Software Lab	-	-	-	-	-	-	30	15	10	5	10	5	50
7	BE-4071	DLC-3	Internship-II (90 Hrs Duration) at the Institute Level	To be completed during IV semester. Its evaluation/ credit will be added in V semester												
			Total	350	-	100	-	50	-	150	-	50	-	50	-	750

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Civil Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
B.E. CE	Environmental Engineering	C.E.- 4011

Unit-I

Ecosystem – Principles of ecology, ecosystem concept: Biotic and biotic components of ecosystem, Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Biodiversity: Threats and conservation, Food Chain.

Unit –II

Energy General idea about: Natural Resources , current status and types of resources Non Renewable Sources of energy, coal, oil, Gas, Hydrogen, nuclear sources

Unit –III

Air Pollution & Sound Pollution - Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution Environmental problems, (Global warming, ozone depletion and acid rain) General idea about forest ecosystem, grassland ecosystem, wetland ecosystems and aquatic Biogeochemical Cycling: Oxygen cycle, Carbon cycle, Nitrogen cycle, Sculpture cycle and water cycle.

Unit –IV

Water Pollution– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

Soil Pollution – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

Unit –V

Society & Ethics – Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, water preservation rain water collection. Environmental Impact Assessment.

References:
1.   Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics"; Cengage Pub.
2.   Rana SVS ; "Essentials of Ecology and Environment"; PHI Pub.
3.   Raynold, GW "Ethics in information Technology"; Cengage.
4.   Svakumar; Energy Environment & Ethics in society; TMH
5.   AK De "Environmental Chemistry"; New Age Int. Publ.
6.   BK Sharma, "Environmental Chemistry" ; Goel Publ. House

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (CIVIL ENGINEERING)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
CE	**Concrete Technology**	**CE- 4021**

Unit I

Introduction Classification, properties, grades, advantage & disadvantages of concrete, Ingredients of concrete, types of cement, aggregates, water, admixtures, Inspection & testing of
materials as per Indian Standard Specifications.

Unit II

Properties of Fresh and Hardened Concrete : Introduction, Workability, Testing of concrete, Factors affecting, Rheology of concrete, Compressive & Tensile strength, Stress and strain characteristics, Shrinkage and temperature effects. Creep of concrete, Permeability, durability, thermal properties & micro-cracking of concrete.

Unit III

Design of Concrete Mix : Various classical methods of concrete mix design, I.S. code method, basic considerations and factors influencing the choice of mix design, acceptance criteria for concrete, concrete mixes with Surkhi and other Pozzolanic materials, design of plastic concrete mix, computer aided design of concrete mix.

Unit IV

Production and Quality Control of Concrete: Production of crushed stone aggregate, batching equipments for production and concreting, curing at different temperatures, Concreting underwater, hot & cold weather condition, statistical quality control, field control, non-instructive testing, repair technology for concrete structures, Inspection & Testing of Concrete.

Unit V

Special Concretes : Light weight concrete, Ready mix concrete, Vacuum concrete, Ferrocement, Fiber reinforced concrete, Polymer concrete composites, Shotcrete, Guniting, Rubble concrete, Resin concrete, Prestressed concrete, Heat resistant concrete, Mass concrete, Temperature control of mass concrete.

References:
1. Varshney RS; Concrete Technology; Oxford & IBH publishing co.
2. Gambhir ML; Concrete Technology – TMH
3. Sinha SN; Reinforced Concrete Technology; TMH
4. New Building Materials Published by B.M.T.P.C., New Delhi
5. Hand books on Materials & Technology - Published by BMTPC & HUDCO
6. Mohan Rai & M.P. Jai Singh; Advances in Building Materials & Construction
7. Jackson N; Civil Engineering materials.
8. Properties of Concrete - A.M. Neville - Pearson Education

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (CIVIL ENGINEERING)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
CE	**Surveying and Geomatics**	**CE- 4031**

Unit-I
Traversing by theodolite, Field work checks, traverse computations, latitude and departures, adjustments, computations of co-ordinates, plotting & adjusting or traverse, Omitted measurements, Measurement EDM, Trigonometrical leveling.
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Unit-II
Tachometry: Tachometric systems and principles, stadia system, uses of anallatic lens, tangential system, sublense system, instrument constant, field work reduction, direct-reading tacheometers, use of tacheometry for traversing and contouring.

Unit-III
Curves: Classification and use; elements of circular curves, calculations, setting out curves by offsets and by theodolites, compound curves, reverse curves, transition curves, cubic spiral and lemniscate, vertical curves, setting out.

Unit-IV
Control Surveys: Providing frame work of control points, triangulation principle, co naissance, selection and marking of stations, angle measurements and corrections, baseline measurement and corrections, computation of sides, precise traversing.

Unit-V
Hydrographic Surveying: Soundings, methods of observations, computations and plotting. Principles of photographic surveying: aerial photography, tilt and height distortions,Remote sensing, simple equipments, elements of image interpretation, image-processing systems.

Reference
1.   T.P. Kanetkar, Surveying & Levelling, Vol. I & II.
2.   Duggal; Surveying vol I and II; TMH
3.   Basak; Surveying and Leveling; TMH
4.   R.E.Devis, Surveying theory & Practice, Mc.Graw Hill, New York
5.   David Clark & J Clendinning, Plane & Geodetic surveying Vol. I & II, constable & Co. London.
6.   S.K. Roy, Fundamentals of surveying, prentice - Hall of India New Delhi
7.   B.C. Punmia, Surveying Vol. I, II, III, Laxmi Publications New Delhi
8.   K.R. Arora, Surveyhing Vol. I & II, standard book House, New Delhi

List of Experiments/ Field work (Expandable):

1. Theodolite traversing
2. Profile leveling, contouring & cross sectioning
3. Determination of tachometric constants & uses of tachometer in various field works
4. Curve setting by different methods.

Branch	Subject Title	Subject Code
CE	**Engineering Materials & Construction Techniques**	**CE- 4041**

A)   Construction Materials:

UNIT-I

Stones : Occurrence, varieties, Characteristics and their testing, uses, quarring and dressing of stones. Timber : Important timbers, their engineering properties and uses, defects in timber, seasoning and treatment, need for wood substitutes, Alternate materials for shuttering doors/windows, Partitions and structural members etc. Brick and Tiles: Manufacturing, characteristics, Classification and uses, Improved brick from inferior soils, Hand molding brick
table, Clay-fly ash brick table, Flooring tiles and other tiles and their characteristics.

UNIT-II

Advance Construction Materials : Use of fly ash in mortars, concrete, Fly ash bricks, stabilized mud blocks, non-erodible mud plinth, D.P.C. materials, Building materials made by Industrial & agricultural waste, clay products P.V.C. materials, advance materials for flooring,doors & windows, facia material, interiors materials for plumbing, sanitation & electrification.

(B) Construction Techniques:

UNIT-III

Foundation: Type of soils, bearing capacity, soil slablisation and improvement of bearing capacity, settlement and safe limits. Spread foundations, wall footings, grillage,foundations well foundation, causes of failure and remedial measures; under reamed piles,foundation on shrinkable soils, black cotton soil, timbering for trenches, dewatering offoundations. Hyperbolic parabolied footing, Brick arch foundation. Simple methods of foundationdesign, Damp proof courses, Repairs Techniques for foundations

UNIT-IV

Masonry and Walls : Brick masonry, Bonds, Jointing, Stone masonry, casting and laying, masonry construction, Brick cavity walls, code provisions regarding load bearing and non load bearing walls. Common defects in construction and their effect on strength and performance of walls, designed Brick masonry, precast stone masonry block, Hollow concrete block, plastering and pointing, white and color washing, distempering, dampness and its protection, Design of hollow block masonry walls. Doors, Windows and Ventilators: Types based on material etc., size location, fittings, construction sunshades, sills and jambs, RCC doors/windows frames. Stairs types, rule of proportionality etc., Repairs techniques for masonry, walls, doors & windows.

UNIT-V

Floors and Roofs : Types, minimum thickness, construction, floor finishes, Flat roofs, RCC jack arch, reinforced brick concrete, solid slab and timber roofs, pitched roofs, false ceiling,roof coverings, Channel unit, cored unit, Waffle unit, Plank and Joist, Brick panel, L-Panel, Ferrocement roofing units, water proofing
.Services : Water supply & Drainage, Electrification, Fire protection, thermal insulation, Air Conditioning, Acoustics & Sound insulation, Repairs to damaged & cracked buildings, techniques and materials for low cost housing., Repairs techniques for floors & roofs.

References:
1.   Mohan Rai & M.P. Jai Singh; Advance in Building Materials & Construction,.
2.   S.C. Rangwala; Engineering Materials
3.   Sushil Kumar; Building Construction,
4.   B.C. Punmia; Building Construction ,.
5.   Building Construction, Metchell
6.   Construction Technology, Chudley R.
7.   Civil Engineering Materials, N. Jackson.
8.   Engineering Materials, Surendra Singh.

List of Experiments:
1.   Tests on Bricks
2.   Tests on Aggregates
3.   Tests on Cement
4.   Determination of compressive strength of concrete with different cement grades.
5.   Determination of workability of concrete by slump test
6.   Determination of workability by compacting factor apparatus.
7.   Determination of workability by Vee Bee consistometer.
8.   Nondestructive testing of concrete by Rebound hammer test
9.   Nondestructive testing of concrete by ultrasonic Method.
10.   Test for the effect of admixtures on the concrete compressive strength
11.   Testing of microconcrete
12.   Design of concrete mix.

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (CIVIL ENGINEERING)
SECOND YEAR
Semester –IV
Course Content & Grade

Branch	Subject Title	Subject Code
CE	**Fluid Mechanics**	**CE- 4051**

Unit-I

Turbulent flow : Laminar and turbulent boundary layers and laminar sublayer,hydrodynamically smooth andrough boundaries, velocity distribution in turbulent flow, resistance of smooth and artificially roughened pipes,commercial pipes, aging of pipes.

