RKDF UNIVERSITY RANCHI

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

RKDF UNIVERSITY RANCHI

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE ENGINEERING

(B.TECH. CSE)

2023 ONWARDS

RKDF UNIVERSITY RANCHI

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

(Common to all Branches)

New Scheme Based on AICTE Flexible Curricula

Choice Based Credit System Semester

Semester – I

(COURSE SCHEME & MARKS DISTRIBUTION)

SL. No.	Category	SubjectCode	Subject Name	Periods			Credits	Marks Distribution				
				L	T	P		Internal	External		Total	
								Max	Max	Min	Max	Min
1	**Basic Science Course**	BT101	Engineering Chemistry	3	0	0	**3**	30	70	21	100	35
2	**Basic Science Course**	BT102	Engineering Mathematics- I	3	1	0	**4**	30	70	21	100	35
3	**Humanities andSocial Science**	BT103	Technical Communication	2	0	0	**2**	30	70	21	100	35
4	**Engineering ScienceCourse**	BT104	Basic Electrical & Electronics Engineering	3	0	0	**3**	30	70	21	100	35
5	**Engineering ScienceCourse**	BT105	Engineering Graphics& Design	2	0	0	**2**	30	70	21	100	35
6	**Humanities andSocial Science**	BT106	Universal HumanValues-2	3	0	0	**3**	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	**Basic Science Course**	BT151	Engineering Chemistry Lab	0	0	2	**1**	30	20		50	25
3	**Engineering Science Course**	BT 154	Basic Electrical & Electronics Engineering Lab	0	0	2	**1**	30	20		50	25
4	**Engineering Science Course**	BT 155	Engineering Graphics &Design Lab	0	0	2	**1**	30	20		50	25
5	**Engineering Science Course**	BT156	Workshop/ Manufacturing Practices	0	0	4	**2**	30	20		50	25
TOTAL				16	1	10	**22**					

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

R.K.D.F. UNIVERSITY, RANCHI

Department of Computer Science & Engineering(Common to allBranches)

New Scheme Based on AICTE Flexible Curricula

Semester – I Course Content

Branch	Subject Title	Subject Code
B.Tech. (Common)	Engineering Chemistry	BT101

Course Objectives:

1. To expose the student to a breadth of experimental techniques using modern instrumentation
2. The students will understand the importance of the periodic table of the elements how it came to be and it's role in organizing chemical information.
3. The student will learn the laboratory skills needed to design, safely conduct and interpret chemical research.

Module 1

Electrochemistry and Water:

Electrochemistry: Law of chemical equilibrium, equilibrium constants and their significance, Weak and strong electrolytes, Conductors, Insulators , Dielectrics, galvanic cells, Standard electrode potential and its application to different kinds of half cells, Batteries and Fuel Cells with examples, Arrhenius Theory of Ionisation, Degree of Ionisation & factors affecting degree of ionization. Ostwald's dilution law, pH, buffer. Numerical problems.

Water and corrosion : Sources, Impurities, Hardness & it's different units, Degree of Hardness, Softening of water by Zeolite and Ion exchange method, Boiler trouble causes (Sludge and Scale), Characteristics of municipal water & its treatment, Chemical and Electrochemical corrosion, Factors affecting the rate of corrosion, General method of corrosion prevention.

Module 2

Periodic Properties and Chemical Bonding:

Periodic properties: Brief introduction to Periodic table, Ionization energy, electron affinity, electro negativity, electronic configurations, atomic and ionic sizes, polarizability

Chemical Bonding: VSEPR theory, oxidation states, coordination numbers and geometries, hard soft acids and bases, Crystal field theory, color & magnetic properties of coordination complexes. Types of bonds-Ionic bond, Covalent bonds, Metallic Bonds, Hydrogen bond, etc.

Module 3

Spectroscopy and Photochemistry

Spectroscopy: Principles of spectroscopy and selection rules, Electronic spectroscopy-Absorption and emission Spectroscopy, Principles and applications of UV-Visible, Factors influencing for UV-vis spectrum; Rotational and Vibrational spectroscopy, Principle of FT-IR, and NMR spectroscopy. Modern techniques in structural elucidation of compounds by UV-Vis, IR, & NMR Spectroscopy.

Photochemistry: Photochemical reaction, Lambert-Beers Law, Fluorescence and Phosphorescence, Jablonskii diagram, Einstein photochemical reaction

Module 4

Thermochemistry and Fuels

Thermochemistry: Free energy, entropy, Enthaply, EMF. Hess's law, entropy, enthalpy and combustion calculations, Cell potentials, the Nernst equation and applications. Acid base, oxidation reduction and solubility equilibria.

Fuels: Classification of the fuel and its characteristics, Calorific value, HCV, LCV, Determination of calorific value by Bomb calorimeter, application of fossil fuels, solid fuels (coal), liquid fuels (petrol and diesel), gaseous fuels (water gas, producer gas, coal gas and biogas), carbonization and gasification, refining, reforming, , knocking and anti-knocking properties, octane and cetane number.

Module 5

Polymerization and Common Organic Reactions

Polymers: Introduction, Types, classification and properties of polymers, Different methods of synthesis- Addition, condensation. Molecular weights of polymers (M_n, M_w, M_v), glass transition temperature (Tg), synthesis of commercially important polymers and their uses(Nylon 6, Nylon 6,6, Polyethyelene, PET, PS, PVC), an introduction to green chemistry.

and, Synthesis of commercially important polymers and their uses- PVC, Teflon, Nylon 6, Nylon 66, Decoran,Vulcanization of Rubber. Organic reactions: Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclizationand ring openings with examples.

Course Outcomes:

a. Students will have a firm foundation in the fundamental and application of current chemical and scientific theories including those analytical, Inorganic, Organic, and Physical Chemistries. Major to be certified by the American chemical Society will have extensive laboratory work and knowledge of biological chem.
b. Students will be able to design and carry out scientific experiments as well as accurately record, and analyze theresults of such experiments.
c. Students will have able to explore new areas of research in both chemistry and allied fields of science andtechnology.
d. Students will able to explain why chemistry is an integral activity for addressing social, economic and environmental problems.

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Choice Based Credit System Semester

Semester – I

Course	Subject Title	Subject Code
B.Tech. (Common)	**Engineering Chemistry Lab**	**BT151**

List of Experiments:

1. Determination of Total hardness by EDTA method.
2. Determination of mixed alkalinity

- OH^- & $CO3^{2-}$
- $CO3^{2-}$ & $HCO3^-$

3. Determination of Flash & Fire Points by Pensky Marten Apparatus.
4. Determination of Flash & Fire Points by by Abel's Apparatus.
5. Determination of Flash & Fire Points by Cleveland's Open Cup Apparatus.
6. Determination of Calorific Value by Bomb Calorimeter.
7. Determination of Viscosity and Viscosity index by Redwood viscometer No.1.
8. Determination of Viscosity and Viscosity index by Redwood viscometer No.2.
9. Determination of percentage of carbon by Proximate analysis of coal
10. To Determine the Strength of NaOH Solution (Standard Oxalic Acid SolutionSupplied)
11. To Determine the Strength of HCl Solution (Standard NaOH Solution Supplied)
12. Salt analysis: Dry Test &Wet Test acid and basic radicals

Books Suggested:

1. Chemistry in Engineering and Technology - Vol.1 & 2 Kuriacose and Rajaram, McGraw Hill Education
2. Fundamental of Molecular Spectroscopy C.N. Banwell , McGraw Hill Education
3. Engineering Chemistry – B.K. Sharma, Krishna Prakashan Media (P) Ltd., Meerut.
4. Basics of Engineering Chemistry – S.S. Dara & A.K. Singh, S. Chand &Company Ltd., Delhi.
5. Applied Chemistry – Theory and Practice, O.P. Viramani, A.K. Narula, New Age International Pvt. Ltd. Publishers, New Delhi.
6. Elementary Spectroscopy ,Y .R. Sharma , S. Chand Publishing
7. Polymer Science, Vasant R. Gowariker, N. V. Viswanathan, Jayadev Sreedhar, NewAge International Pvt. Ltd
8. Advanced Inorganic Chemistry, G.R. Chatwal, Goal Publishing house
9. Engineering Chemistry (NPTEL Web-book) B.L. Tembe, Kamaluddin and M.S.Krishna
10. Engineering Chemistry Jain & Jain Dhanpat Rai and Sons

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Semester – I

Branch	Subject Title	Subject Code
B.Tech (Common)	**Engineering Mathematics-I**	**BT102**

Module 1: Calculus: Successive Differentiation, Rolle's theorem, Mean Value theorems, Expansion of functions by Mc. Laurin's and Taylor's for one variable; Taylor's theorem for function of two variables, Partial Differentiation, Maxima & Minima (two and three variables),Method of Lagranges Multipliers.

Module 2: Calculus: Definite Integral as a limit of a sum and Its application in summation of series; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolutions. Multiple Integral, Change the order of the integration, Applications of multiple integral for calculating area and volumes of the curves. **Module 3: Sequences and series:** Convergence of sequence and series, tests for convergence; Power series, Taylor's series, series for exponential, trigonometric and logarithm functions; Fourier series: Half range sine and cosine series, Parseval's theorem.

Module 4: Matrices: Rank of a Matrix, Solution of Simultaneous Linear Equations by Elementary Transformation, Consistency of Equation, Eigen Values and Eigen Vectors, Diagonalization of Matrices, Cayley-Hamilton theorem andits applications to find inverse.

Module 5: Boolean Algebra: Algebra of Logic, Boolean Algebra, Principle of Duality, Basic Theorems, Boolean Expressions and Functions. Elementary Concept of Fuzzy Logic Graph Theory: Graphs, Subgraphs, Degree and Distance, Tree, cycles and Network.

References:

1. 1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition,Pearson, Reprint, 2002.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley &Sons, 2006.
3. Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, NewDelhi, 2008.
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11thReprint, 2010.
5. D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
6. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint,2008.
7. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition ,2010.

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Choice Based Credit System Semester

Semester – I

Course Content

Branch	Subject Title	Subject Code
B.Tech (Common)	Technical Communication	BT103

Module I

Identifying Common errors in writing: Articles, Subject-Verb Agreement, Prepositions, Active and Passive Voice, Reported Speech: Direct and Indirect, Sentence Structure.

Module II

Unit-II Vocabulary building and Comprehension: Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives, synonyms, antonyms, Reading comprehension, Paragraph writing, Unseen passage.

Module III

Unit-III Communication: Introduction, Meaning and Significance, Process of Communication, Oral and Written Communication, 7 c's of Communication, Barriers to Communication and Ways to overcome them, Importance of Communication for Technical students, nonverbal communication, Types and forms of Communication, Skills of Communication.

Module IV

Unit-IV Developing Writing Skills: Planning, Drafting and Editing, Precise Writing, Précis, Technical definition and Technical description. Report Writing: Features of writing a good Report, Structure of a Formal Report, Report of Trouble, Laboratory Report, Progress Report, Note making.

Module V

Unit-V Business Correspondence: Importance of Business Letters, Parts and Layout;

Application, Contents of good Resume, guidelines for writing Resume, Calling/ Sending Quotation, Order, Complaint, E-mail and Tender.

Books Recommended:

1. 'Technical Communication : Principles and practice', Meenakshi Raman and SangeetaSharma (Oxford)
2. 'Effective Business Communication', Krizan and merrier (Cengage learning)
3. 'Communication Skill, Sanjay Kumar and Pushlata, OUP2011
4. "Practical English Usage Michael Swan OUP, 1995.
5. "Exercises in spoken English Parts I-III CIEFL, Hyderabad, Oxford University Press
6. On writing well, William Zinsser, Harper Resource Book 2001.
7. Remedial English Grammar, F.T. Wood, Macmillan 2007.