Pipe flow problems : Losses due to sudden expansion and contraction, losses in pipe fittings andvalves,concepts of equivalent length, hydraulic and energy gradient lines, siphon, pipes in series, pipes in parallel,branching of pipes.

Pipe Network : *Water Hammer (only quick closure case). transmission of power. *Hardy Cross Method

Unit-II

Uniform flow in open channels : Channel geometry and elements of channel section, velocity distribution,energy in open channel flow, specific energy, types of flow, critical flow and its computations, uniform flow and its computations, Chezy's and Manning's formulae, determination of normal depth and velocity, Normal and critical slopes, Economical sections, Saint Vegnet equation.

Unit-III

Non uniform flow in open channels : Basic assumptions and dynamic equations of gradually varied flow,characteristics analysis and computations of flow profiles, rapidly varied flowhydraulic jump in rectangular channels and its basic characteristics, surges in open channels & channel flow routing, venturi flume.

Unit-IV

Forces on immersed bodies: Types of drag, drag on a sphere, a flat plate, a cylinder and an aerofoil development of lift, lifting vanes, magnus effect.

Unit-V

Fluid Machines:

Turbines : Classifications, definitions, similarity laws, specific speed and unit quantities, Pelton turbine-their construction and settings, speed regulation, dimensions of various elements, Action of jet, torque, power and efficiency for ideal case, characteristic curves. Reaction turbines: construction & settings, draft tube theory, runaway speed, simple theory of design and characteristic curves, cavitation.

Pumps:
Centrifugal pumps : Various types and their important components, manometric head, total head, net positive suction head, specific speed, shut off head, energy losses, cavitation, principle of working and characteristic curves.

Reciprocating pumps: Principle of working, Coefficient of discharge, slip, single acting and double acting pump, Manometric head, Acceleration head.

List of Experiment
1. Study the performances characteristics of Pelton Wheel
2. Study the performances characteristics of Francis Turbine
3. Study the performances charactristics of Kaplan Turbine
4. Caliration of multistage (Two) Pump & Study of characteristic of variable speed pump
5. To study the performance & details of operation of Hyd. Ram
6. Determination of coefficient of discharge for a broad crested weir & to plot water surface profile over weir
7. Study of the characteristic of the Reciprocating pump

Suggested Books & Study Material:
1. Fluid Mechanics - Modi & Seth - Standard Book house, Delhi
2. Open Channel Flow by Rangaraju - Tata Mc Graw - Hill Publishing Comp. Ltd., New Delhi
3. Fluid Mechanics - A.K. Jain - Khanna Publishers, Delhi
4. Fluid Mechanics, Hydraulics & Hydraulic Machanics - K.R. Arora - Standard Publishers Distributors 1705- B, Nai Sarak, Delhi-5. Hyd. of open channels By Bakhmetiff B.A. (McGraw Hill, New York)
6. Open Channel Hyd. By Chow V.T. (McGraw Hill, New York)
7. Engineering Hydraulics By H. Rouse
8. Centrifugal & Axial Flow Pump By Stempanoff A.J. New York
9. Relevant IS codes.

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (CIVIL ENGINEERING)
SECOND YEAR
Semester –IV
Course Content & Grade

Branch	Subject Title	Subject Code
CE	**Software Lab**	**CE- 4061**

UNIT I

Introduction .NET framework, features of .Net framework, architecture and component of .Net, elements of .Net.

UNIT II

Basic Features Of C# Fundamentals, Classes and Objects, Inheritance and Polymorphism, Operator Overloading, Structures. Advanced Features Of C# Interfaces, Arrays, Indexers and Collections; Strings and Regular Expressions, Handling Exceptions, Delegates and Events.

UNIT III

Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. Windows Forms: All about windows form, MDI form, creating windows applications, adding controls to forms, handliang Events, and using various Tolls

UNIT IV

Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

UNIT V

XML: Introducing XML, Structure, and syntax of XML, document type definition (DTD), XML Schema, Document object model, Presenting and Handling XML. xml data source, using navigation controls, introduction of web parts, using java script, Web Services

References:
1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in C#; TMH
3. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli , TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH

List of Experiments/ program (Expandable):

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:

RKDF UNIVERSITY, BHOPAL
New Scheme of Examination as per AICTE Flexible Curricula
W.E.F. JULY 2019
Subject wise distribution of marks

B.E. IV Semester (Computer Science and Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz		
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	
1	CS-4011	ESC-7	Environmental Engineering	70	25	20	10	10	5	-	-	-	-	-	-	**100**
2	CS-4021	PCC-5	Database Management Systems	70	25	20	10	10	5	30	15	10	5	10	5	**150**
3	CS-4031	PCC-6	Software Engineering	70	25	20	10	10	5	30	15	10	5	10	5	**150**
4	CS-4041	PCC-7	Design and Analysis of Algorithms	70	25	20	10	10	5	30	15	10	5	10	5	**150**
5	CS-4051	PCC-8	Computer Networks	70	25	20	10	10	5	30	15	10	5	10	5	**150**
6	CS-4061	PCC-9	Software Lab-II (Java)	-	-	-	-	-	-	30	15	10	5	10	5	**50**
7	BE-4071	DLC-3	Internship-II (90 Hrs Duration) at the Institute Level	**To be completed during IV semester. Its evaluation/ credit will be added in V semester**												
			Total	**350**	**-**	**100**	**-**	**50**	**-**	**150**	**-**	**50**	**-**	**50**	**-**	**750**

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science and Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
B.E. CS	Environmental Engineering	C.S.- 4011

Unit-I

Ecosystem – Principles of ecology, ecosystem concept: Biotic and biotic components of ecosystem, Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Biodiversity: Threats and conservation, Food Chain.

Unit –II

Energy General idea about: Natural Resources , current status and types of resources Non Renewable Sources of energy, coal, oil, Gas, Hydrogen, nuclear sources

Unit –III

Air Pollution & Sound Pollution - Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution Environmental problems, (Global warming, ozone depletion and acid rain) General idea about forest ecosystem, grassland ecosystem, wetland ecosystems and aquatic Biogeochemical Cycling: Oxygen cycle, Carbon cycle, Nitrogen cycle, Sculpture cycle and water cycle.

Unit –IV

Water Pollution– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

Soil Pollution – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

Unit –V

Society & Ethics – Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, water preservation rain water collection. Environmental Impact Assessment.

References:
1.   Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics"; Cengage Pub.
2.   Rana SVS ; "Essentials of Ecology and Environment"; PHI Pub.
3.   Raynold, GW "Ethics in information Technology"; Cengage.
4.   Svakumar; Energy Environment & Ethics in society; TMH
5.   AK De "Environmental Chemistry"; New Age Int. Publ.
6.   BK Sharma, "Environmental Chemistry" ; Goel Publ. House

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science & Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
CSE	**Database Management Systems**	**CS- 4021**

UNIT I

Introduction And Conceptual Modeling : Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

UNIT II

Relational Model : SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependencies and Normalization for Relational Databases (up to BCNF).

UNIT III

Data Storage And Query Processing : Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files – Different types of Indexes-B-Tree - B+ Tree – Query Processing.

UNIT IV

Transaction Management : Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.

UNIT V

Current Trends : Object Oriented Databases – Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage – XML – Structure of XML- Data- XML Document- Schema- Querying and Transformation. – Data Mining and Data Warehousing.

TEXT BOOK :
1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", Fourth Edition, McGraw-Hill, 2002.

REFERENCES :
1. Ramez Elmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, "Database Management System", Tata McGraw-Hill Publishing Company, 2003.
3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.
4. Peter Rob and Corlos Coronel- "Database System, Design, Implementation and Management", Thompson Learning Course Technology- Fifth edition, 2003.

DBMS LAB

LIST OF EXPERIMENTS

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science & Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Software Engineering	CS- 4031

UNIT I

SOFTWARE PROCESS
Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT II

SOFTWARE REQUIREMENTS
Functional and non-functional - user – system –requirement engineering process – feasibility studies– requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping -S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT III

DESIGN CONCEPTS AND PRINCIPLES
Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems- Real time software design – system design – real time executives – data acquisition system - monitoring and control system. SCM – Need for SCM – Version control – Introduction to SCM process – Software configuration items.

UNIT IV

TESTING
Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms– regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.

UNIT V

SOFTWARE PROJECT MANAGEMENT
Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking - Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

TEXT BOOK :
1.   Roger S. Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International

Edition, 5th edition, 2001.

REFERENCES :
1.   Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
2.   Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
3.   James F Peters and Witold Pedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.

Practical and Lab work
Lab work should include a running case study problem for which different deliverables at the end of each phase of a software development life cycle are to be developed. This will include modeling the requirements, architecture and detailed design. Subsequently the design models will be coded and tested. For modeling, tools like Rational Rose products. For coding and testing, IDE like Eclipse, Net Beans, and Visual Studio can be used.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science & Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Design and Analysis of Algorithms	CS- 4041

UNIT I

BASIC CONCEPTS OF ALGORITHMS

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT II

MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm– Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT III

ANALYSIS OF SORTING AND SEARCHING ALGORITHMS

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching– Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary tree- Traversal and Related Properties – Decrease and Conquer – Insertion Sort – Depth first Search and Breadth First Search.

UNIT IV

ALGORITHMIC TECHNIQUES

Transform and conquer – Presorting – Balanced Search trees – AVL Trees – Heaps and Heap sort – Dynamic Programming – Warshall's and Floyd's Algorithm – Optimal Binary Search trees– Greedy Techniques – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman trees.

UNIT V

ALGORITHM DESIGN METHODS

Backtracking – n-Queen's Problem – Hamiltonian Circuit problem – Subset-Sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.

TEXT BOOK :

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.

REFERENCES :

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt.Ltd., 2001
2. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis",

Pearson Education Asia, 2003.

3. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis of Computer Algorithms",
    Pearson Education Asia, 2003.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Computer Science & Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
CSE	Computer Networks	CS- 4051

UNIT I
DATA COMMUNICATIONS
Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

UNIT II
DATA LINK LAYER
Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

UNIT III
NETWORK LAYER
Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting– Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT IV
TRANSPORT LAYER
Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT V
APPLICATION LAYER
Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

TEXT BOOK :
1.   Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw-Hill, 2004.

REFERENCES :
1.   James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, 2003.
2.   Larry L.Peterson and Peter S. Davie, "Computer Networks", Harcourt Asia Pvt. Ltd., Second Edition.
3.   Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.
4.   William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.
5.   Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.

NETWORKING LAB
LIST OF EXPERIMENTS
All the programs are to be written using C)
1.	Simulation of ARP / RARP.
2.	Write a program that takes a binary file as input and performs bit stuffing and CRC Computation.
3.	Develop an application for transferring files over RS232.
4.	Simulation of Sliding-Window protocol.
5.	Simulation of BGP / OSPF routing protocol.
6.	Develop a Client – Server application for chat.
7.	Develop a Client that contacts a given DNS Server to resolve a given host name.
8.	Write a Client to download a file from a HTTP Server.
9.	Study of Network Simulators like NS2/Glomosim / OPNET

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (COMPUTER SCIENCE AND ENGINEERING)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
CS	**Software Lab-II (Java)**	**CS- 4061**

UNIT-I
Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes

UNIT–II
Java Collective Frame Work - Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector.Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queue and Interface Queue, Maps, Properties Class, Un-modifiable Collections.

UNIT–III
Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

UNIT–IV
Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, Multitier Applications, Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT–V
Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:
1.   Deitel & Deitel, "JAVA, How to Program"; PHI, Pearson.
2.   E. Balaguruswamy, "Programming In Java"; TMH Publications
3.   The Complete Reference: Herbert Schildt, TMH

List of Program to be perform (Expandable)
1.   Installation of J2SDK
2.   Write a program to show Concept of CLASS in JAVA
3.   Write a program to show Type Casting in JAVA
4.   Write a program to show How Exception Handling is in JAVA
5.   Write a Program to show Inheritance
6.   Write a program to show Polymorphism

RKDF UNIVERSITY, BHOPAL
New Scheme of Examination as per AICTE Flexible Curricula
W.E.F. JULY 2019
Subject wise distribution of marks

B.E. IV Semester (Electronics and Communication Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz		
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	
1	EC-4011	BSC-5	Engineering Mathematics-III	70	25	20	10	10	5	-	-	-	-	-	-	100
2	EC-4021	PCC-5	Electronic Instrumentation and Measurement	70	25	20	10	10	5	30	15	10	5	10	5	150
3	EC-4031	PCC-6	Analog Communication	70	25	20	10	10	5	30	15	10	5	10	5	150
4	EC-4041	PCC-7	Analog Circuits	70	25	20	10	10	5	30	15	10	5	10	5	150
5	EC-4051	PCC-8	Control Systems	70	25	20	10	10	5	30	15	10	5	10	5	150
6	EC-4061	PCC-9	Software Lab-II	-	-	-	-	-	-	30	15	10	5	10	5	50
7	BE-4071	DLC-3	Internship-II (90 Hrs Duration) at the Institute Level	To be completed during IV semester. Its evaluation/ credit will be added in V semester												
			Total	350	-	100	-	50	-	150	-	50	-	50	-	750

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
B.E. EC	Engineering Mathematics-III	EC – 4011

Unit I

Fourier series: Introduction of Fourier series, Fourier series for Discontinuous functions, and Fourier series for even and odd function. Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations.

Unit II

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit III

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi, Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equations by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods.

Unit IV

Solution of Ordinary Differential Equations (Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability: Probability: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Testing of Hypothesis |: Students t-test, Fisher's z-test, Chi-Square Method.

References
(i)   Higher Engineering Mathematics by BS Grewal, Khanna Publication
(ii)   Advance Engineering Mathematics by D.G.Guffy
(iii)   Mathematics for Engineers by S.Arumungam, SCITECH Publuication
(iv)   Engineering Mathematics by S S Sastri. P.H.I.
(v)   Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
(vi)   Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
(vii)   Pobability and Statistics by Ravichandran, Wiley India
(viii) Mathematical Statistics by George R., Springer

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EC	Electronic Instrumentation and Measurement	EC - 4021

Unit-I

Measurement and Error: Accuracy and Precision, Sensitivity, Linearity, Resolution, Hysterisis, Loading Effect. Measurements of Current, Voltage, Power and Impedance: DC and AC Ammeter, DC Voltmeter-Chopper type and solid-state, AC voltmeter using Rectifier, Average, RMS, Peak Responding voltmeters, Multimeter, Power meter, Bolometer and Calorimeter.

Unit-II

Cathode Ray Oscilloscope (CRO): Different parts of CRO, Block diagram, Electrostatic focusing, Electrostatic deflection, Post deflection acceleration, Screen for CRTs, Graticules, Vertical and Horizontal deflection system, Time base circuit, Oscilloscope Probes, Applications of CRO, Special purpose CROs- Multi input, Dual trace, Dual beam, Sampling, Storage (Analog and Digital), Oscilloscope.

Unit-III

AC Bridges: Maxwell's bridge (Inductance and Inductance-Capacitance), Hay's bridge, Schering bridge (High voltage and Relative permittivity), Wein bridge, Wagner earth detector, Impedance measurement by Q-meter.
Non-Electrical Quantities (Transducer): Classification of Transducers, Strain gauge, Displacement Transducer- Linear Variable Differential Transformer (LVDT) and Rotary Variable Differential Transformer (RVDT), Temperature Transducer- Resistance Temperature Detector (RTD), Thermistor, Thermocouple, Piezo-electric transducer, Optical Transducer- Photo emissive, Photo conductive, Photo voltaic, Photo-diode, Photo Transistor, Nuclear Radiation Detector.

Unit-IV

Signal generator & Display: Signal and Function Generators, Sweep Frequency Generator, Pulse and Square Wave Generator, Beat Frequency Oscillator, Digital display system and indicators, Classification of Displays, Display devices, Light Emitting diodes(LED), Liquid Crystal Display(LCD).

Unit-V

Digital Measurement and Instruments: Advantages of Digital Instrument over Analog Instrument, Digital-to-analog conversion (DAC) - Variable resistive type, R-2R ladder Type, Binary ladder, Weighted converter using Op-amp and transistor, Practical DAC. Analog-to-digital Conversion (ADC) –Ramp Technique, Dual Slope Integrating Type, Integrating Type (voltage to frequency), Successive Approximations, digital voltmeters and multi-meters, Resolution and sensitivity of digital meter, PLC structure, principle of operation, response time and application.

References:
1. H. S. Kalsi: Electronics Instrumentation, TMH.
2. K. Sawhney: Instrumentation and Measurements, Dhanpat Rai and Co.
3. Helfric and Cooper: Modern Electronic Instrumentation and Measurement Techniques; Pearson.

List of Experiments:
All experiments (wherever applicable) should be performed through the following steps.
Step 1:   Circuit should be designed/drafted on paper.
Step 2:   The designed/drafted circuit should be simulated using Simulation Software
Step 3:   The designed/drafted circuit should be tested on the bread board and compare the results with the simulated results.
Step 4:   The bread board circuit should be fabricated on PCB by one batch using PCB machine.
1. Study of CRO and Function Generator.
2. Displacement measurement by LVDT.
3. Force measurement by strain gauge.
4. Measurement of Capacitor, Self-induction using Q-meter.
5. Temperature measurement by thermistor, RTD and thermocouple.
6. Optical Transducer- Photo conductive, Photo voltaic, Photo-diode, Photo-Transistor
7. Design of digital to analog converter.
8. PLC operation and applications (for example: relay, timer, level, traffic light etc.)

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EC	Analog Communication	EC – 4031

Unit-I

Frequency domain representation of signal: Fourier transform and its properties, condition of existence, Fourier transform of impulse, step, signum , cosine, sine, gate pulse, constant, properties of impulse function. Convolution theorem (time & frequency), correlation(auto & cross), energy & power spectral density

Unit-2

Introduction: Overview of Communication system, Communication channels Need for modulation, Baseband and Pass band signals, Amplitude Modulation: Double side band with Carrier (DSB-C), Double side band without Carrier, Single Side Band Modulation, DSB-SC, DSB-C, SSB-SC, Generation of AM, DSB-SC, SSB-SC, VSB-SC & its detection,Vestigial Side Band (VSB).

Unit-3

Types of angle modulation, narrowband FM,wideband FM, its frequency spectrum, transmission BW, methods of generation (Direct & Indirect), detection of FM (discriminators: balanced, phase shift and PLL detector),pre emphasis and de-emphasis. FM transmitter & receiver: Block diagram of FM transmitter& receiver, AGC, AVC, AFC,

Unit-4

AM transmitter& receiver: Tuned radio receiver &super heterodyne, limitation of TRF, IF frequency, image signal rejection, selectivity, sensitivity and fidelity ,Noise in AM, FM

Unit-5

Noise: Classification of noise, Sources of noise, Noise figure and Noise temperature, Noise bandwidth, Noise figure measurement, Noise in analog modulation, Figure of merit for various AM and FM, effect of noise on AM &FM receivers.

REFERENCES
 1. Simon Haykins, Communication System, John Willy
 2. Singh &Sapre, Communication System, TMH
 3. B.P. Lathi, Modern Digital and analog communication system; TMH
 4. Singhal, analog and Digital communication, TMH
 5. Rao, Analog communication, TMH
 6. P K Ghose, principal of communication of analog and digital, universities press.
7Taub& shilling, Communication System, TMH
 8. Hsu; Analog and digital communication(Schaum); TMH
 9. Proakis fundamental of communication system. (Pearson edition).