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Semester – I Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	Basic Electrical & Electronics Engineering	BT104

Course Objectives:

1. To make students familiar with basics of AC and DC Circuits and networks
2. To understand the construction and working principles of basic Transformer and Rotating machines
3. To understand the wiring system and Power distribution channel
4. To Design and analyze various electronic circuits

Module I

AC & DC CIRCUITS

Circuit parameters, Ohms law, Kirchhoff's law. Average and RMS values, concept of phasor representation. RLC series circuits and series resonance, RLC parallel circuits (includes simple problems in DC & AC circuits) Introduction to three phase systems – types of connections, relationship between line and phase values. (qualitative treatment only) Voltage and current sources, dependent and independent sources, source conversion, DC circuits analysis using mesh & nodal method, star-delta transformation. 1-phase AC circuits under sinusoidal steady state, active, reactive and apparent power, physical meaning of reactive power, power factor, 3-phase balanced and unbalanced supply, star and delta connections.

Module II TRANSFORMERS

Review of laws of electromagnetism, mmf, flux, and their relation, analysis of magnetic circuits. Single-phase transformer,

basic concepts and construction features, voltage, current and impedance transformation,

equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, OC and SC test.

Module III ROTATING ELECTRIC MACHINES

Constructional details of DC machine, induction machine and synchronous machine, Working principle of DC machines, classification of DC machine, EMF equation, armature reaction, characteristic of separately excited and self excited generator. Working principle of DC motor, Importance of back EMF, Starting of DC motor, speed torque characteristic of separately excited and self excited DC motor.

Module IV

WIRING & LIGHTING

Types of wiring, wiring accessories, staircase & corridor wiring, Working and characteristics of incandescent, fluorescent, SV & MV lamps. Basic principles of earthling, simple layout of generation, transmission & distribution of power.

Module VELECTRONICS

Binary Number system binary addition, subtraction, multiplication and division, subtraction operation using 1's and 2's complement

forms, Octal number system, hexadecimal number system conversion of number system from one number system to another number system, typesof Resistor, Inductor and capacitor, color coding of resistor and capacitor P-type and N-type semiconductor, semiconductor diode its operation in forward and reverse bias, V-1 characteristics, half wave and full wave rectification, application.

Course Outcomes:

After studying this course students will be able to

1. Design various AC and DC Circuits
2. Able to explain the various parts of electrical Machines and their functioning.
3. will be able to explain wiring and power distribution.
4. Will be able to design basic electronic circuits such as diode rectifiers etc.

References:

- Basic Electrical & Electronics Engineering by V.N. Mittle & Arvind Mittle.
- Vincent Del Toro, Electrical Engineering Fundamentals, PHI Learning, II Edition
- S.Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI, II Edition.
- Millman, Halkias & Parikh, Integrated Electronics, Mc Graw Hill, II Edition
- Nagrath & Kothari, Basic Electrical Engineering, TMH.
- J.S. Katre, Basic Electronics Engg, Max Pub. Pune.
- Hughes, Electrical and Electronic Technology, Pearson Education IX Edition

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Semester – I Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	Engineering Graphics & Design	BT105

Module – I

GEOMETRICAL CONSTRUCTION, USE OF INSTRUMENTS, SCALES: **Representative** factor, plain scales, diagonal scales, scale of chords. engineering curves; Construction of ellipse, parabola, hyperbola, Cycloid, Epi- cycloid, Hypo-cycloid, Involutes, Archimedean and logarithmic spirals.

Module II

Projections of points, lines, planes and solids. Section of Solids: Section of right solids by normal and inclined planes.

Module III

Development of Surfaces: Parallel line and radial - line method for right solids.

Isometric Projections: Isometric scale, Isometric axes, Isometric Projection from orthographic drawing. Intersection of cylinders.

Module IV

Computer Graphics: Introduction to general purpose graphics software, plotting techniques, coordinate system transformations, line drawing, polygon an circle generation. Drawing entity commands of Computer drafting. Sectional and dimensional drawing using computer.

Module V

Working in sketcher environment, Drawing sketch, line, circle, rectangle, ellipse, arc, spline etc. Deleting & trimming sketching entities, Dimensioning the sketches ,Modifying dimension of sketches, Modifying dimension of sketches, Creating text, Transformation of sketch entiies-

mirror, scale, rotate, Drawing views, Determining visible area of the view ,Creating a cross-section views, Modifying cross-section views, Editing cross-section views, Modify the

Drawing views, Dimensioning & detailing the drawing views.

Text/Reference Books:

1. Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House
2. Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education
3. Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication
4. Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Sci tech Publishers
5. (Corresponding set of) CAD Software Theory and User Manuals

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Choice Based Credit System Semester

Semester – I

Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	Universal Human value (UHV)-2	BT106

Module 1 –

Introduction to Value Education

Lecture 1: Right Understanding, Relationship and Physical Facility (Holistic Development and the Role of Education)

Lecture 2: Understanding Value Education

Lecture 3: Self-exploration as the Process for Value Education

Lecture 4: Continuous Happiness and Prosperity – the Basic Human Aspirations

Lecture 5: Happiness and Prosperity – Current Scenario

Lecture 6: Method to Fulfill the Basic Human Aspirations Practical

Tutorial 1: **Practice Session PS1** Sharing about Oneself

Tutorial 2: Practice Session PS2 Exploring Human Consciousness

Tutorial 3: Practice Session PS3 Exploring Natural Acceptance

Module 2 –

Harmony in the Human Being

Lecture 7: Understanding Human being as the Co-existence of the Self and the Body

Lecture 8: Distinguishing between the Needs of the Self and the Body

Lecture 9: The Body as an Instrument of the Self **Lecture 10:**

Understanding Harmony in the Self **Lecture 11:** Harmony of the Self with the Body

Lecture 12: Programme to ensure self-regulation and Health Practical

Tutorial 4: Practice Session PS4 Exploring the difference of Needs of Self and Body

Tutorial 5: Practice Session PS5 Exploring Sources of Imagination in the Self

Tutorial 6: Practice Session PS6 Exploring Harmonyof Self with the Body

Module 3

Harmony in the Family and Society

Lecture 13: Harmony in the Family – the Basic Unit of Human Interaction

Lecture 14: 'Trust' – the Foundational Value in Relationship

Lecture 15: 'Respect' – as the Right Evaluation **Lecture 16:** Other Feelings, Justice in Human-to-Human Relationship**Lecture 17:** Understanding Harmony in the Society **Lecture 18:** Vision for the Universal Human Order Practical **Tutorial 7: Practice Session PS7** Exploring the Feeling of Trust

Tutorial 8: Practice Session PS8 Exploring the Feeling of Respect

Tutorial 9: Practice Session PS9 Exploring Systems to fulfill Human Goal

Module 4 – Harmony in the Nature/Existence Lecture 19:

Understanding Harmony in the Nature

Lecture 20: Interconnectedness, self-regulation and Mutual Fulfillment among the Four Orders of Nature

Lecture 21: Realizing Existence as Co-existence at All Levels

Lecture 22: The Holistic Perception of Harmony in Existence Practical **Tutorial 10: Practice Session PS10** Exploring the Four Orders of Nature

Tutorial 11: Practice Session PS11 ExploringCo-existence in Existence

Module 5 – Implications of the Holistic Understanding – a Look at Professional Ethics Lecture 23: NaturalAcceptance of Human Values

Lecture 24: Definitiveness of (Ethical) Human Conduct

Lecture 25: A Basis for Humanistic Education, Humanistic Constitution and Universal Human Order

Lecture 26: Competence in Professional Ethics

Lecture 27: Holistic Technologies, Production Systems and Management Models-Typical Case Studies

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Lecture 28: Strategies for Transition towards Value-based Life and Profession Practical

Tutorial 12: Practice Session PS12 Exploring Ethical Human Conduct

Tutorial 13: Practice Session PS13 Exploring Humanistic Models in Education

Tutorial 14: Practice Session PS14 Exploring Steps of Transition towards Universal Human Order

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Choice Based Credit System Semester

Semester – I

Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	Workshop/ Manufacturing Practices	BT156

Module I

Introduction: Manufacturing Processes and its Classification, Casting, Machining, Plastic deformation and metal forming, Joining Processes, Heat treatment process, Assembly process. Powder Metallurgy, introduction to computers in manufacturing. Black Smithy Shop Use of various smithy tools. Forging operations: Upsetting, Drawing down, Fullering, Swaging, Cutting down, Forge welding, Punching and drafting. Suggested Jobs: Forging of chisel., forging of Screw Driver

Module II

Carpentry Shop: Timber : Type, Qualities of timber disease, Timber grains, Structure of timber, Timber, Timber seasoning, Timber preservation .Wood Working tools: Wood working machinery, joints & joinery. Various operations of planning using various carpentry planes sawing & marking of various carpentry joints. Suggested Jobs : Name Plate ,Any of the Carpentry joint like mortise or tennon joint

Module III

Fitting Shop: Study and use of Measuring instruments, Engineer steel rule, Surface gauges caliper, Height gauges, feeler gauges, micro meter. Different types of files, File cuts, File grades, Use of surface plate, Surface gauges drilling tapping Fitting operations: Chipping filling, Drilling and tapping. Suggested Jobs: Preparation of job piece by making use of filling,

sawing and chipping , drilling and tapping operations.

Module IV

Foundry: Pattern Making: Study of Pattern materials, pattern allowances and types of patterns. Core box and core print, .Use and care of tools used for making wooden patterns. Moulding, Properties of good mould & Core sand, Composition of Green, Dry and Loam sand. Methods used to prepare simple green and bench and pit mould dry sand bench mould using single piece and split patterns.

Module V

Welding: Study and use of tools used for Brazing, Soldering, Gas & Arc welding. Preparing Lap & Butt joints using gas and arc welding methods, Study of TIG & MIG welding processes. Safety precautions.

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Choice Based Credit System Semester

Semester – II

(COURSE SCHEME & MARKS DISTRIBUTION)

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
				L	T	P		Internal	External		Total	
								Max	Max	Min	Max	Min
1	Basic Science Course	BT201	Engineering Physics	4	0	0	4	30	70	21	100	35
2	Basic Science Course	BT202	Engineering Mathematics-II	3	1	0	4	30	70	21	100	35
3	Engineering Science Course	BT203	Basic Mechanical Engineering	2	0	0	2	30	70	21	100	35
4	Engineering Science Course	BT204	Basic Civil Engineering &Mechanics	3	0	0	3	30	70	21	100	35
5	Engineering Science Course	BT205	Programming for Problem Solving With C	2	0	0	2	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	Basic Science Course	BT251	Engineering Physics Lab	0	0	2	1	30	20		50	25
2	Engineering Science Course	BT253	Basic Mechanical Engineering Lab	0	0	2	1	30	20		50	25
3	Engineering Science Course	BT255	Programming for Problem Solving In C Lab	0	0	4	2	30	20		50	25
4	Engineering Science Course	BT254	Basic Civil Engineering &Mechanics Lab	0	0	2	1	30	20		50	25
5	Humanities and Social Science	BT256	Language Laboratory	0	0	2	1	30	20		50	25
6	Athletic Union	BT257	Sports and NSS/YOGA	0	0	2	1	30	20		50	25
TOTAL				14	1	10	22					

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Semester – II Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	Engineering Physics	BT201

Module-I

Wave Optics

Interference: Fresnel's biprism, Interference in thin films, Newton's rings and Michelson's interferometer experiments. Diffraction at single slit, double slit and n-slit. Diffraction grating. Rayleigh criterion, resolving power of a telescope, grating and prism. Concept of polarized light, Brewster's laws, Double refraction, Nicol prism, quarter & half wave plate. Idea about circularly & elliptically polarized light.