List of Experiments:

 1. To analyze characteristics of AM modulator & Demodulators.

 2. To analyze characteristics of FM modulators& Demodulators.

 3. To analyze characteristics of super heterodyne receivers.

 4. To analyze characteristics of FM receivers.

 5. To construct and verify pre emphasis and de-emphasis and plot the wave forms.

 6. To analyze characteristics of Automatic volume control and Automatic frequency control.

 7. To construct frequency multiplier circuit and to observe the waveform.

 8. To design and analyze characteristics of FM modulator and AM Demodulator using PLL.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)
SECOND YEAR
Semester –IV
Course Content& Grade

Branch	Subject Title	Subject Code
EC	Analog Circuits	EC - 4041

UNIT-I

Amplifier Basics, Transistor as an amplifier, load line, Q-point and its selection criteria, designing of fixed bias and self-bias, stability of biasing circuits, calculation of stability factor. **Transistor at low frequency**: frequency response, bandwidth, h-parameter analysis of CC, CB and CE configuration, simplified model, gain and impedance calculation of single stage amplifier.
Transistor at high frequency, high frequency model (hybrid-π), Parameters and their definition, Miller capacitance and its effect on voltage gain,

UNIT-II

Feedback amplifier: positive and negative feedback loop gain, effect of negative feedback on gain stability, distortion, bandwidth, input and output impedance of amplifier, types of feedback (voltage, current, series and shunt) and their analysis. **Oscillators**: condition of sustained oscillation, RC phase shift, LC (Hartley and Collpit) Oscillators, Wein Bridge, Negative resistance (Tunnel diode and UJT) oscillators, crystal oscillators.

UNIT-III

Power amplifier, classification, operation, analysis and design of Class A, Class B, Class-AB, Class C, transformer coupled, push pull and complementary symmetry amplifiers, power dissipation in transistors (Pdmax rating) and efficiency calculations. **Tuned amplifier** and its applications, Q factor, selectivity and bandwidth, effect of loading, double tuning (synchronous and stagger)

UNIT-IV

Operational Amplifier: Differential amplifier and analysis, Configurations-Dual input balanced output differential amplifier, Dual input Unbalanced output differential amplifier, Single input balanced output differential amplifier, Single input Unbalanced output differential amplifier Introduction of op-amp, Block diagram, characteristics and equivalent circuits of an ideal opamp, Power supply configurations for OP-AMP.
Characteristics of op-amp: Ideal and Practical, Input offset voltage, offset current, Input bias current, Output offset voltage, thermal drift, Effect of variation in power supply voltage, common-mode rejection ratio (CMRR), Slew rate and its Effect, PSRR and gain bandwidth product, frequency limitations and compensations, transient response, analysis of TL082 datasheet.
OP-AMP applications: Inverting and non-inverting amplifier configurations, Summing amplifier, Integrators and differentiators, Instrumentation amplifier, Differential input and differential output amplifier, Voltage-series feedback amplifier, Voltage-shunt feedback amplifier, Log/ Antilog amplifier, Triangular/rectangular wave generator, phase-shift oscillators, Wein bridge oscillator, analog multiplier-MPY634, VCO, Comparator, Zero Crossing Detector. OP-AMP AS FILTERS: Characteristics of filters, Classification of filters, Magnitude and frequency response, Butterworth 1st and 2nd order Low pass, High pass and band pass filters, Chebyshev filter characteristics, Band reject filters, Notch filter; all pass filters, self-tuned filters, AGC,AVC using op-AMP.

UNIT-V

TIMER: IC-555 Timer concept, Block pin configuration of timer. Monostable, Bistable and Astable Multivibrator using timer 555-IC, Schmitt Trigger, Voltage limiters, Clipper and clampers circuits, Absolute value output circuit, Peak detector, Sample and hold Circuit, Precision rectifiers, Voltage-to-current converter, Current-to-voltage convertor.

Voltage Regulator: Simple OP-AMP Voltage regulator, Fixed and Adjustable Voltage Regulators, Dual Power supply, Basic Switching Regulator and characteristics of standard regulator ICs such as linear regulator, Switching regulator andlow-drop out regulator. Study of LM317, TPS40200 and TPS7250

Differential amplifier - configuration, transfer characteristics, DC analysis, h-parameter analysis, differential and common mode gain, CMRR, constant current source and current mirror, level shift.

References:
1.   Millman and Halkias : Integrated electronics, TMH
2.   Boylestad and Nashelsky : Electronic Devices and Circuit Theory, PHI
3.   Sendra and Smith : Microelectronics, Oxford Press
4.   Graham Bell : Electronic Devices and Circuits , PHI
5.   Donald A Neamen : Electronic Circuits Analysis and Design, TMH

List of Experiments (Expandable):
All experiments (wherever applicable) should be performed through the following steps.
Step 1:   Circuit should be designed/drafted on paper.
Step 2:   The designed/drafted circuit should be tested on the bread board
Step 3:   The bread board circuit should be fabricated on PCB by one batch using PCB machine.
1.   Characteristics of Op-Amp (input offset voltage, slew rate, CMRR, BW, input bias current.
2.   Linear application of Op-Amp (voltage follower, inverting and non-inverting amplifier and their frequency response, adder, substractor, differential amplifier, integrator and differential frequency response)
3.   To design and construct a shunt and series regulator and find line and load regulation.
4.   Design and performance evaluation of transistor amplifiers in CE, CB and CC configuration
5.   Design and performance evaluation of FET amplifiers

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)
SECOND YEAR
Semester –IV
Course Content& Grade

Branch	Subject Title	Subject Code
EC	**Control Systems**	**EC - 4051**

Unit-1 Introduction to Control system: Terminology and classification of control system, examples of control system, mathematical modeling of mechanical and electrical systems, differential equations, transfer function, block diagram representation and reduction, signal flow graph techniques.

Feedback characteristics of control systems Open loop and closed loop systems, effect of feedback on control system and on external disturbances, linearization effect of feedback, regenerative feedback

Unit-2 Time response analysis Standard test signals, time response of 1st order system, time response of 2nd order system, steady -state errors and error constants, effects of additions of poles and zeros to open loop and closed loop system.

Time domain stability analysis Concept of stability of linear s ystems, effects of location of poles on stability, necessary conditions for stability, Routh -Hurwitz stability criteria, relative stability analysis, Root Locus concept, guidelines for sketching Root -Locus.

Unit-3 Frequency response analysis Correlation between time and frequency response, Polar plots, Bode Plots, all-pass and minimum-phase systems, log-magnitude versus Phase-Plots, closed-loop frequency response.

Frequency domain stability analysis : Nyquist stability criterion, assessment of relative st ability using Nyquist plot and Bode plot (phase margin, gain margin and stability).

Unit-4 Approaches to system design Design problem, types of compensation techniques, design of phase-lag, phase lead and phase lead-lag compensators in time and frequency domain, proportional, derivative, integral and Composite Controllers.

Unit-5 State space representation of systems, block diagram for state equation, transfer function decomposition, solution of state equation, transfer matrix, relationship between state equation and transfer function, controllability and observability.

Text/Reference Books:

1. Albert D. Helfrick, William David Cooper, "Modern electronic instrumentation and measurement techniques", TMH 2008.
2. Oliver Cage, "Electronic Measurements and Instrumentation", TMH, 2009.
3. Alan S. Morris, "Measurement and Instrumentation Principles", Elsevier (Buterworth Heinmann), 2008.
4. David A. Bell, "Electronic Instrumentation and Measurements", 2nd Ed., PHI, New Delhi 2008.
5. H.S. Kalsi, "Electronics Instrument ation", TMH Ed. 2004
6. A.K.Sawhney, "A Course in Electrical and Electronic Measurements and Instrumentation", Dhanpat Rai.
7. MMS Anand, "Electronic Instruments & Instrumentation Technology", PHI Pvt. Ltd., New Delhi Ed. 2005

CONTROL SYSTEM LAB

Control System performance analysis and applications of MATLAB in Control system performance analysis

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electronics & Communication Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EC	**Software Lab- II**	**EC – 4061**

Course Contents

ADVANCED SIMULATION/ VERIFICATION SOFTWARE
Study of simulation/ verification software (any one- LAB-VIEW/KTECHLAB/ GNU CIRCUIT ANALYSIS PACKAGE/ LOGISIM/ MULTISIM/ SCILAB etc).

Overview and Study of the key features and applications of the software. Application of the software in the field of Electronic Circuits, Digital Electronics and Analog Communication. Design, Optimization, simulation and verification of

1. Electronic circuits (example amplifiers, oscillators etc).
2. Realization and verification of various digital electronic circuits (example logic gates, adders, subtractors etc)
3. Realization of various signals and communication link etc.
   Students should simulate and verify at least six circuits they are learning in the current semester.

RKDF UNIVERSITY, BHOPAL
New Scheme of Examination as per AICTE Flexible Curricula
W.E.F. JULY 2019
Subject wise distribution of marks

B.E. IV Semester (Electrical Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz		
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	
1	EE-4011	BSC-5	Engineering Mathematics-III	70	25	20	10	10	5	-	-	-	-	-	-	**100**
2	EE-4021	PCC-5	Electrical Machines-I	70	25	20	10	10	5	30	15	10	5	10	5	**150**
3	EE-4031	PCC-6	Analog and Digital Communication	70	25	20	10	10	5	30	15	10	5	10	5	**150**
4	EE-4041	PCC-7	Electrical Engineering Drawing	70	25	20	10	10	5	30	15	10	5	10	5	**150**
5	EE-4051	PCC-8	Power Systems-I	70	25	20	10	10	5	30	15	10	5	10	5	**150**
6	EE-4061	PCC-9	Simulation Lab-I	-	-	-	-	-	-	30	15	10	5	10	5	**50**
7	BE-4071	DLC-3	Internship-II (90 Hrs Duration) at the Institute Level	To be completed during IV semester. Its evaluation/ credit will be added in V semester												
			Total	**350**	**-**	**100**	**-**	**50**	**-**	**150**	**-**	**50**	**-**	**50**	**-**	**750**

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (Electrical Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
B.E. EE	Engineering Mathematics-III	E.E.- 4011

Unit I

Fourier series: Introduction of Fourier series, Fourier series for Discontinuous functions, and Fourier series for even and odd function. Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations.

Unit II

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit III

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi, Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equations by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods.

Unit IV

Solution of Ordinary Differential Equations (Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability: Probability: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Testing of Hypothesis |: Students t-test, Fisher's z-test, Chi-Square Method.

References
(i)   Higher Engineering Mathematics by BS Grewal, Khanna Publication
(ii)   Advance Engineering Mathematics by D.G.Guffy
(iii)   Mathematics for Engineers by S.Arumungam, SCITECH Publuication
(iv)   Engineering Mathematics by S S Sastri. P.H.I.
(v)   Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
(vi)   Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
(vii)   Pobability and Statistics by Ravichandran, Wiley India
(viii)   Mathematical Statistics by George R., Springer

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EE	**Electrical Machines - I**	**EE - 4021**

UNIT I

ELECTRO MAGNETIC INDUCTION & BASIC CONCEPTS IN ROTATING MACHINES
Introduction to magnetic circuits – Magnetically induced e.m.f and force – AC operation of magnetic circuits – Hysteresis and Eddy current losses. Energy in magnetic systems – Field energy & mechanical force – Single and Multiple excited systems. MMF of distributed windings – Magnetic fields in rotating machines – Generated voltages – Torque.

UNIT II

DC GENERATORS
Constructional features of DC machine – Principle of operation of DC generator – EMF equation – Types of excitation – No load and load characteristics of DC generators – commutation – armature reaction – Parallel operation of DC generators.

UNIT III

DC MOTORS
Principle of operation of DC motors-Back emf – Torque equation –Types of DC motors-Speed – Torque characteristics of DC motors – Starting of DC motors: 2 point starter, 3 point starter, 4 point starter – Speed control – Losses and efficiency –Applications

UNIT IV

TRANSFORMERS
Principle of operation – Constructional features of single phase and three phase transformers – EMF equation – Transformer on No load and Load –Phasor diagram --equivalent circuit – Regulation - three phase transformer connections-parallel operations of single phase and three phase transformer- Auto transformers.

UNIT V

SINGLE PHASE INDUCTION MOTOR
Single phase induction motors – Double revolving field theory – Torque – Speed characteristics – Equivalent circuit – No load and Blocked rotor test - Performance analysis – Starting methods of Single phase motors – Special motors: shaded pole motor, reluctance motor, repulsion motor, linear induction motor.

Text Books:
1.   Electrical Machines by Nagrath and Kothari (TMH).
2.   A.C. Machines by Langs dorf (McGraw-Hill)
3.   Electrical Machines by Dr.P.S.Bimbhra (Khanna).
4.   Electrical Machines by Ashfaq Hussain. (Dhanpat Rai).

List of Experiments (expandable)
Experiments can cover any of the above topics, following is a suggestive list:
1.   Perform turn ratio and polarity test on 1-phase transformer
2.   Perform load test on a 1-phase transformer and plot its load characteristic
3.   Perform OC and SC tests on a 1-phase transformer and determine its equivalent circuit. Also find its efficiency and regulation at different load and power factor.
4.   Perform OC and SC tests on a 3-phase transformer and determine its equivalent circuit. Also find its efficiency and regulation at different load and power factor.
5.   Perform Sumpner's test on two 1-phase transformer and determine its efficiency at various load.
6.   Perform No-load and block rotor test on a 3- phase IM and determine its equivalent circuit.
7.   Perform load test on a 3- phase IM and plot its performance characteristics.
8.   Study various types of starters used for 3- IMs.
9.   Perform No-load and block rotor test on a 1- phase IM and determine its equivalent circuit.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EE	Digital Electronics	EE - 4031

Unit I

Number Systems and Codes : Digital number systems, base conversion, Binary, Decimal, octal, Hexadecimal, number system with radix r, Gray codes. Alphanumeric codes – ASCII code and EBCDIC codes, Hollerith code, concept of parity, complement's & (r-1)'s, subtraction with complements, signed Binary numbers, Error Detecting &Correcting codes. Basic Theorems & Properties of Boolean Algebra: AND, OR, NOT operators, laws of Boolean Algebra, Demorgon's theorem, Boolean expression & logic diagram. Negative logic, Alternate logic gate representation (concept of bubbled gates) canonical and standard Forms (Minterms & Maxterms), sum of minterms & product of maxterms, conversion between canonical forms. Truth table & maps, 2,3,4,5 and 6 variable maps, Solving digital problems using Maps, Don't care conditions, Tabular minimization. Sum of product & product of sum reduction, Exclusive OR &Exclusive NOR circuits, Parity generator & checkers.

Unit II

Combinational Circuits : Design procedure, Adders (half and Full), sub tractor (half and full) code convertors, Analysis of design, Universal building blocks, Implementation of any logic circuit with only NAND gates or with only NOR gates, Binary serial adder, parallel adder, serial/parallel adder, look ahead carry generator, BCD adder, Binary multiplier, Magnitude comparator, Decoder,Demultiplexer, Encoders, priority encoder, Multiplexers & implementation of combinational logic diagram, HDL for combinational circuit.

Unit III

Sequential Logic Circuit : Latches, SR latch with NAND & NOR gates, D latch, edge triggered flip flop, J-K flip flop, T flip flop, Master slave flip flop, Analysis of clocked sequential circuit, state table, state diagram, state reduction state equations, state assignments, flip flop excitation table &characteristic equations, Design procedure for sequential circuits, Design with state reduction, Applications of flip flop.

Unit IV

Registers and Counters : Asynchronous and Synchronous counter, counters with MOD numbers, Down counter, UP/DOWN counter, propagation delay in ripple counter, programmable counter, Pre-settable counter, BCD counter, cascading, counter applications, Decoding in counted coding glitches, Ring Counter, Johnson counter, Rotate left & Rotate right counter, Registers – Buffer, Shift left, shift right, shift left/Right registers, parallel in parallel out, serial in seout, parallel in serial out, serial in parallel out registers.

Unit V

Random Access Memory, Timing waveform, Memory Decoding, Internal Construction, Coincident decoding, Address multiplexing, Read only memory – Combinational circuit Implementation, Type of ROMs, combinational PLDs, Programmable Logic Array (PLA),
Programmable Array Logic (PAL), sequential programmable device. Analog to digital conversion Ramp type, dual slope, integration, successive approximation, parallel conversion, parallel/ serial conversion, convertor specifications, Digital to Analog convertors – Binary weighted & R/2R D to A convertors.

References:
1.   Mano; Digital design; Pearson Education Asia
2.   Thomas Blakeslee; Digital Design with standard MSI and LSI; Wiley Interscience
3.   Jain RP; Modern digital electronics; TMH
4.   M.Mano; Digital logic & Computer Design; PHI
5.   Tocci ; Digital Systems Principle & applications; Pearson Education Asia
6.   Gothmann; Digital Electronics; PHI
7.   R.H.Gour; Digital Electronics and Micro Computer - (Dhanpat Rai)

List of Experiments (Expandable):
1.   Verification of all the logic gates.
2.   Design of BCD to Excess-3 code converter.
3.   Implementation of NAND & NOR as Universal gate.
4.   Design of RS, JK, T& D Flip flop.
5.   Multiplexer /Demultipexer based boolean function
6.   Design of combinational circuit for the
        (i)   Half adder
        (ii)   Full adder
        (iii)   Half subtractor
        (iv)   Full subtractor
7.   Design various A-D & D-A convertors.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EE	**Electrical Engineering Drawing**	**EE - 4041**

UNIT-I

Introduction to general purpose graphics software, AutoCAD, plotting techniques, coordinate systems, line drawings, polygon and circle generation, drawing entity commands of computer drafting. Sectional and dimensional drawing using computer.

UNIT-II

Conventional Symbols and brief introduction to electrical equipments and electronic devices, measuring instruments, parts of MI and MC instruments.

UNIT-III

Sectional drawing of different types of Cables, overhead conductors, wiring systems, domestic, staircase and godown wiring, wiring installation in small residences.

UNIT-IV

Mounting and types of enclosures for electric motors , types of transformer and their parts, core construction, sectional view of 1-phase and 3-phase transformers, H.T and L.T windings. DC machine and its parts, construction of pole, yoke and field coils, commutator and its details.

UNIT-V

Sketches of transmission line structures, types of towers, insulating equipments, single line diagram of power substation.

Reference Books:
1.   Electrical Drawing -K.L.Narang
2.   Engineering Drawing - N.D.Bhatt
3.   Engineering Drawing with AutoCAD - T.Jayapoorva
4.   Electrical Engineering Drawing (Part I & II) - Surjit singh

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EE	**Power System-I**	EE - 4051

UNIT-I

Electrical Design of Lines:
Layout of different transmission and distribution systems, advantages of high voltage transmission, concept of short, medium and long lines, parameters of lines, performance of short lines (Regulation, efficiency, vector diagrams) corona formation and its effects on performance of lines.

UNIT-II

Transmission Systems:
Various system of transmission & their comparison, HVDC transmission Converter, inverter, filters & substation layout. Voltage and Reactive Power control. Types of supports, types of conductors, types of insulators, their properties, selection and testing, voltage distribution of string insulators, equalization of potential. Vibration dampers various system of transmission & their comparison, HVDC transmission Converter, inverter, filters & substation layout. Voltage and Reactive Power control.

UNIT-III

Distribution System
Distribution Systems: Primary and secondary distribution systems, concentrated & uniformly distributed loads on distributors fed at one and both ends, ring distribution, sub mains and tapered mains, voltage drop and power loss calculations, voltage regulators, Feeders Kelvin's law and modified Kelvin's law for feeder conductor size and its limitations.
Construction of Distribution Lines: Erection of pole, fixing of insulators on conductors, testing, operation and maintenance of lines.

UNIT IV

Overhead Transmission Lines:
Types of Conductors, Line Parameters: calculation of inductance and capacitance of single and double circuit transmission lines, three phase lines with stranded and bundle conductors, Generalized ABCD constants and equivalent circuits of short, medium & long lines. Line Performance: circle diagram, regulation and efficiency of short, medium and long lines, Series and shunt compensation, FACTS.

UNIT V

Underground Cables
Classification, Construction and characteristic of different types. Insulation resistance And capacitance, grading (capacitance and inter sheath), laying, jointing and splicing of cables. Phenomenon of dielectric losses, dielectric stress and sheath loss in cables.

Carrier Communication: Principle of carrier communication over Power Lines, purposes,
Equipment, differences between radio transmission and carrier communication, block diagram.