Module-II

Nuclear Physics

Nuclear Structure & Nuclear properties, Quantitative treatment of nuclear models: liquid drop and shell models, Linear Particle accelerator, Cyclotron, Synchrotron, Synchrocyclotron, and Betatron, Nuclear cross section, chain reaction, critical size. Application of $E = mc^2$,Q-Value, Nuclear fusion & fission, Nuclear reactors, Geiger- Muller Counter, Bainbridge and Auston mass Spectrograph.

Module-III

Semiconductors & Nano-Physics

Free Electron model of solids, Qualitative Analysis of Kronig Penny model ,Effective mass, Fermi level for Intrinsic and Extrinsic Semiconductors: p-n junctions, Zener break down, photodiode, solar-cells, Hall effect. Elementary idea about Nano structures and Nano materials.

Module-IV

Laser and Fiber Optics

Laser: Stimulated and spontaneous emission, Einstein's A & B Coefficients, transition probabilities, active medium, population inversion, pumping, Optical resonators, characteristic of laser beam. Coherence, directionality and divergence. Principles and working of Ruby, Nd: YAG, He-Ne & Carbon dioxide Lasers with energy level diagram.. Fundamental idea about optical fiber, types of fibers, acceptance angle & cone, numerical aperture, V-number, propagation of light through step index fiber (Ray theory) pulse dispersion, attenuation, losses & various uses. Engineering uses & applications of laser and Optical Fiber

Module-V

Quantum Physics

Origin of Quantum hypothesis, DeBroglie's hypothesis of matter wave & its experimental verification. Group and particle velocities & their relations. Uncertainty principle with elementary proof & its application to Electron microscope, Compton effect. Wave function and its physical significance, general idea and application of time dependent and time independent Schrodinger wave equation.

List of suggestive core experiments: -

1. Biprism, Newton's Rings, Michelsons Interferometer.
2. Resolving Powers –Telescope, Microscope, and Grating.
3. G.M. Counter
4. Spectrometers-R.I., Wavelength, using prism and grating
5. Optical polarization based experiments: Brewster's angle, polarimeter etc.
6. Measurements by LASER-Directionality, Numerical aperture, Distance etc.
7. Uses of Potentiometers and Bridges (Electrical)..
8. Experiments connected with diodes and transistor.
9. Measurement of energy band gap of semiconductor.
10. Other conceptual experiments related to theory syllabus.

Reference Books: -

1. Engineering Physics- V. S. Yadava, TMH
2. A T.B. of Optics by Brijlal and Subhraininyan.
3. Optics By Ghatak, TMH
4. Engineering physics by M.N. Avadhanulu and P.G. Kshirsagar. S. Chand & Co.
5. Fundamentals of engineering physics by P. Swarup, Laxmi Publications.
6. Atomic and Nuclear physics by Brijlal and Subraminiyan

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Department of Computer Science & Engineering(Common to all Branches)

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Choice Based Credit System Semester

Semester – II

Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	Engineering Mathematics-II	BT202

Module 1: Ordinary Differential Equations I : Differential Equations of First Order and First Degree (Leibnitz linear, Bernoulli's, Exact), Differential Equations of First Order and Higher Degree, Higher order differential equations with constants coefficients, Homogeneous Linear Differential equations, Simultaneous Differential Equations.

Module 2: Ordinary differential Equations II: Second order linear differential equations with variable coefficients, Method of variation of parameters, Power series solutions; Legendre polynomials, Bessel functions of the first kind and their properties.

Module 3: Partial Differential Equations: Formulation of Partial Differential equations, Linear and Non-Linear Partial Differential Equations, Homogeneous Linear Partial Differential Equations with Constants Coefficients.

Module 4: Vector Calculus: Differentiation of Vectors, Scalar and vector point function, Gradient, Geometrical meaning of gradient, Directional Derivative, Divergence and Curl, Line Integral, Surface Integral and Volume Integral, Gauss Divergence, Stokes and Green theorems.

Module 5: Functions of Complex Variable: Functions of Complex Variables: Analytic Functions, Harmonic Conjugate, Cauchy-Riemann Equations (without proof), Line Integral, Cauchy-Goursat theorem (without proof), Cauchy Integral formula (without proof), Singular Points, Poles & Residues, Residue Theorem, Application of Residues theorem for Evaluation of Real Integral (Unit Circle).

Textbooks/References:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons,2006.
3. W. E. Boyce and R. C. DiPrima, Elementary Differential Equations and Boundary Value
4.
5. Problems, 9th Edn., Wiley India, 2009.
6. S. L. Ross, Differential Equations, 3rd Ed., Wiley India, 1984.
7. E. A. Coddington, An Introduction to Ordinary Differential Equations, Prentice Hall India, 1995.
8. E. L. Ince, Ordinary Differential Equations, Dover Publications, 1958.
9. J. W. Brown and R. V. Churchill, Complex Variables and Applications, 7th Ed., McGrawHill, 2004.
10. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint,2008.
11. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 36th Edition, 2010.

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Semester – II

Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	Basic Mechanical Engineering	BT203

Module-I:

Materials: Classification of engineering material, Composition of Cast iron and Carbon steels, Iron Carbon diagram. Alloy steels their applications. Mechanical properties like strength, hardness, toughness , ductility, brittleness , malleability etc. of materials , Tensile test- Stress-strain diagram of ductile and brittle materials, Hooks law and modulus of elasticity, Hardness and Impact testing of materials, BHN etc.

Module-II:

Measurement: Concept of measurements, errors in measurement, Temperature, Pressure, Velocity, Flow strain, Force and torque measurement, Vernier caliper, Micrometer, Dial gauge, Slip gauge, Sine-bar and Combination set.

Production Engineering: Elementary theoretical aspects of production processes like casting, carpentry, welding etc Introduction to Lathe and Drilling machines and their various operations.

Module-III:

Fluids: Fluid properties pressure, density and viscosity etc. Types of fluids , Newton's law of viscosity , Pascal's law , Bernoulli's equation for incompressible fluids, Only working principle of Hydraulic machines, pumps, turbines, Reciprocating pumps .

Module-IV:

Thermodynamics: Thermodynamic system, properties, state, process, Zeroth, First and second law of thermodynamics, thermodynamic processes at constant pressure, volume, enthalpy & entropy.

Steam Engineering: Classification and working of boilers, mountings and accessories of

boilers, Efficiency and performance analysis, natural and artificial draught**,** steam properties, use of steam tables.

Module-V:

Reciprocating Machines:

Working principle of steam Engine, Carnot, Otto, Diesel and Dual cycles P-V & T-S diagrams and its efficiency, working of two stroke & Four stroke Petrol & Diesel engines. Working principle of compressor.

Reference Books:

1- Kothandaraman & Rudramoorthy, Fluid Mechanics & Machinery, New Age.
2- Nakra & Chaudhary, Instrumentation and Measurements, TMH.
3- Nag P.K, Engineering Thermodynamics, TMH .4- Ganesan, Internal Combustion Engines, TMH.
4- Agrawal C M, Basic Mechanical Engineering, Wiley Publication.
5- Achuthan M , Engineering Thermodynamics, PHI.

List of Suggestive Core Experiments:

Theory related Eight to Ten experiments including core experiments as follows:-

1- Study of Universal Testing machines.
2- Linear and Angular measurement using, Micrometer, Slip Gauges, Dial Gauge and Sine-bar.
3- Study of Lathe Machine.
4- Study of Drilling Machines.
5- Verification of Bernoulli's Theorem.
6- Study of various types of Boilers.
7- Study of different IC Engines.
8- Study of different types of Boiler Mountings and accessories.

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Semester – II

Course Content

Branch	Subject Title	SubjectCode
B.Tech. Common	Basic Civil Engineering & Engineering Mechanics	BT204

Module-I

Building Materials & Construction

Stones, bricks, cement, lime, timber-types, properties, test & uses, laboratory tests concrete and mortar Materials: Workability, Strength properties of Concrete, Nominal proportion of Concrete preparation of concrete, compaction, curing, Low cost housing building materials. Elements of Building Construction, Foundations conventional spread footings, RCC footings, brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases –types and their suitability

Module-II

Surveying & Positioning:

Introduction to surveying Instruments – levels, thedolites, plane tables and related devices. Electronic surveying instruments etc. Measurement of distances – conventional and EDM methods, measurement of directions by different methods, measurement of elevations by Different methods and different methods of leveling.

Module-IIIMapping & Sensing:

Mapping details and contouring, Profile Cross sectioning and measurement of areas, volumes, application of measurements in quantity computations, Survey stations, Introduction of remote sensing, GIS and GPS and its applications.

Engineering Mechanics

Module-IV

Forces and Equilibrium: Graphical and Analytical Treatment of Concurrent and nonconcurring Co- planner forces, free Diagram, Force Diagram and Bow's notations, Application of Equilibrium Concepts: Analysis of plane Trusses: Method of joints, Method of Sections. Frictional force in equilibrium problems.

Module-V

Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia ofArea and Mass, Radius of Gyration, Introduction to product of Inertia and Principle Axes.

Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supported beam with concentrated,distributed load and Couple.

Reference Books:

1. S. Ramamrutam & R. Narayanan; Basic Civil Engineering, Dhanpat Rai Pub.
2. Prasad I.B., Applied Mechanics, Khanna Publication.
3. Punmia, B.C., Surveying, Standard book depot.
4. Shesha Prakash and Mogaveer; Elements of Civil Engg & Engg. Mechanics; PHI
5. S.P, Timoshenko, Mechanics of stricture, East West press Pvt.Ltd.
6. Surveying by Duggal – Tata McGraw Hill New Delhi.
7. Introduction to GIS by Chang
8. Surveying and Leveling by N.M. Basak, McGraw Hill

List of suggestive core Experiments:

Students are expected to perform minimum ten experiments from the list suggested below by preferably selectingexperiments from each unit of syllabus.

S. No.	Title
1.	To perform traverse surveying with prismatic compass, check for local attraction and determine corrected bearingsand to balance the traverse by Bowditch's rule.
2.	To perform leveling exercise by height of instrument of Rise and fall method.
3.	To measure horizontal and vertical angles in the field by using Theodolite.
4.	To determine (a) normal consistency (b) Initial and Final Setting time of a cement Sample.

5. To determine the workability of fresh concrete of given proportions by slump test or compaction factor test.
6. To determine the Compressive Strength of brick.
7. To determine particle size distribution and fineness modulus of course and fine Aggregate.
8. To verify the law of Triangle of forces and Lami's theorem.

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Semester – II

Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	Programming for Problem Solving With C	BT205

Course objectives:

1. Design solutions to simple engineering problem by applying the basic programming principles of C language and basic mathematical knowledge.
2. Choose a suitable C-construct to develop C code for a given problem.
3. Recognize the bugs in the C program.
4. Apply the C-language syntax rules to correct the bugs in the C program.
5. Develop simple C programs to illustrate the applications of different data types such as arrays, pointers.

Module-I

INTRODUCTION OF COMPUTERS: Computer System, System Characteristics and capabilities, Types of Computers: Analog, Digital (Micro, Mini, Mainframe & Super Computers), Generation of Computers.

COMPUTER ORGANISATION: Block Diagram of Computer and its functional units.

Module-II

INPUT DEVICES: Key Board, Scanner, Mouse, Light Pen, Bar Code Reader, OMR, OCR, MICR., Track ball, Joystick, Touch Screen etc. **OUTPUT DEVICES:** Monitors – Classification of Monitors based on Technology (CRT Monitor & Flat panel LCD Monitor), Printers – Dot Matrix Printer, Ink Jet Printer, Laser Printer and Plotters, Types of Plotters – Drum Plotter and Flat Bed Plotters, LCD Projectors.