References:
1. Nagrath IJ and Kothari DP; "Power System Engineering", Tata McGraw Hill
2. John S. Grainger and W. D. Stevenson Jr.," Power System Analysis", McGraw Hill.
3. Deshpande MV; "Electric Power System Design", TMH.
4. Central Electricity Generating Board; "Modem Power System Practice", Vol 1-8, Pergamon Oxfd
5. James J. Burke," Power Distribution Engineering: Fundamentals & Applications"; Marcel Dekker
6. Westinghouse Electric Corp; Electric Transmission & Distribution Reference Book; East Pittsbrg
7. Wadhwa CL; " Electric Power Systems"; Wiley Eastern Limited.
8. Ashfaq Hussain; "Electrical Power System
9. Gupta BR; "Power System Analysis and Design"
10. Ray " Electrical Power System:Concepts, Theory and practice", PHI

List of Experiment
Subject- Power System I
1. To study the Thermal Power Station.
2. To study the Hydro Power Station.
3. To study the Nuclear Power Station.
4. To study & draw Towers used in Transmission lines.
5. To study & draw the different types of insulator.
6. To study & design Electrical Power Transmission line.
7. Determination of Transmission Parameters of a transmission line.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EE	Java Programming	EE - 4061

UNIT-I

Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes

UNIT–II

Java Collective Frame Work - Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector. Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queue and Interface Queue, Maps, Properties Class, Un-modifiable Collections.

UNIT–III

Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

UNIT–IV

Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, MultitierApplications,Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT–V

Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:
1. Deitel & Deitel, ”JAVA, How to Program”; PHI, Pearson.
2. E. Balaguruswamy, "Programming In Java"; TMH Publications
3. The Complete Reference: Herbert Schildt, TMH
4. Peter Norton, "Peter Norton Guide To Java Programming", Techmedia.
5. Merlin Hughes, et al; Java Network Programming , Manning Publications/Prentice Hall

List of Program to be perform (Expandable)
1. Installation of J2SDK
2. Write a program to show Concept of CLASS in JAVA
3. Write a program to show Type Casting in JAVA
4. Write a program to show How Exception Handling is in JAVA
5. Write a Program to show Inheritance and Polymorphism
6. Write a program to show Interfacing between two classes
7. Write a program to Add a Class to a Package
8. Write a program to demonstrate AWT.
9. Write a program to Hide a Class

RKDF UNIVERSITY, BHOPAL
New Scheme of Examination as per AICTE Flexible Curricula
W.E.F. JULY 2019
Subject wise distribution of marks

B.E. IV Semester (Electrical and Electronics Engineering)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz		
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	
1	EX-4011	BSC-5	Engineering Mathematics-III	70	25	20	10	10	5	-	-	-	-	-	-	100
2	EX-4021	PCC-5	Electrical Machines-I	70	25	20	10	10	5	30	15	10	5	10	5	150
3	EX-4031	PCC-6	Digital Electronics	70	25	20	10	10	5	30	15	10	5	10	5	150
4	EX-4041	PCC-7	Electrical Engineering Drawing	70	25	20	10	10	5	30	15	10	5	10	5	150
5	EX-4051	PCC-8	Power Systems-I	70	25	20	10	10	5	30	15	10	5	10	5	150
6	EX-4061	PCC-9	Java Programming	-	-	-	-	-	-	30	15	10	5	10	5	50
7	BE-4071	DLC-3	Internship-II (90 Hrs Duration) at the Institute Level	To be completed during IV semester. Its evaluation/ credit will be added in V semester												
			Total	350	-	100	-	50	-	150	-	50	-	50	-	750

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (Electrical and Electronics Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
B.E. EEE	Engineering Mathematics-III	E.X.- 4011

Unit I

Fourier series: Introduction of Fourier series, Fourier series for Discontinuous functions, and Fourier series for even and odd function. Laplace Transform: Introduction of Laplace Transform, Laplace Transform of elementary functions, properties of Laplace Transform, Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform & its properties, Convolution theorem, Applications of L.T. to solve the ordinary differential equations.

Unit II

Difference Operators, Interpolation (Newton Forward & Backward Formulae, Central Interpolation Formulae, Lagrange's and divided difference formulae), Numerical Differentiation and Numerical Integration.

Unit III

Errors & Approximations, Solution of Algebraic & Trancedental Equations (Regula Falsi, Newton-Raphson, Iterative, Secant Method), Solution of simultaneous linear equations by Gauss Elimination, Gauss Jordan, Crout's methods , Jacobi's and Gauss-Siedel Iterative methods.

Unit IV

Solution of Ordinary Differential Equations (Taylor's Series, Picard's Method, Modified Euler's Method, Runge-Kutta Method, Milne's Predictor & Corrector method), Correlation and Regression, Curve Fitting (Method of Least Square).

Unit V

Concept of Probability: Probability: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Testing of Hypothesis |: Students t-test, Fisher's z-test, Chi-Square Method.

References
(i)   Higher Engineering Mathematics by BS Grewal, Khanna Publication
(ii)   Advance Engineering Mathematics by D.G.Guffy
(iii)   Mathematics for Engineers by S.Arumungam, SCITECH Publuication
(iv)   Engineering Mathematics by S S Sastri. P.H.I.
(v)   Numerical Methods for Scientific and Engg. Computation by MKJain, Iyengar and RK Jain, New Age International Publication
(vi)   Mathematical Methods by KV Suryanarayan Rao, SCITECH Publuication
(vii)   Pobability and Statistics by Ravichandran, Wiley India
(viii) Mathematical Statistics by George R., Springer

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical & Electronics Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EEE	Electrical Machines- I	EX - 4021

UNIT I

ELECTRO MAGNETIC INDUCTION & BASIC CONCEPTS IN ROTATING MACHINES
Introduction to magnetic circuits – Magnetically induced e.m.f and force – AC operation of magnetic circuits – Hysteresis and Eddy current losses. Energy in magnetic systems – Field energy & mechanical force – Single and Multiple excited systems. MMF of distributed windings – Magnetic fields in rotating machines – Generated voltages – Torque.

UNIT II

DC GENERATORS
Constructional features of DC machine – Principle of operation of DC generator – EMF equation – Types of excitation – No load and load characteristics of DC generators – commutation – armature reaction – Parallel operation of DC generators.

UNIT III

DC MOTORS
Principle of operation of DC motors-Back emf – Torque equation –Types of DC motors-Speed – Torque characteristics of DC motors – Starting of DC motors: 2 point starter, 3 point starter, 4 point starter – Speed control – Losses and efficiency –Applications

UNIT IV

TRANSFORMERS
Principle of operation – Constructional features of single phase and three phase transformers – EMF equation – Transformer on No load and Load –Phasor diagram --equivalent circuit – Regulation - three phase transformer connections-parallel operation of single phase and three phase transformer- Auto transformers

UNIT V

SINGLE PHASE INDUCTION MOTOR
Single phase induction motors – Double revolving field theory – Torque – Speed characteristics – Equivalent circuit – No load and Blocked rotor test - Performance analysis – Starting methods of Single phase motors – Special motors: shaded pole motor, reluctance motor, repulsion motor, linear induction motor.

Text Books:
1. Electrical Machines by Nagrath and Kothari (TMH).
2. A.C. Machines by Langs dorf (McGraw-Hill)
3. Electrical Machines by Dr.P.S.Bimbhra (Khanna).
4. Electrical Machines by Ashfaq Hussain. (Dhanpat Rai).

List of Experiments (expandable)
Experiments can cover any of the above topics, following is a suggestive list:
1. Perform turn ratio and polarity test on 1-phase transformer
2. Perform load test on a 1-phase transformer and plot its load characteristic
3. Perform OC and SC tests on a 1-phase transformer and determine its equivalent circuit. Also find its efficiency and regulation at different load and power factor.
4. Perform OC and SC tests on a 3-phase transformer and determine its equivalent circuit. Also find its efficiency and regulation at different load and power factor.
5. Perform Sumpner's test on two 1-phase transformer and determine its efficiency at various load.
6. Perform No-load and block rotor test on a 3- phase IM and determine its equivalent circuit.
7. Perform load test on a 3- phase IM and plot its performance characteristics.
8. Study various types of starters used for 3- IMs.
9. Perform No-load and block rotor test on a 1- phase IM and determine its equivalent circuit.

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B.E. (Electrical and Electronics Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EEE	Digital Electronics	EX - 4031

Unit I

Number Systems and Codes : Digital number systems, base conversion, Binary, Decimal, octal, Hexadecimal, number system with radix r, Gray codes. Alphanumeric codes – ASCII code and EBCDIC codes, Hollerith code, concept of parity, complement's & (r-1)'s, subtraction with complements, signed Binary numbers, Error Detecting &Correcting codes. Basic Theorems & Properties of Boolean Algebra: AND, OR, NOT operators, laws of Boolean Algebra, Demorgon's theorem, Boolean expression & logic diagram. Negative logic, Alternate logic gate representation (concept of bubbled gates) canonical and standard Forms (Minterms & Maxterms), sum of minterms & product of maxterms, conversion between canonical forms. Truth table & maps, 2,3,4,5 and 6 variable maps, Solving digital problems using Maps, Don't care conditions, Tabular minimization. Sum of product & product of sum reduction, Exclusive OR &Exclusive NOR circuits, Parity generator & checkers.

Unit II

Combinational Circuits : Design procedure, Adders (half and Full), sub tractor (half and full) code convertors, Analysis of design, Universal building blocks, Implementation of any logic circuit with only NAND gates or with only NOR gates, Binary serial adder, parallel adder, serial/parallel adder, look ahead carry generator, BCD adder, Binary multiplier, Magnitude comparator, Decoder,Demultiplexer, Encoders, priority encoder, Multiplexers & implementation of combinational logic diagram, HDL for combinational circuit.

Unit III

Sequential Logic Circuit : Latches, SR latch with NAND & NOR gates, D latch, edge triggered flip flop, J-K flip flop, T flip flop, Master slave flip flop, Analysis of clocked sequential circuit, state table, state diagram, state reduction state equations, state assignments, flip flop excitation table &characteristic equations, Design procedure for sequential circuits, Design with state reduction, Applications of flip flop.

Unit IV

Registers and Counters : Asynchronous and Synchronous counter, counters with MOD numbers, Down counter, UP/DOWN counter, propagation delay in ripple counter, programmable counter, Pre-settable counter, BCD counter, cascading, counter applications, Decoding in counted coding glitches, Ring Counter, Johnson counter, Rotate left & Rotate right counter, Registers – Buffer, Shift left, shift right, shift left/Right registers, parallel in parallel out, serial in seout, parallel in serial out, serial in parallel out registers.

Unit V

Random Access Memory, Timing waveform, Memory Decoding, Internal Construction, Coincident decoding, Address multiplexing, Read only memory – Combinational circuit Implementation, Type of ROMs, combinational PLDs, Programmable Logic Array (PLA),
Programmable Array Logic (PAL), sequential programmable device. Analog to digital conversion Ramp type, dual slope, integration, successive approximation, parallel conversion, parallel/ serial conversion, convertor specifications, Digital to Analog convertors – Binary weighted & R/2R D to A convertors.

References:
1.   Mano; Digital design; Pearson Education Asia
2.   Thomas Blakeslee; Digital Design with standard MSI and LSI; Wiley Interscience
3.   Jain RP; Modern digital electronics; TMH
4.   M.Mano; Digital logic & Computer Design; PHI
5.   Tocci ; Digital Systems Principle & applications; Pearson Education Asia
6.   Gothmann; Digital Electronics; PHI
7.   R.H.Gour; Digital Electronics and Micro Computer - (Dhanpat Rai)

List of Experiments (Expandable):
1.   Verification of all the logic gates.
2.   Design of BCD to Excess-3 code converter.
3.   Implementation of NAND & NOR as Universal gate.
4.   Design of RS, JK, T& D Flip flop.
5.   Multiplexer /Demultipexer based boolean function
6.   Design of combinational circuit for the
        (i)   Half adder
        (ii)   Full adder
        (iii)   Half subtractor
        (iv)   Full subtractor
7.   Design various A-D & D-A convertors.

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B.E. (Electrical and Electronics Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EEE	**Electrical Engineering Drawing**	EX - 4041

UNIT-I

Introduction to general purpose graphics software, AutoCAD, plotting techniques, coordinate systems, line drawings, polygon and circle generation, drawing entity commands of computer drafting. Sectional and dimensional drawing using computer.

UNIT-II

Conventional Symbols and brief introduction to electrical equipments and electronic devices, measuring instruments, parts of MI and MC instruments.

UNIT-III

Sectional drawing of different types of Cables, overhead conductors, wiring systems, domestic, staircase and godown wiring, wiring installation in small residences.

UNIT-IV

Mounting and types of enclosures for electric motors , types of transformer and their parts, core construction, sectional view of 1-phase and 3-phase transformers, H.T and L.T windings. DC machine and its parts, construction of pole, yoke and field coils, commutator and its details.

UNIT-V

Sketches of transmission line structures, types of towers, insulating equipments, single line diagram of power substation.

Reference Books:
1.   Electrical Drawing -K.L.Narang
2.   Engineering Drawing - N.D.Bhatt
3.   Engineering Drawing with AutoCAD - T.Jayapoorva
4.   Electrical Engineering Drawing (Part I & II) - Surjit singh

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B.E. (Electrical and Electronics Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EEE	**Power System-I**	EX - 4051

UNIT-I

Electrical Design of Lines:
Layout of different transmission and distribution systems, advantages of high voltage transmission, concept of short, medium and long lines, parameters of lines, performance of short lines (Regulation, efficiency, vector diagrams) corona formation and its effects on performance of lines.

UNIT-II

Transmission Systems:
Various system of transmission & their comparison, HVDC transmission Converter, inverter, filters & substation layout. Voltage and Reactive Power control. Types of supports, types of conductors, types of insulators, their properties, selection and testing, voltage distribution of string insulators, equalization of potential. Vibration dampers various system of transmission & their comparison, HVDC transmission Converter, inverter, filters & substation layout. Voltage and Reactive Power control.

UNIT-III

Distribution System
Distribution Systems: Primary and secondary distribution systems, concentrated & uniformly distributed loads on distributors fed at one and both ends, ring distribution, sub mains and tapered mains, voltage drop and power loss calculations, voltage regulators, Feeders Kelvin's law and modified Kelvin's law for feeder conductor size and its limitations.
Construction of Distribution Lines: Erection of pole, fixing of insulators on conductors, testing, operation and maintenance of lines.

UNIT IV

Overhead Transmission Lines:
Types of Conductors, Line Parameters: calculation of inductance and capacitance of single and double circuit transmission lines, three phase lines with stranded and bundle conductors, Generalized ABCD constants and equivalent circuits of short, medium & long lines. Line Performance: circle diagram, regulation and efficiency of short, medium and long lines, Series and shunt compensation, FACTS.

UNIT V

Underground Cables
Classification, Construction and characteristic of different types. Insulation resistance And capacitance, grading (capacitance and inter sheath), laying, jointing and splicing of cables. Phenomenon of dielectric losses, dielectric stress and sheath loss in cables.

Carrier Communication: Principle of carrier communication over Power Lines, purposes,
Equipment, differences between radio transmission and carrier communication, block diagram.

References:
1.   Nagrath IJ and Kothari DP; "Power System Engineering", Tata McGraw Hill
2.   John S. Grainger and W. D. Stevenson Jr.," Power System Analysis", McGraw Hill.
3.   Deshpande MV; "Electric Power System Design", TMH.
4.   Central Electricity Generating Board; "Modem Power System Practice", Vol 1-8, Pergamon Oxfd
5.   James J. Burke," Power Distribution Engineering: Fundamentals & Applications"; Marcel Dekker
6.   Westinghouse Electric Corp; Electric Transmission & Distribution Reference Book; East Pittsbrg
7.   Wadhwa CL; " Electric Power Systems"; Wiley Eastern Limited.
8.   Ashfaq Hussain; "Electrical Power System
9.   Gupta BR; "Power System Analysis and Design"
10.   Ray " Electrical Power System:Concepts, Theory and practice", PHI

List of Experiment
Subject- Power System I
1.   To study the Thermal Power Station.
2.   To study the Hydro Power Station.
3.   To study the Nuclear Power Station.
4.   To study & draw Towers used in Transmission lines.
5.   To study & draw the different types of insulator.
6.   To study & design Electrical Power Transmission line.
7.   Determination of Transmission Parameters of a transmission line.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Electrical and Electronics Engineering)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
EEE	Java Programming	EX - 4061

UNIT-I

Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes

UNIT–II

Java Collective Frame Work - Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector. Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queue and Interface Queue, Maps, Properties Class, Un-modifiable Collections.

UNIT–III

Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

UNIT–IV

Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, MultitierApplications,Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT–V

Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:
1.   Deitel & Deitel, "JAVA, How to Program"; PHI, Pearson.
2.   E. Balaguruswamy, "Programming In Java"; TMH Publications
3.   The Complete Reference: Herbert Schildt, TMH
4.   Peter Norton, "Peter Norton Guide To Java Programming", Techmedia.
5.   Merlin Hughes, et al; Java Network Programming , Manning Publications/Prentice Hall

List of Program to be perform (Expandable)
1.   Installation of J2SDK
2.   Write a program to show Concept of CLASS in JAVA
3.   Write a program to show Type Casting in JAVA
4.   Write a program to show How Exception Handling is in JAVA
5.   Write a Program to show Inheritance and Polymorphism
6.   Write a program to show Interfacing between two classes
7.   Write a program to Add a Class to a Package
8.   Write a program to demonstrate AWT.
9.   Write a program to Hide a Class

RKDF UNIVERSITY, BHOPAL
New Scheme of Examination as per AICTE Flexible Curricula
W.E.F. JULY 2019
Subject wise distribution of marks

B.E. IV Semester (Information Technology)

S. No.	Subject Code	Category	Subject Name	Theory Slot						Practical Slot						Total Marks
				Theory		Mid Sem		Quiz Assignment		Practical		Lab Work		Lab Quiz		
				Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	Max. Marks	Min. Marks	
1	IT-4011	ESC-7	Environmental Engineering	70	25	20	10	10	5	-	-	-	-	-	-	100
2	IT-4021	PCC-5	Database Management Systems	70	25	20	10	10	5	30	15	10	5	10	5	150
3	IT-4031	PCC-6	Software Engineering	70	25	20	10	10	5	30	15	10	5	10	5	150
4	IT-4041	PCC-7	Analog and Digital Communications	70	25	20	10	10	5	30	15	10	5	10	5	150
5	IT-4051	PCC-8	Computer Networks	70	25	20	10	10	5	30	15	10	5	10	5	150
6	IT-4061	PCC-9	Software Lab-II (Java)	-	-	-	-	-	-	30	15	10	5	10	5	50
7	BE-4071	DLC-3	Internship-II (90 Hrs Duration) at the Institute Level	To be completed during IV semester. Its evaluation/ credit will be added in V semester												
			Total	350	-	100	-	50	-	150	-	50	-	50	-	750

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Information Technology)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
B.E. IT	**Environmental Engineering**	**IT- 4011**

Unit-I

Ecosystem – Principles of ecology, ecosystem concept: Biotic and biotic components of ecosystem, Segments of Environment: Atmosphere, hydrosphere, Lithosphere, biosphere. Biodiversity: Threats and conservation, Food Chain.

Unit –II

Energy General idea about: Natural Resources , current status and types of resources Non Renewable Sources of energy, coal, oil, Gas, Hydrogen, nuclear sources

Unit –III

Air Pollution & Sound Pollution - Air Pollution: Air pollutants, classification, (Primary & secondary Pollutants) Adverse effects of pollutants. Causes of Air pollution Environmental problems, (Global warming, ozone depletion and acid rain) General idea about forest ecosystem, grassland ecosystem, wetland ecosystems and aquatic Biogeochemical Cycling: Oxygen cycle, Carbon cycle, Nitrogen cycle, Sculpture cycle and water cycle.