STORAGE DEVICES: Magnetic tapes, Floppy Disks, Hard Disks, Compact Disc – CD-

ROM, CD-RW, VCD,DVD, DVD-RW.

PROGRAMMING LANGUAGES: History, Classifications – Low Level, Assembly & High Level languages, Advantages & Disadvantages Programming Languages.

Module-III

INTRODUCTION TO PROGRAMMING: Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/ Pseudo code with examples.

From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code.

Module-IV

Arithmetic expressions and precedence, Conditional Branching and Loops, Writing and evaluation of conditionals and consequent branching, Iteration and loops.

PROGRAM PLANNING: Purpose of Program Planning, Steps in Program Development,

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Module-V

TYPES OF SOFTWARE: System Software – Translators (Compilers, Interpreters, Assemblers), Operating System, Linkers, Libraries & Utilities, Application Software – Packaged & Tailored Software.

OPERATING SYSTEMS: Introduction, Types of O.S. – Single User, Multi User – Multi Programming, Multi-Tasking, Real Time, Time Sharing, Batch Processing, Parallel Processing, Distributed Processing.

TEXT BOOK:

1. COMPUTER FUNDAMENTALS BY *P.K. SINHA*
2. OPERATING SYSTEM BY *Peterson*
3. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
4. E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill

Reference Books:

1. EASY APPROACH TO COMPUTER COURSE BY *G.K. IYER*
2. COMPUTER TODAY BY *S.K. BASANDRA*
3. OPERATING SYSTEM BY *Godbole*
4. 'O' LEVEL PROGRAMMING CONCEPTS & SYSTEMS BY *V.K. JAIN*
5. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

Course outcomes:

After the completion of this course, students will be able to:

1. Illustrate and explain the basic computer concepts and programming principles of C language.
2. Develop C programs to solve simple mathematical and decision making problems.
3. Develop C programs to solve simple engineering problems using looping constructs.
4. Develop C programs to demonstrate the applications of derived data types such as arrays, pointers, strings and functions.

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Semester – II

Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	**Language Laboratory**	**BT206**

Communicative Language Laboratory: Course objective: The language laboratory focuses on the practice of English through audio-visual aids and Computer software. It intends to enable the students to speak English correctly with confidence and intends to help them to overcome their inhibitions and self – consciousness while speaking in English.

Topics to be covered in the Language laboratory sessions:

1. Listening Comprehension
2. Pronunciation, Intonation, Rhythm
3. Practicing everyday dialogues in English
4. Interviews
5. Formal Presentation
6. Public Speaking and oral skills with emphasis on conversational practice, extempore speech, JAM (Just a minute sessions), describing objects and situations, giving directions, debate, telephonic etiquette.

Suggested Readings:

(i) Practical English Usage. Michael Swan. OUP. 1995.

(ii) Remedial English Grammar. F.T. Wood. Macmillan.2007

(iii) On Writing Well. William Zinsser. Harper Resource Book. 2001

(iv) Study Writing. Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.

(v) Communication Skills. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.

(vi) Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

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Semester – II

Course Content

Branch	Subject Title	Subject Code
B.Tech. Common	**Sports and Yoga /NSS**	**BT257**

Course Objective(s):

- To make the students understand the importance of sound health and fitness principles as they relate to better health.
- To expose the students to a variety of physical and yogic activities aimed at stimulating their continued inquiry about Yoga, physical education, health and fitness.
- To create a safe, progressive, methodical and efficient activity based plan to enhance improvement and minimize riskof injury.
- To develop among students an appreciation of physical activity as a lifetime pursuit and a means to better health.

Course Contents:

Module I: Introduction to Physical Education

- Meaning & definition of Physical Education
- Aims & Objectives of Physical Education
- Changing trends in Physical Education

Module II: Olympic Movement

- Ancient & Modern Olympics (Summer & Winter)
- Olympic Symbols, Ideals, Objectives & Values
- Awards and Honours in the field of Sports in India (Dronacharya Award, Arjuna Award, Dhayanchand Award,Rajiv Gandhi Khel Ratna Award etc.)

Module III: Physical Fitness, Wellness & Lifestyle

- Meaning & Importance of Physical Fitness & Wellness
- Components of Physical fitness
- Components of Health related fitness
- Components of wellness
- Preventing Health Threats through Lifestyle Change
- Concept of Positive Lifestyle

Module IV: Fundamentals of Anatomy & Physiology in Physical Education, Sports and Yoga

- Define Anatomy, Physiology & Its Importance
- Effect of exercise on the functioning of Various Body Systems. (Circulatory System, Respiratory System, Neuro-Muscular System etc.)

Module V: Kinesiology, Biomechanics & Sports

- Meaning & Importance of Kinesiology & Biomechanics in Physical Edu. & Sports
- Newton's Law of Motion & its application in sports.
- Friction and its effects in Sports.

Practical

1. To practice Physical activities and Hatha Yoga focusing on yoga for strength, flexibility, and relaxation.
2. To learn techniques for increasing concentration and decreasing anxiety which leads to stronger academic performance.
3. To learn breathing exercises and healthy fitness activities
4. To understand basic skills associated with yoga and physical activities including strength and flexibility, balance and coordination.
5. To perform yoga movements in various combination and forms.
6. To assess current personal fitness levels.
7. To identify opport Moduleies for participation in yoga and sports activities.
8. To develop understanding of health-related fitness components: cardiorespiratory endurance, flexibility and body composition etc.
9. To improve personal fitness through participation in sports and yogic activities.
10. To develop understanding of psychological problems associated with the age and lifestyle.

11. To demonstrate an understanding of sound nutritional practices as related to health and physical performance.
12. To assess yoga activities in terms of fitness value.
13. To identify and apply injury prevention principles related to yoga and physical fitness activities.

Text Books/ References:

1. Modern Trends and Physical Education by Prof. Ajmer Singh.
2. Light on Yoga by B.K.S. Iyengar.
3. Health and Physical Education – NCERT (11th and 12th Classes)

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Semester – III

(COURSE SCHEME & MARKS DISTRIBUTION)

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	**Basic Science Course**	BT301	Engineering Mathematics – III	4	0	0	**4**	30	70	21	100	35
2	**Professional CoreCourse**	PCCCSE302	Data Structure andAlgorithm	3	0	0	**3**	30	70	21	100	35
3	**Professional CoreCourse**	PCCCSE303	Operating System	3	0	0	**3**	30	70	21	100	35
4	**Professional CoreCourse**	PCCCSE304	Computer Architecture& Organization	3	1	0	**4**	30	70	21	100	35
5	**Engineering Science Course**	ESC301	Object Oriented Programming with C++	2	0	0	**2**	30	70	21	100	35
6	**Basic ScienceCourse**	BT306	Environmental Science	2	0	0	**2**	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	**Professional CoreCourse**	PCCCSE353	Data Structure Lab	0	0	2	**1**	30	20	10	50	25
2	**Professional CoreCourse**	PCCCSE354	Operating System Lab	0	0	2	**1**	30	20	10	50	25
3	**Engineering Science Course**	ESC351	Object Oriented Programming with C++Lab	0	0	2	**1**	30	20	10	50	25
4	**Extra Activity**	BT357	Extra Activities NSO/NSS/NCC/YogaCreative Art /Mini Project	0	0	2	**1**	30	20	10	50	25
TOTAL							**22**					

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Semester – II

Course Content

Branch	Subject Title	Subject Code
B.Tech. ME	**Engineering Mathematics-III**	**BT- 301**

Course Objective:

i) To develop logical understanding of the subject.

ii) To develop mathematical skill so that students are able to apply mathematical methods & principals in solving problem fromengineering fields.

iii) To make aware students about the importance and symbiosis between Mathematics and Engineering.

Module-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.

Module-II

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

Module-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.

Module-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).

Module-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 Publication
(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

Learning Outcome:

At the end of this course, the students will be able:

1. to visualize and conceptualize the engineering problems.
2. to model the engineering problem mathematically using theory of calculus and matrices.
3. to determine the solution of the studied engineering problem from application point of view.

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Semester – III

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Data Structure and Algorithm	PCCCSE302

COURSE OBJECTIVES:

1. To impart the basic concepts of data structures and algorithms
2. To understand concepts about searching and sorting techniques
3. To Understand basic concepts about stacks, queues, lists, trees and graphs
4. To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures

UNIT- I

Introduction: to Notions of data type, abstract data type, and data structures. Relation to the notion of classes and objects in object oriented programming. Importance of algorithms and data structures in programming. Notion ofComplexity covering time complexity and space complexity. Worst case complexity, Average case complexity. Big Oh Notation.Examples of simple algorithms and illustration of their complexity. Introduction to recurrence relations. Iteration and Recursion-Problem solving using iteration and recursion with examples such as binary search, Fibonacci numbers, and Hanoi towers.Tradeoffs between iteration and recursion.

UNIT- II

List ADT. Implementation of lists using arrays and pointers. Stack ADT. Queue ADT. Implementation of stacks and queues. Dictionaries, Hash tables: open tables and closed tables. Analysis of hashing. Skip lists and analysis.

UNIT- III

Binary Trees- Definition and traversals: preorder, postorder, inorder. Common types and properties

of binary trees. Counting of binary trees. Huffman coding using binary trees. Binary search trees : worst case analysis and average case analysis. AVL trees. Red-Black Trees, Splay trees. Priority Queues-Binary heaps: insert and delete min operations and analysis. Binomial queues.

UNIT- IV

Directed Graphs- Data structures for graph representation. Shortest path algorithms: Dijkstra (greedy algorithm) and Bellman-Ford (dynamic programming). Depth- first search and Breadth-first search. Directed acyclic graphs. Undirected Graphs- Depth-first search and breadth-first search. Minimal spanning trees and algorithms (Floyd and Kruskal) and implementation. Application to the travelling salesman problem

UNIT- V

Sorting- Bubblesort, selection sort, insertion sort, Shell sort; Quicksort; Heapsort; Mergesort; Radix sort; Analysis of the sorting methods. Selecting the top k elements. Lower bound on sorting.

Text Books:

1. Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman and John E. Hopcroft , Addison- Wesley Series(1983)
2. Data Structures and Algorithm Analysis in Java (3rd Edition) by Mark Allen Weiss, Addison Wesley,(2011).

Reference Books:

1. T.H. Cormen, C.E. Leiserson, and R.L. Rivest. *Introduction to Algorithms.*
2. The MIT Press and McGraw-Hill Book Company, Cambridge, Massacusetts, 1990 (Available in Indian Edition).
3. Steven S. Skiena. *The Algorithm Design Manual*. Springer, Second Edition, 2008.

COURSE OUTCOMES:

1. Ability to analyze algorithms and algorithm correctness.
2. Ability to summarize searching and sorting techniques
3. Ability to describe stack, queue and linked list operation. 4 Ability to have knowledge of tree and graphs concepts.

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Semester – III

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Operating System	PCCCSE303

Learning Objectives:

Students will learn how Operating System is Important for Computer System.

1. To make aware of different types of Operating System and their services.
2. To learn different process scheduling algorithms and synchronization techniques to achieve better performance of a computer system.
3. To know virtual memory concepts.
4. To learn secondary memory management.

UNIT I

INTRODUCTION

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection - System Components – Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter- process Communication.

UNIT II

SCHEDULING

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria– Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical- Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization– Critical regions – Monitors.

UNIT III

DEADLOCKS

System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention– Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management– Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV

PAGING AND FILE SYSTEM

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames– Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing –Protection

UNIT V

FILE MANAGEMENT

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free- space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management –Swap-Space Management. Case Study: The Linux System, Windows

TEXT BOOK:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.

REFERENCES:

1. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall of India Pvt. Ltd, 2003.
3. William Stallings, “Operating System”, Prentice Hall of India, 4th Edition, 2003.
4. Pramod Chandra P.Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.

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COURSE OUTCOMES:

1. Identify the role of Operating System. To understand the design of control unit.
2. Understanding CPU Scheduling, Synchronization, Deadlock Handling and Comparing CPU Scheduling Algorithms. Solve Deadlock Detection Problems.
3. Describe the role of paging, segmentation and virtual memory in operating systems.
4. Description of protection and security and also the Comparison of UNIX and Windows based OS.
5. Defining I/O systems, Device Management Policies and Secondary Storage Structure and Evaluation of various Disk Scheduling.

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Semester – III

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Computer Architecture & Organization	PCCCSE304

Objectives of Computer Architecture & Organization

The objectives of Computer Architecture & Organization are:

1. To know the background of internal communication of computer
2. To have better idea on how to write assemble language programs
3. To be clear with memory management techniques
4. To better with IO devices communication with processor 5 To notice how to perform computer arithmetic operations

UNIT I

Basic Structure of Computers

Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II

Arithmetic Unit

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III

Basic Processing Unit

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

UNIT IV

Memory System

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

UNIT V

I/O Organization

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/OInterfaces (PCI, SCSI, USB).

TEXT BOOK:

- Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition "Computer Organization",

REFERENCES:

1. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education, 2003.
2. David A. Patterson and John L. Hennessy, "Computer Organization and Design: The hardware/ software interface", 2nd Edition, Morgan Kaufmann, 2002.

John P. Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw

Learning Outcomes:

Understands the different services provided by Operating System at different level.

- **They learn real life applications of Operating System in every field.**
- **Understands the use of different process scheduling algorithm and synchronization**

techniques to avoid deadlock. They will learn different memory management techniques like paging, segmentation and demand paging etc.

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – III Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Object Oriented Programming with C++	ESC301

COURSE OBJECTIVES

1. Introduce the student to the concepts of C++ in computer science.
2. Acquire knowledge to make functions , Files etc.

COURSE CONTENT

Module-I

Introduction to C++ and Object oriented Concepts C++ Standard Library, Basics of a Typical C++ Environment, Pre- processors Directives, and illustrative Simple C++ Programs. Header Files and Namespaces, library files. Introduction to Objects and Object Oriented Programming, Encapsulation (Information Hiding), Access Modifiers: Controlling access to a class, method, or variable (public, protected, private, package), Other Modifiers, Polymorphism: Overloading, Inheritance, Overriding Methods, Abstract Classes, Reusability, Class's Behaviors.

Module-II Classes and Data Abstraction:

Introduction, Structure Definitions, Accessing Members of Structures, Class Scope and accessing Class Members, Separating Interface from Implementation, Controlling Access Function And Utility Functions, Initializing Class Objects: Constructors, Using Default Arguments With Constructors, Using Destructors, Classes : Const (Constant) Object And Const Member Functions, Object as Member of Classes, Friend Function and Friend Classes, Using This Pointer, Dynamic Memory Allocation with New and Delete, Static Class Members, Container Classes And Integrators, Proxy Classes, Function overloading.

Module-III

Operator Overloading, Inheritance, and Virtual Functions and Polymorphism: Fundamentals of Operator Overloading, Restrictions On Operators Overloading, Operator Functions as Class Members vs. as Friend Functions, Overloading, <<, >> Overloading Unary Operators, Overloading Binary Operators. Introduction to Inheritance, Base Classes And Derived Classes, Protected Members, Casting Base- Class Pointers to Derived- Class Pointers, Using Member Functions, Overriding Base – Class Members in a Derived Class, Public, Protected and Private Inheritance, Using Constructors and Destructors in derived Classes, Implicit Derived –Class Object To Base-Class Object Conversion, Composition Vs. Inheritance. Introduction to Virtual Functions, Abstract Base Classes And Concrete Classes, Polymorphism, New Classes And Dynamic Binding, Virtual Destructors, Polymorphism, Dynamic Binding.

Module-IV

Files and I/O Streams and Templates and Exception Handling:

Files and Streams, Creating a Sequential Access File, Reading Data From A Sequential Access File, Updating Sequential Access Files, Random Access Files, Creating A Random Access File, Writing Data Randomly To a Random Access File, Reading Data Sequentially from a Random Access File. Stream Input/ Output Classes and Objects, Stream Output, Stream Input, Unformatted I/O (with read and write), Stream Manipulators, Stream Format States, Stream Error States.

Function Templates, Overloading Template Functions, Class Template, Class Templates and Non-Type Parameters, Templates and Inheritance, Templates and Friends, Templates and Static Members. Introduction, Basics of C++ Exception Handling: Try Throw, Catch, Throwing an Exception, Catching an Exception, Rethrowing an Exception, Exception specifications, Processing Unexpected Exceptions, Stack Unwinding, Constructors, Destructors and Exception Handling, Exceptions and Inheritance.

TEXT BOOKS:

1. C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall
2. Object Oriented Programming in Turbo C++ by Robert Lafore, 1994, The WAITE Group Press.3.Programming with C++ By D Ravichandran, 2003, T.M.H

REFERENCE BOOKS:

1. Object oriented Programming with C++ by E Balagurusamy, 2001, Tata McGraw-Hill.
2. Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,
3. The Complete Reference in C++ By Herbert Schildt, 2002, TMH

COURSE OUTCOMES

1. Knowledge of programming language.
2. Be aware about OOP's concept.
3. Basic understanding on programming.

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New Scheme Based on AICTE Flexible Curricula

Semester – II

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Environmental Science	BT306

Course Objective:

Understand and evaluate the global scale of environmental problems; and. Reflect critically on their roles, responsibilities, and identities as citizens, consumers and environmental actors in a complex, interconnected world**.**

Module-I

Introduction to environmental studies and Ecosystems

Multidisciplinary nature of environmental studies; Scope and importance; Concept of sustainability and sustainable development, ecosystem, Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession, Case studies of the following ecosystems: Forest ecosystem, Grassland ecosystem ,Desert ecosystem Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

Module-II

Natural Resources: Renewable and Non-renewable Resources

Land resources and land use change; Land degradation, soil erosion and desertification, Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations, Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state), Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

Module-III

Biodiversity and Conservation & Environmental Pollution

Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots, India as a mega-biodiversity nation; Endangered and endemic species of India, Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation , Environmental pollution: types, causes, effects and controls; Air, water, soil and noise pollution ,Nuclear hazards and human health risks, Solid waste management: Control measures.

Module-IV

Environmental Policies- Practices and Human communities

Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture, Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD), Human population growth: Impacts on environment, human health and welfare, Resettlement and rehabilitation of project affected persons; case studies, Disaster management: floods, earthquake, cyclones and landslides. Case studies (e.g., factory pollution in Ranchi)

Learning Outcomes:

After completing the major in Environmental Studies, students will be able to:

- Articulate the interconnected and interdisciplinary nature of environmental studies;
- Demonstrate an integrative approach to environmental issues with a focus on sustainability;
- Use critical thinking, problem-solving, and the methodological approaches of the social sciences, natural sciences, and humanities in environmental problem solving;

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New Scheme Based on AICTE Flexible Curricula
Semester – III Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Data Structure Lab	PCCCSE353

COURSE OBJECTIVES:

1. To impart the basic concepts of data structures and algorithms 2 To understand concepts about searching and sorting techniques.
2. To Understand basic concepts about stacks, queues, lists, trees and graphs.
3. To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures

List of Experiments

1. To display fibounacci series up to a range.
2. To demonstrate the concept of one dimensional array finding the sum of array elements
3. To insert an element in an array.
4. To delete an element from an array
5. To add two matrix A and B.
6. To multiply two matrix A and B.
7. To Concatenate two string
8. To copy a string into another string.
9. Implementation of linked list using array.
10. Implementation of stack using array.
11. To Create Fibonacci series using recursive function
12. Calculate factorial of a number using recursive function.
13. Implementation of queue using array.

14. Implementation of circular queue using array.
15. Implementation of binary search tree using array.
16. To Search an element using sequential search.
17. To Search an element using binary search.
18. Arrange the list of numbers in ascending order using Bubble Sort.
19. Arrange the list of numbers in ascending order using Insertion Sort.
20. Arrange the list of numbers in ascending order using Selection Sort.
21. Arrange the list of numbers in ascending order using Merge Sort
22. Arrange the list of numbers in ascending order using Quick Sort.
23. Arrange the list of numbers in ascending order using Heap Sort.

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Semester – III

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Operating System Lab	PCCCSE354

List of Experiment

1. Write a program to implement FCFS CPU scheduling algorithm.
2. Write a program to implement SJF CPU scheduling algorithm.
3. Write a program to implement Priority CPU Scheduling algorithm.
4. Write a program to implement Round Robin CPU scheduling algorithm.
5. Write a program to compare various CPU Scheduling Algorithms over different Scheduling Criteria.
6. Write a program to implement classical inter process communication problem.
7. Write a program to implement classical inter process communication problem.
8. Write a program to implement classical inter process communication problem.
9. Write a program to implement & Compare various page replacement algorithms.
10. Write a program to implement & Compare various Disk & Drum scheduling Algorithms.
11. Write a program to implement Banker's algorithms.
12. Write a program to implement Remote Procedure Call (RPC).
13. Write a Devices Drivers for any Device or peripheral.

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Semester – III

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Object Oriented Programming with C++ Lab	ESC351

Course Objectives:

- Programming basics and the fundamentals of C++
- Data types in C++
- Mathematical and logical operations
- Using if statement and loops
- Arranging data in arrays
- Implementing pointers
- File management and dynamic memory allocation

SYLLABUS

List of Programs as Assignments:

1. Write an interactive program that will read in a +ve integer value and determine the following

i) If the integer is a prime number ii) If the integer is a Fibonaccinumber

2. WAP to compute sinx = x – x^3/3! + x^5/3! – x^7/7! ….. Continue adding successive terms in the series until the value of the next term becomes smaller (in magnitude) than 10^{-5}. Test the program for x = 1, x

= 2, and x = 3. In each case display the number of terms used to obtain the final answer.

3. WAP to generate every 3rd integer beginning with I = 2 and continue for all integers that are less than

150. Calculate the sum of those integers that are evenly divisible by 5.

4. WAP to find whether a given year is a leap year or not. Modify it to generate a list of leap years between two year limits given by user.

5. WAP to display the following pattern:

```
                    11
                11  10  11
            11  10  9   10  11
        11  10  9   8   9   10  11
```

6. Using Ternary / Conditional operator find the greatest among 3 numbers.

7. WAP to convert a decimal number into an equivalent number of the input base. Test your program for base 2,8,10 & 16.

8. WAP to read a number n, and print it out digit-by-digit, as a series of words. For e.g. 123 would be printed as "one two three".

9. WAP to check whether any input +ve integer is palindrome or not.

10. WAP to simulate a simple calculator (+ - / * %) that takes twooperands and an operator as input and displays the result.

11. WAP to find the GCD of two input +ve integer numbers.

12. WAP to swap the values of two variables without using a third variable.

13. Read a line of mixed text, and then write it out with all lower case and uppercase letters reversed, all digits replaced by 0s and all other characters (non-letters and non- digits) replaced by '*'.

14. WAP to find the product of two matrices A and B. Display the source matrices and product matrix C in matrix format.

15. WAP to find whether a given matrix is a triangular matrix or not.

16. WAP to find the transpose of a matrix. Display the source and thetransposed matrix in matrix format.

17. Implement Prob. No. – 14 to 16 using functions for reading, manipulating and displaying the corresponding matrices in matrixform.