Unit –IV

Water Pollution– Water Pollution: Pollutants in water, adverse effects. Treatment of Domestic & Industrial water effluent.

Soil Pollution – Soil Profile, Pollutants in soil, their adverse effects, controlling measures.

Unit –V

Society & Ethics – Impact of waste on society. Solid waste management (Nuclear, Thermal, Plastic, medical, Agriculture, domestic and e-waste). Ethics and moral values, ethical situations, water preservation rain water collection. Environmental Impact Assessment.

References:
1.   Harris, CE, Prichard MS, Rabin's MJ, "Engineering Ethics"; Cengage Pub.
2.   Rana SVS ; "Essentials of Ecology and Environment"; PHI Pub.
3.   Raynold, GW "Ethics in information Technology"; Cengage.
4.   Svakumar; Energy Environment & Ethics in society; TMH
5.   AK De "Environmental Chemistry"; New Age Int. Publ.
6.   BK Sharma, "Environmental Chemistry" ; Goel Publ. House

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Informational Technology)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
IT	**Database Management Systems**	IT - 4021

UNIT I

INTRODUCTION AND CONCEPTUAL MODELING
Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

UNIT II

RELATIONAL MODEL
SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependencies and Normalization for Relational Databases (up to BCNF).

UNIT III

DATA STORAGE AND QUERY PROCESSING
Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes-B-Tree - B+ Tree – Query Processing.

UNIT IV

TRANSACTION MANAGEMENT
Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.

UNIT V

CURRENT TRENDS
Object Oriented Databases – Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage – XML – Structure of XML- Data- XML Document- Schema- Querying and Transformation. – Data Mining and Data Warehousing.

TEXT BOOK :
1.   Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", Fourth Edition, McGraw-Hill, 2002.

REFERENCES :
1. Ramez Elmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, "Database Management System", Tata McGraw-Hill Publishing Company, 2003.
3. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.
4. Peter Rob and Corlos Coronel- "Database System, Design, Implementation and Management", Thompson Learning Course Technology- Fifth edition, 2003.

DBMS LAB

LIST OF EXPERIMENTS
1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.

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B.E. (Informational Technology)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
IT	**Software Engineering**	**IT - 4031**

UNIT I

INTRODUCTION
Product Life Cycle, Project Life Cycle models, Process models.

UNIT II

UMBRELLA ACTIVITIES IN SOFTWARE PROJECT MANAGEMENT
Matrix, Software configuration Management, Software Quality Assurance, Risk Management.

UNIT III

PROJECT MANAGEMENT PROCESSES AND ACTIVITIES
Project Initiation, Project Planning and Tracking, Project closure.

UNIT IV

ENGINEERING ACTIVITIES
Software requirements, Gathering, Estimation, Design and development Phase, Project Management in the testing phase and maintenance phase.

UNIT V

IMPLEMENTATION ACTIVITIES
Implementation of various types of CMM (Capability Maturity Model) ISO 9000

TEXT BOOKS :
1. Gopalaswamy Ramesh, Managing Global Software Project, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2002.
2. Roger S.Pressman, Software Engineering, A Practitioner's approach, McGraw-Hill International Edition, New Delhi, 2001.

REFERENCES :
1. Walker Royce, Software Project Management, A Unified frame work, Pearson Education Asia, New Delhi, 2000.
2. Steve McConnel, Rapid Development, WP Publishers & Distributors (P) Limited, Microsoft Press, Bangalore, 1996.
3. Bob Hughes and Mike Cofferell, Software Project Management, Tata McGraw-Hill Publishing Company Limited, New Delhi,1999.
4. Kieron Conway, Software Project Management, Coriolis Group, Dreamtech Press, New Delhi, 2000.

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (Informational Technology)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
IT	Analog and Digital Communications	IT - 4041

Unit-I
Time domain and frequency domain representation of signal, Fourier Transform and its properties, Transform of Gate, Periodic gate, Impulse periodic impulse sine and cosine wave, Concept of energy density and power density (Parseval's theorem), Power density of periodic gate and impulse function, impulse response of a system, convolutions, convolution with impulse function, causal and non causal system impulse response of ideal low pass filter, Correlation & Auto correlation.

Unit-II
Base band signal, need of modulation, Introduction of modulations techniques,Amplitude modulation, Equation and its frequency domain representation, Bandwidth, Power distribution. AM suppressed carrier waveform equation and frequency domain representation Generation (Balance/Chopper modulator) and synchronous detection technique, errors in synchronous detection, Introduction to SSB and VSB Transmission Angle modulation, Frequency and phase modulation equation and their relative phase and frequency deviations, modulation index frequency spectrum, NBFM and WBFM, Bandwidth comparison of modulation techniques.

Unit-III
Sampling of signal, sampling theorem for low pass and Band pass signal, Pulse amplitude modulation (PAM), Time division, multiplexing (TDM). Channel Bandwidth for PAM-TDM signal Type of sampling instantaneous, Natural and flat top, Aperture effect, Introduction to pulse position and pulse duration modulations, Digital signal, Quantization, Quantization error, Pulse code modulation, signal to noise ratio, Companding, Data rate and Baud rate, Bit rate, multiplexed PCM signal, Differential PCM (DPCM), Delta Modulation (DM) and Adaptive Delta Modulation (ADM), comparison of various systems.

Unit-IV
Digital modulations techniques, Generation, detection, equation and Bandwidth of amplitude shift keying (ASK) Binary Phase Shift keying (BPSK), Differential phase shift keying (DPSK), offset and non offset quadrature phase shift keying (QPSK), M-Ary PSK, Binary frequency Shift Keying (BFSK), M-Ary FSK Quadrature Amplitude modulation (QAM), MODEM, Introduction to probability of error.

Unit-V
Information theory and coding- Information, entropies (Marginal and conditional), Model of a communication system, Mathematical representation of source, channel and receiver characteristics, Mutual information, channel capacity efficiency of noise free channel Binary symmetric channel (BSC) Binary erasure channel (BEC), Repetition of signal, NM symmetric Binary channel, Shannon theorem, Shanon-Hartley theorem (S/N-BW trade off)Source encoding code properties; Shanon, Fano and Huffman coding methods and their efficiency error control coding, Minimum Hamming distance, Linear Block Code, Cyclic code and convolution codes. Line Encoding: Manchester coding, RZ, NRZ coding.

References:

1. Singh & Sapre, Communication System, TMH
2. Taub & shilling, Communication System, TMH
3. Hsu; Analog and digital communication(Schaum); TMH
4. B.P. Lathi, Modern Digital and analog communication system,
5. Simon Haykins, Communication System. John Willy
6. Wayne Tomasi, Electronic Communication system.
7. Martin S. Roden, Analog & Digital Communication System; Discovery Press.
8. Frank R. Dungan, Electronic Communication System, Thomson/Vikas.

List of Experiments(Expandable)

1. Study of sampling process and signal reconstruction and aliasing.
2. Study of PAM PPM and PDM
3. Study of PCM transmitter and receiver.
4. Time division multiplexing (TDM) and De multiplexing
5. Study of ASK PSK and FSK transmitter and receiver.
6. Study of AM modulation and Demodulation techniques (Transmitter and Receiver) Calculate of parameters
7. Study of FM modulation and demodulation (Transmitter and Receiver) & Calculation of parameters
8. To construct and verify pre emphasis and de-emphasis and plot the wave forms.
9. Study of super hetrodyne receiver and characteristics of ratio radio receiver.
10. To construct frequency multiplier circuit and to observe the waveform
11. Study of AVC and AFC.

R.K.D.F. UNIVERSITY, BHOPAL

B.E. (Information Technology)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
IT	**Computer Networks**	**IT- 4051**

UNIT I

DATA COMMUNICATIONS

Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

UNIT II

DATA LINK LAYER

Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

UNIT III

NETWORK LAYER

Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting– Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT IV

TRANSPORT LAYER

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT V

APPLICATION LAYER

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

TEXT BOOK :
1. Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw-Hill, 2004.

REFERENCES :
1. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, 2003.
2. Larry L.Peterson and Peter S. Davie, "Computer Networks", Harcourt Asia Pvt. Ltd., Second Edition.
3. Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.
4. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.
5. Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.

NETWORKING LAB
LIST OF EXPERIMENTS
All the programs are to be written using C)
1.   Simulation of ARP / RARP.
2.   Write a program that takes a binary file as input and performs bit stuffing and CRC
        Computation.
3.   Develop an application for transferring files over RS232.
4.   Simulation of Sliding-Window protocol.
5.   Simulation of BGP / OSPF routing protocol.
6.   Develop a Client – Server application for chat.
7.   Develop a Client that contacts a given DNS Server to resolve a given host name.
8.   Write a Client to download a file from a HTTP Server.
9.   Study of Network Simulators like NS2/Glomosim / OPNET

R.K.D.F. UNIVERSITY, BHOPAL
B.E. (INFORMATION TECHNOLOGY)
SECOND YEAR
Semester – IV
Course Content & Grade

Branch	Subject Title	Subject Code
IT	**Software Lab-II (Java)**	**IT- 4061**

UNIT-I
Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes

UNIT–II
Java Collective Frame Work - Data Structures: Introduction, Type-Wrapper Classes for Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Generics: Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and Iterator, Linked List, Vector.Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queue and Interface Queue, Maps, Properties Class, Un-modifiable Collections.

UNIT–III
Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

UNIT–IV
Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, Multitier Applications, Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips

UNIT–V
Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

References:
1. Deitel & Deitel, "JAVA, How to Program"; PHI, Pearson.
2. E. Balaguruswamy, "Programming In Java"; TMH Publications
3. The Complete Reference: Herbert Schildt, TMH

List of Program to be perform (Expandable)
1.   Installation of J2SDK
2.   Write a program to show Concept of CLASS in JAVA
3.   Write a program to show Type Casting in JAVA
4.   Write a program to show How Exception Handling is in JAVA
5.   Write a Program to show Inheritance
6.   Write a program to show Polymorphism