18. WAP to sort a list of strings alphabetically using a 2-dim. Character array.

19. WAP to display the row sum and the column – sum of an input 2- dim. Matrix. Display the source matrix with row and column sum.

20. Write a recursive function to calculate S = 2 + 4 + 6 + 8 + …… +2N. Implement the function in a complete C program.

21. Write a function that accepts two arguments an array and its size n. It performs Bubble up sort on the array elements. Using indirection operator '*' implement this in a complete C program. Display the source and the sorted array.

22. Using pointer, write a function that receives a character string and a character as argument. Delete all occurrences of this character in the string. The function should return corrected string with no holes.

23. Write a function for reading character string using pointer. Calculatethe length of the string (without using strlen ()). Finally print the stringin reverse order, using pointer.

24. Implement prob. No. 14 using pointers representation of 2 – dim. array.

25. Implement prob. No. 15 using pointer representation of 2 dim. array.

26. Implement prob. No. 16 using pointer representation of 2 dim. array.

27. WAP to sort a list of strings into alphabetical order using array of pointers.

28. Create records of 60 students, where each record has fields-name, roll,

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Semester – III

Courses Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Extra Activities NSO/NSS/NCC/ YogaCreative Art /Mini Project	BT357

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Choice Based Credit System Semester

Semester – IV

(COURSE SCHEME & MARKS DISTRIBUTION)

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	sional CoreCourse	PCCCSE401	Object – oriented Programming with Java	3	1	0	**4**	30	70	21	100	35
2	sional CoreCourse	PCCCSE402	Database Management Systems	3	1	0	**4**	30	70	21	100	35
3	sional CoreCourse	PCCCSE403	Software Engineering	3	0	0	**3**	30	70	21	100	35
4	sional CoreCourse	PCCCSE404	Design and Analysis of Algorithms	3	1	0	**4**	30	70	21	100	35
5	sional CoreCourse	PCCCSE405	ComputerNetwork	3	1	0	**4**	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	sional CoreCourse	PCCCSE451	Java Lab	0	0	2	**1**	30	20	10	50	25
2	sional CoreCourse	PCCCSE452	DBMS Lab	0	0	2	**1**	30	20	10	50	25
3	Internship	IN456	Internship	0	0	0	**1**	30	20	10	50	25
Total TOTAL							**22**					

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Semester – IV

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Object –oriented Programming with Java	PCCCSE401

OBJECTIVES:

The course should enable the students to: I. Understand the basic object oriented programming concepts and apply them in problem solving. II. Illustrate inheritance concepts for reusing the program. III. Demonstrate on the multi-tasking by using multiple threads. IV. Develop data-centric applications using JDBC. V. Understand the basics of java console and GUI basedprogramming.

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

COURSE LEARNING OUTCOMES (CLOs):

1. Use object oriented programming concepts to solve real world problems.
2. Explain the concept of class and objects with access control to represent real world entities.
3. Demonstrate the behavior of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.
4. Use overloading methodology on methods and constructors to develop application programs.
5. Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords.
6. Describe the concept of interface and abstract classes to define generic classes.
7. Use dynamic and static polymorphism to process objects depending on their class.
8. Illustrate different techniques on creating and accessing packages (fully qualified name and

import statements).

9. Understand the impact of exception handling to avoid abnormal termination of program using checked and unchecked exceptions.\
10. Demonstrate the user defined exceptions by exception handling keywords (try, catch, throw, throws and finally).
11. Use multithreading concepts to develop inter process communication.
12. Understand and implement concepts on file streams and operations in java programming for a given application programs.
13. Describe the backend connectivity process in java program by using JDBC drivers.
14. Develop java application to interact with database by using relevant software component (JDBC Driver).
15. Understand the process of graphical user interface design and implementation using AWT or swings.
16. Use different layouts (Flow Layout, Boarder Layout, Grid Layout, Card Layout) to position the controls for developing graphical user interface.

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Semester – IV

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Database Management Systems	PCCCSE402

Course Objectives: The objective of the course is to present an introduction to database management systems, with an emphasis on how to organize, maintain andretrieve - efficiently, and effectively - information from a DBMS.

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 toBCNF).

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-Queryingand 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. Ullmanand Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.
4. Peter Roband Corlos Coronel-"Database System, Design, Implementation and Management", Thompson Learning Course Technology- Fifth edition, 2003.

Learning Outcomes:

Upon successful completion of this course, students should be able to: • Describe the fundamental elements of relational database management systems • Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL. • Design ER-models to represent simple database application scenarios • Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data. • Improve the database design by normalization. • Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.

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Semester – IV

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Software Engineering	PCCCSE403

The program will prepare our students to be successful professionals in the field with solid fundamental knowledge of software engineering.

1. Be successful professionals in the field with solid fundamental knowledge of software engineering
2. Utilize and exhibit strong communication and interpersonal skills, as well as professional and ethical principles when functioning as membersand leaders of multi-disciplinary teams
3. Apply their foundations in software engineering to adapt to readily changing environments using the appropriate theory, principles andprocesses

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 tests – 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

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.

Learning Outcomes:

All Software Engineering students will have demonstrated:

1. How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
2. An ability to work in one or more significant application domains
3. Work as an individual and as part of a multidisciplinary team to develop and deliver quality software
4. Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
5. Demonstrate an ability to use the techniques and tools necessary for engineering practice.

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Semester – IV

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Design and Analysis of Algorithms	PCCCSE404

Course Objectives:

Upon completion of this course, students will be able to do the following:

- Analyze the asymptotic performance of algorithms.
- Write rigorous correctness proofs for algorithms.
- Demonstrate a familiarity with major algorithms and data structures.
- Apply important algorithmic design paradigms and methods of analysis.
- Synthesize efficient algorithms in common engineering design situations.

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– Divideand 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:

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 ComputerAlgorithms",Pearson Education Asia, 2003.

Course Outcomes:

Students who complete the course will have demonstrated the ability to do the following:

- Argue the correctness of algorithms using inductive proofs and invariants.
- Analyze worst-case running times of algorithms using asymptotic analysis.
- Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.

- Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic- programming algorithms, and analyze them.
- Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.
- Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate. Synthesize new graph algorithms and algorithms that employ graph computations as key components, and analyze them.

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – IV

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Computer Network	PCCCSE405

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 – FiberOptics – Line Coding – Modems – RS232 Interfacing sequences.

UNIT II

DATA LINKLAYER

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 – DE multiplexing – Sockets – User Datagram Protocol (UDP)

–Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – IntegratedServices.

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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 the Internet", Pearson Education, 2003.
2. Larry L. Peterson and Peter S. Davie, "Computer Networks", Harcourt Asia Pvt. Ltd., SecondEdition.
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.

Course Outcomes:

At the end of course , the student will be able to

- Explain basic concepts, OSI reference model, services and role of each layer of OSI model and TCP/IP, networks devices and transmission media, Analog and digital data transmission
- Apply channel allocation, framing, error and flow control techniques.
- Describe the functions of Network Layer i.e. Logical addressing, subnetting & Routing Mechanism.
- Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism.
- Explain the functions offered by session and presentation layer and their Implementation.
- Explain the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP, TELNET and VPN. K2 DETAILED SYLLABUS 3-0-0 Unit Topic Proposed Lecture I Introductory Concepts: Goals and applications of networks, Categories of net.

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New Scheme Based on AICTE Flexible Curricula

Semester – IV

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Java Lab	PCCCSE451

1. WAJP to show the characteristic of a number. {E.g. 24 it has two coefficients 2 in tens position and 4 in units position. It is composed of 2 and 3. It is a positive number. Also show whether it is odd or even.
2. WAJP to take input through command line argument and do the following:

a. Check whether the number is prime.

b. Generate the reverse a number.

3. Write a menu driven program using switch in Java to perform following:

a. For input of 1, check whether the number is prime

b. For input of 3, find the factors of the number

c. For input of 5, check the number is odd or even.

4. Write a program in Java to generate hexadecimal equivalent of a number without using array.
5. WAJP to take two number inputs through command line argument and do the following:

a. Check whether two numbers are prime to each other or not.

b. Find LCM of two numbers.

6. WAJP to create a class and exhibit the role of static functions (other than main) by declaring, defining and calling them.
7. WAJP to compute and display the count of occurrence of 4 in a number. E.g. 4564 will compute 2.
8. WAJP to take an angle value in degrees and then compute the equivalent radians and then proves in $^{2}\cos^{2}$ 1. Note 180^{o} ^{c} .
9. WAJP to sort a list of numbers in ascending order.
10. WAJP to generate Pascal's Triangle using a square matrix.

11. Write a program in Java to take input of two 3×3 matrices through command line argument and then:

a. Add them up and display the result

b. Subtract them and display the result

c. Multiply them and display product

12. WAJP to count the number of words, characters in a sentence.

13. Write a program in Java to take input of a sentence through command line argument and thencount the number of words and vowels.

14. WAJP to handle the Exception using try and multiple catch block; the exceptions that you will handle are, number format error, array bound error and divide by zero.

15. WAJP to create a class called **Room** with two data member length and width and then implement constructor overloading in it.

16. Write a program in Java to explain the role of the following:

a. Non-parameterized constructor

b. Parameterized constructor

c. Copy constructor

17. Take input and display the output.

18. WAJP to create a class called **Fraction** with data member numerator and denominator; take input (through command line argument) of two fractions and then add, subtract, multiply and divide, finally display the result in reduced term.

19. Write a program in Java to create a class for **Employee** having 2 data member code and name. Then create 3 classes **Officer**, **AdminStaff** and **MStaff**. The **Officer** class has data members designation and pay-scale; the **AdminStaff** has data members grade and pay-band; the **MStaff** has data member department and two sub-classes **Regular** and **Casual**. The **Regular** staff has data members level and consolidated-pay and **Casual** has data member daily-wage. Take all inputs through constructors and write appropriate methods for displaying one data for each type of class.

20. WAJP to design a class called **Account** using the inheritance and static that show all function of

bank (withdrawal, deposit) and generate account number dynamically.

21. WAJP to design an application *Password.java* that produces and prints a random password depending upon name of an individual. If the input is Abdul Kalam then the password would be *33421LAM*. Note: take the first name A=1, B=2, D=4, U=21 where 2+1=3, and L=12, where 1+2=3; so the number comesto be, so u can find out.

WAJP to draw a format like *

***

*****

****

*****

***

*

22. WAJP to take a string count all vowels and then delete the same from the string.
23. Write a **Patient** class which inherits from the **Person** class. Patient can again be of two types, indoor and outdoor. The Patient class requires the following:

a. a variable to store the patient ID for the patient
b. a variable to store the department of hospital
c. a variable to store the ward of hospital
d. a variable to store the patient 's date of joining the hospital
e. variable to store the patient 's address
f. a variable to store the medical fees that the patient pays
g. constructor methods, which initialize the variables
h. a method to calculate the medical fees (for both indoor and outdoor patient)

24. WAJP to take a string as password and check whether it contains at least two numbers, 3 alphabetsand no space in it. If any contrary throw message.
25. Write a program in Java to create a class called Rational having two data members for numerator and denominator. Take two inputs of rational numbers and perform multiplication and division. Display the result in reduced form.
26. Write a program in Java to print a format like,
27. Write a class called **Shape** which contains a user-defined interface for **Computation**, which contains methods for calculation of area, perimeter and volume. Write four classes for **circle, rectangle, sphere** and **rectangular parallelepiped**, and all these classes inherit from Shape. Now take input for the following:

a. radius of circle and compute its area and perimeter
b. Length and breadth of rectangle and compute its area and perimeter
c. Length, breadth and height for **rectangular parallelepiped** and compute its area and volume
d. Radius of sphere and compute its area and volume

33. ** Area of circle= r^2 , perimeter of circle= $2\ r$, area of sphere= $4\ r^2$, volume of sphere= $4\ r^3$, volume
    i. 3
34. of rectangular parallelepiped = $l\ b\ h$ area of rectangularparallelepiped= $2(l\ b\ b\ h\ h\ l)$

35. Write a class called Employee, which requires the following:

a. a variable to store the employee ID
i. employee ID should be of format EMP**M**1234, EMP**S**1234, EMP**A**1234, EMP**C**1234, where M=manager, S=supervisor, A=analyst, C=clerk; number can be any no. but first three characters should be EMP
b. a variable to store the employee name
c. a variable to store department
d. a variable to store city
e. a variable to store basic salary

f. a method to calculate the salary of employee

i. if the city is metro then the HRA would be 30% else 20%

ii. if the employee ID contain M then DA would be 120%, if S then DA would be110%,if A then DA would be 100%, and if C then DA would be 90%

g. constructor methods, which initialize the variables

35. WAJP to create 4 threads and show exhibit their execution after the call of the “start ( )” method. Write aprogram in Java to create 3 threads and exhibit their behaviour by changing their prioritiesin the “main”thread. Display the possible output.

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New Scheme Based on AICTE Flexible Curricula

Semester – IV

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	DBMS Lab	PCCCSE452

Consider the following tables: emp (empno, e name, job, mgr, hiredate, sal, comm, deptno, gr), dept (deptno, dname, loc)

Write the following queries:

1. List all information about all departments from emp table.
2. List all employee names along with their salaries from emp table.
3. List all department numbers, employee numbers and their managers numbers in descendingorder of deptno from emp table.
4. List department names and locations from the dept table.
5. List the employees belonging to the department 20.
6. List the name and salary of the employees whose salary is more than 1000.
7. List the names of the clerks working in the department 20.
8. List the names of analysts and salesmen.
9. List the details of the employees who have joined before the end of September 81.
10. List the names of employees who are not managers.
11. List the names of employees whose employee number are 7369, 7521, 7839, 7934, 7788.
12. List the employee details not belonging to the department 10, 30, and 40.
13. List the employee name and salary, whose salary is between 1000 and 2000.
14. List the employee names, who are not eligible for commission.(salary having >15,000 eligible forcommission)
15. List the employees who are eligible for commission.
16. List the details of employees, whose salary is greater than 2000 and commission is NULL.

17. List the employees whose names start with an "S" (not"s").
18. List the name, salary and PF amount of all the employees(PF is calculated as 10% of salary).
19. List the empno, ename, sal in ascending order of salary.
20. List the employee name, salary, job and Department no descending order of Department Noand salary.
21. List the employee details in ascending order of salary.
22. List the employee details in descending order of salary
23. Display name, and sal and commission of all employees whose monthly salary is greaterthan their commission. Variable in a statement which finds all employees who earn $30000 a year or more.
24. Select SMITH HAS WORKED IN THE POSITION OF CLERK IN DEPT 20.Displayresult in this format.
25. Generate a statement which prompts the user at runtime. The intention is to displayemployees hired between 2 given dates.
26. Define a variable representing an expression used to calculate total annual remuneration. Use the list all the employees name and salaries increased by 15% and expressed as a wholenumber of dollars.
27. Produce the following

EMPLOYEE AND JOB

SMITH	CLERK
ALLEN	SALESMAN

28. Produce the following output:SMITH (Clerk)

ALLEN (Salesman)

29. Do a case sensitive search for a list of employees with a job that the user enters.
30. It has been discovered that the sales people in dept. 30 are not all male. Please produce the Followingoutput.

ENAME	DEPTNO	JOB
ALLEN	30	Sales People

31. Display each employees name and hire date of dept 20
32. Display each employees name, hiredate and salary review date. Assume salary review date is one year from hiredate. Output should be in ascending review date.
33. Print list of employees displaying just salary, if more than 1500. If exactly 1500 display " On Target". If less than 1500 display " Below 1500"
34. Write a query which returns DAY of the week (i.e. MONDAY) for any date entered in the format DD/MM/YY.
35. Write a query to calculate length of service of each employee.
36. Find the minimum salary of all employees.
37. Find the maximum, minimum, and average salaries of all employees.
38. List the maximum and minimum salary of each job type.
39. Find how many managers are in each dept.
40. Find the average salary and average total remuneration of each job type. Remembers sales man earn commission.
41. Find out the difference between highest and lowest salary.
42. Find all department s which have more than three employees.
43. Check whether all employee nos are unique. (No Duplicate)
44. List lowest paid employee working for each Manager. Exclude any groups where the minimum salary is less than 1000. Sort the output by salary.
45. Produce a list showing employees 'salary grade'.(> 10000 A, >10000 &<20000 B, >20000 C)
46. Show only employee on Grade C.
47. Show all employee in Dallas.
48. List the employees name, job, salary, grade and department for everyone in the company except clerks. Sort on salary, displaying the highest first.
49. List the following details of employees who earn $36000 a year or who are clerks.

    Ename Job Annual Sal Dept. no

    Dname Grade
50. Display all employees who earn less than their managers.

51. Display all employees by name and eno along with their managers name and number.
52. Modify above spoliation to display KING who has no MANAGER.
53. Find the job that was files in the first half of 1983 and the name job that was filled in the same period in 1984.
54. Find all employees who have joined before their manager.

EMPLOYEE HIREDATE MANAGER HIREDATE

55. Find the employees who earn the highest salary in each job, type, sort in descending order of salary.
56. Find the employees who earn the minimum salary for their job, Display the result in descending order of salary
57. Find the most recently hired employees in the department. Order by hiredate.
58. Show the details of any employee who earns a salary greater than the average for their department. Sort in department number order.
59. List all department where there are no employees.

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

Department of Computer Science & Engineering New Scheme Based on AICTE Flexible Curricula

Semester – IV

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Internship	IN456

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Choice Based Credit System Semester

Semester – V

(COURSE SCHEME & MARKS DISTRIBUTION)

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	rofessional CoreCourse	PCCCSE501	Formal Language and Automata Theory	3	1	0	**4**	30	70	21	100	35
2	rofessional CoreCourse	PCCCSE502	Object Oriented Programming and DesignPattern	3	1	0	**4**	30	70	21	100	35
3	rofessional CoreCourse	PCCCSE503	Unix/Linux	3	1	0	**4**	30	70	21	100	35
4	essional ElectiveCourse	PECCSE501	ProfessionalElective –I	3	0	0	**3**	30	70	21	100	35
5	Open Elective Course	OECCSE501	Open Elective I/MOOCS-I	3	0	0	**3**	30	70	21	100	35
PRACTICAL DEMONSTRATION MOOCS												
1	ofessional CoreCourse Lab	PCCCSE552	Unix/Linux Lab	0	0	2	**1**	30	20		50	25
2	essional Elective-ICourse Lab	PCCCSE553		0	0	2	**1**	30	20		50	25
TOTAL							**20**					

Departmental Elective-I (Choose any one)
Programming in Python
Computer Graphics

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

Cloud Computing
Android Programming

Open Elective -I (Choose any One)
Digital Signal Processing
Control System
MOOCS-I

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Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Formal Language and Automata Theory	PCCCSE501

COURSE Objectives:

A finite automaton (FA) is a simple idealized machine used to recognize patterns within input taken from some character set (or alphabet) C. The job of an FA is to accept or reject an input depending on whether the pattern defined by the FA occurs in the input.

UNIT I

AUTOMATA Introduction to formal proof – Additional forms of proof – Inductive proofs – Finite Automata (FA) – Deterministic Finite Automata (DFA) – Non-deterministic Finite Automata (NFA)

– Finite Automata with Epsilon transitions.

UNIT II

REGULAR EXPRESSIONS AND LANGUAGES Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.

UNIT III

CONTEXT-FREE GRAMMAR AND LANGUAGES Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Definition of the Pushdown automata – Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG, Deterministic Pushdown Automata.

UNIT IV

PROPERTIES OF CONTEXT-FREE LANGUAGES Normal forms for CFG – Pumping Lemma for CFL - Closure Properties of CFL – Turing Machines– Programming Techniques for TM.

UNIT V

UNDECIDABILITY A language that is not Recursively Enumerable (RE) – An un decidable problem that is RE – Undecidable problems about Turing Machine – Post's Correspondence Problem- The classes P and NP.

TEXT BOOK :

1. J.E.Hopcroft, R.Motwani and J.D Ullman, "Introduction to Automata Theory, Languages and Computations", Second Edition, Pearson Education, 2003.

REFERENCES:

1. H.R.Lewis and C.H.Papadimitriou, "Elements of The theory of Computation", Second Edition, Pearson Education/PHI, 2003
2. J.Martin, "Introduction to Languages and the Theory of Computation", Third Edition, TMH, 2003.
3. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997

Course Outcomes:

Understand the basic properties of formal languages and grammars. Differentiate regular, context-free and recursively enumerable languages. make grammars to produce strings from a specific language. Including decidability and intractability**.**

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Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Object Oriented Programming and DesignPattern	PCCCSE502

Objectives

- To understand the Object-based view of Systems
- To develop robust object-based models for Systems
- To inculcate necessary skills to handle complexity in software design

UNIT - I

INTRODUCTION TO UML: Introduction to object oriented concepts like inheritance, Polymorphism, Information hiding, Importance of modeling, Principles of modeling, Object oriented modeling, An overview of UML, Conceptual model of the UML, Architecture, Software development life cycle.

BASIC STRUCTURAL MODELING: Classes: Terms and concepts, Common modelling techniques; Relationships Modelling simple dependencies, Single inheritance and structural relationships; Common mechanisms and diagrams.

ADVANCED STRUCTURAL MODELING: Advance classes, Advance relationships, Interfaces, Types and Roles, Packages, Instances.

UNIT - II

THE OBJECT-ORIENTED DESIGN PROCESS: The object and class Concepts, Identifying classes, Identifying responsibilities, Relationships between Classes, Use Cases, CRC cards, UML class diagrams, Sequence diagrams, State diagrams, Using Java doc for design documentation, CaseStudy: A voice mail system.

UNIT – III

GUIDELINES FOR CLASS DESIGN: An overview of the date classes in the java library, designing a day class, the importance of encapsulation, analyzing the quality of an interface, programming by contract, unit testing.

INTERFACE TYPES AND POLYMORPHISM: The icon interface type, polymorphism, drawing shapes, the comparable interface type, the comparator interface type, anonymous classes, frames anduser interface components, user interface actions, timers, designing an interface type.

UNIT - IV

PATTERNS AND GUI PROGRAMMING: Iterators, the pattern concept, the observer pattern, layout managers and the strategy pattern, components, containers and the composite pattern, scroll bars and the decorator pattern, how to recognize patterns, putting patterns to work.

INHERITANCE AND ABSTRACT CLASSES: The concept of inheritance, graphics programming with inheritance, abstract classes, the template method pattern, protected interfaces, the hierarchy of swing components, the hierarchy of standard geometric shapes, the hierarchy of exception classes, when not to use inheritance.

UNIT - V

FRAMEWORKS: Frameworks, applets as a simple framework, the collections framework, a graph editor framework, enhancing the graph editor framework.

MULTITHREADING: Thread basics, Thread synchronization, Animations.

MORE DESIGN PATTERNS: The Adapter pattern, Actions and the command pattern, the factory method pattern, the proxy pattern, the singleton pattern, the visitor pattern, other design patterns.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson (2009), The Unified Modeling Language User guide, 2nd edition, Pearson Education, New Delhi, India.

2. Cay Horstmann (2004), Object-Oriented Design and Patterns, Wiley India edition, New Delhi, India.

REFERENCE BOOKS:

1. Meilir Page-Jones (2000), Fundamentals of Object Oriented Design in UML, Pearson Education and New York.
2. Craig Larman (2005), An introduction to Object –Oriented Analysis and Design and Unified Process Appling UML and Patterns, 3rdedition, Pearson Education, New Delhi, India.
3. John W. Satzinger, Robert B Jackson, Stephen D Burd (2004), Object-Oriented Analysis and Design with the Unified Process, Cengage learning, India.

Learning Outcomes

- Ability to analyze and model software specifications.
- Ability to abstract object-based views for generic software systems.
- Ability to deliver robust software components.

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New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Unix/ Linux	PCCCSE503

OBJECTIVES:

- Written technical communication and effective use of concepts and terminology.
- Facility with UNIX command syntax and semantics.
- Ability to read and understand specifications, scripts and programs.
- Individual capability in problem solving using the tools presented within the class. Students will demonstrate a mastery of the course materials and concepts within in class discussions

UNIT-I

Overview of Unix/Linux: - Concepts, Unix/Linux Installation Process, Hardware Requirements for Unix/Linux ,Advantages of Unix/Linux, Reasons for Popularity and Success of Linux/Unix Operating System, Features of Linux/Unix Operating System, Kernel, Kernel Functions, The Shell Basic Commands, Shell Programming:-Shell Variables, Branching Control Structures, Loop-Control Structure, Continue and break Statements, Sleep Command, Debugging Script. Use of Linux as web- server, file server, directory server, application server, DNS server, SMTP server, Firewall, Proxy server.

UNIT-II

File System: - Definition of File System, Defining Geometry, Disk Controller, Solaris File System, Disk Based File Systems, Network-Based File Systems, Virtual File systems, UFS File System, The Boot Block, The Super Block, The Inode, Tuning File System, Repairing File System.

UNIT-III

Process Control: - Viewing a Process, Command to display Process, Process Attributes, Process States, Process Fields, PS Commands options, PGREP, PRSTAT, CDE Process Manager, Scheduling Process, Scheduling priorities, changing the Priority of a time-sharing process, Killing Process.

UNIT-IV

System Security: - Physical Security, Controlling System Access, Restricted Shells Controlling File Access, File Access Commands, Access Control List(ACLs), Setting ACL Entries, Modifying ACL entries on a file, Deleting ACL entries on a file, Restricting FTP, Securing Super User Access, Restricting Root Access, Monitoring super user Access, TCP Wrappers.

UNIT-V

Dynamic Host Configuration Protocol: - Introduction, DHCP Leased Time, DHCP Scopes, DHCP IP Address, Allocation Types, Planning DHCP Deployment, DHCP Configuration files, Automatic Startup of DHCP Server, Configuration of DHCP Clients, Manually Configuring the DHCP.

UNIT-VI

Case Study: - Installation of Linux, Customization of Linux, Installation of SAMBA, APACHE,TOMCAT, Send MAIL, Postfix, Implementation of DNS, LDAP services, Firewall, Proxyserver

Text Book:

1. Venkatesh Murthy, “Introduction to Unix &Shell”, Pearson Edu
2. Forouzan, “Unix &Shell Programming”, Cengage Learning
3. Sumitab Das,”Unix Concept & Application”,TMH
4. Gopalan, Shivaselvan,”Beginners Guide to Unix ” PHI Learning

Learning Outcome:

On completion of this course the student should be able to: Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security, and develop shell scripts to perform more complex tasks.

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New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective -I	PECCSE501

Python Programming

Learning Objectives:

When students complete Intro to Programming with Python, they will be able to: Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions. Work with user input to create fun and interactive programs.

Unit – I

Introduction to Computers, Programs, and Python: Introduction, Programming Languages, Operating Systems, The History of Python, Features of python language, Getting Started with Python, Programming Style and Documentation, Programming Errors.

Elementary Programming: Introduction, Writing a Simple Program, Reading Input from the Console, Identifiers, Variables, Assignment Statements, and Expressions, Simultaneous Assignments,

Named Constants, Numeric Data Types and Operators, Evaluating Expressions and Operator Precedence, Augmented Assignment Operators, Type Conversions and Rounding.

Unit – II

Mathematical Functions, Strings, and Objects: Introduction, Common Python Functions, Strings and Characters, Introduction to Objects and Methods, Formatting Numbers and Strings.

Control Structures: Selections: Introduction, Boolean Types, Values, and Expressions, if Statements, Two-Way if-else Statements, Nested if and Multi-Way if-elif-else Statements, Logical Operators, Conditional Expressions, Loops: Introduction, The while Loop, The for Loop, Nested Loops, Keywords break and continue

Unit – III

Functions: Introduction, Defining a Function, Calling a Function, Functions with/without Return Values, Positional and Keyword Arguments, Passing Arguments by Reference Values, Modularizing code, The Scope of Variables, Default Arguments, Returning Multiple Values.

Lists:

Introduction, List Basics, Copying Lists, Passing Lists to Functions, Returning a List from a Function, Searching Lists, Sorting, Processing Two-Dimensional Lists, and Passing Two-Dimensional Lists to Functions, Multidimensional Lists.

Unit – IV

Tuples, Sets, and Dictionaries: Introduction, Tuples: Creating Tuples, Basic Tuple Operations, Indexing and Slicing in Tuples, Tuple methods, Sets: Creating Sets, Manipulating and Accessing Sets, Subset and Superset, Set Operations, Comparing the Performance of Sets and Lists, Dictionaries: Creating a Dictionary, Adding, Modifying, and Retrieving Values, Deleting Items, Looping Items, The Dictionary Methods.

Unit – V

Objects and Classes: Introduction, Defining Classes for Objects, Immutable Objects vs. Mutable Objects, Hiding Data Fields, Class Abstraction and Encapsulation, Object-Oriented Thinking.Inheritance and Polymorphism: Introduction, Superclasses and Subclasses, Overriding Methods, The **object** Class, Polymorphism and Dynamic Binding, The **isinstance**Function. Class Relationships: Association, Aggregation, composition.

Files and Exception Handling: Introduction, text input and ouput: opening a file, Writing Data, Testing a File's Existence, Reading All Data from a File, Writing and Reading Numeric Data, Binary IO Using Pickling, Exception Handling, Raising Exceptions.

TEXT BOOK

1. Y. Daniel Liang, "Introduction to programming using python", Pearson Education; Firstedition (2017).

REFERENCE BOOK

1. Martin C. Brown, "Python: The Complete Reference", McGraw Hill Education; Forthedition (2018).
2. Mark Lutz, "Learning Python" O′Reilly Fifth edition (2013)
3. Mark Summerfield, "Programming in Python 3: A Complete Introduction to the PythonLanguage" PearsonEducation; Second edition (2018)

OUTCOMES:

- Documentation will demonstrate good organization and readability.
- File processing projects will require data organization, problem solving and research.
- Scripts and programs will demonstrate simple effective user interfaces.
- Scripts and programs will demonstrate effective use of structured programming.
- Scripts and programs will be accompanied by printed output demonstrating completion of a test plan.
- Testing will demonstrate both black and glass box testing strategies.
- Project work will involve group participation.

RKDF UNIVERSITY RANCHI

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Professional Elective -I	PECCSE501

Computer Graphics

Course objectives:

The course **introduces the basic concepts of computer graphics**. It provides the necessary theoretical background and demonstrates the application of computer science to graphics. The course further allows students to develop programming skills in computer graphics through programming assignments.

Unit – I

Introduction to Graphics Systems: Video Display Devices, Raster Scan Systems, Random Scan Systems, Graphics Monitors and Workstations, Input Devices, Hard Copy Devices, Graphics Software. Three-Dimensional Viewing Devices, Stereoscopic & Virtual Reality Systems

Unit – II

Output Primitives: Points and Lines, Line Drawing Algorithms (DDA and Bresenham's Algorithms), Loading the Frame Buffer, Circle Generating Algorithm, Filled Area Primitives – Scan-line Polygon Fill Algorithm, Boundary-Fill Algorithm, Flood-Fill Algorithm, Color Tables.

Unit – III

2D Transformation and Viewing: Basic Transformations, Matrix Representations and Homogeneous Coordinates, Composite Transformations (Translations, Rotations, Scalings), Other Transformations (Reflection and Shear), The Viewing Pipeline, Viewing Coordinate Reference Frame, Window-to- Viewport Coordinate Transformation, Clipping- Point, Cohen-Sutherland Line Clipping and Sutherland- Hodgeman Polygon Clipping.

Unit – IV

Three-Dimensional Geometric Transformations: Translation, Rotation, Scaling.

Unit – V

Introduction to Multimedia Systems and Multimedia Components: Multimedia Systems, Multimedia Presentation and Production, Characteristics of Multimedia Presentation, Uses of Multimedia. CDFormats, DVD, DVD Formats. Text and its File Formats, Image Types and File Formats,Fundamental Characteristics of Sound, Audio File Formats, Video, Transmission of Video Signals, Video File Formats.

TEXT BOOKS

1. Hearn D. and Baker M. P., "Computer Graphics: C Version", 2nd Edition, Pearson Education, 2007.
2. Buford J. F. K., "Multimedia Systems", 1st Edition, Pearson Education, 2005.

REFERENCE BOOKS

1. Foley J. D., Dam A. Van, Feiner S. K. and Hughes J. F., "Computer Graphics: Principles and Practice in C", 2nd Edition, Pearson Education, 2000.
2. Parekh R., "Principles of Multimedia", 2nd Edition, Tata McGraw Hill, 2012.

Learning Outcomes:

Understand the basics of computer graphics, different graphics systems and applications of computer graphics.

b) Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.

c) Use of geometric transformations on graphics objects and their application in composite form.

d) Extract scene with different clipping methods and its transformation to graphics display device.

e) Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

f) Render projected objects to naturalize the scene in 2D view and use of illumination models for this.

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective -I	PECCSE501

Course Objective:

Cloud Computing

To provide students with the fundamentals and essentials of Cloud Computing.

To provide students a sound foundation of the Cloud Computing.

Unit – I

Cloud computing at a glance, Distributed Systems, Virtualization, Web 2.0,

Unit – II

Eras of Computing, Elements of Distributed Computing, Concepts of Virtualization and its characteristics, Virtualization and cloud computing, cloud reference model, types of clouds, economics of the cloud.

Unit – III

Cloud Interoperability and standards:

Amazon Web Services: Compute Services, Storage Services, Communication Services. Google App Engine: Architectural and Core Concepts, Application Life-Cycle, Cost Model. Microsoft Azure: Azure Core Concepts, SQL Azure.

Unit – IV

Energy-Efficiency in clouds, Energy-Efficient and Green Cloud Computing Architecture, Market-Oriented Cloud Computing, Federated clouds: characterization and definition, cloud federation stack. Cloud Security and Trust Management: Cloud Security Defense Strategies

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Unit – V

Application of clouds in: Health care, Biology, CRM, ERP, Social Networking, Productivity and Geoscience. Cloudlets for Mobile Cloud Computing.

TEXT BOOK

1. Buyya Rajkumar, Charles, Vecchiola Christian and Selvis. Thamarai "Mastering Cloud Computing", McGraw Hill Education (India) Private Limited,2013.

REFERENCE BOOK

1. Hwang Kai, Fox Geoffrey C., Dongarra Jack J., "Distributed and Cloud Computing from Parallel Processing to the Internet of Things", Morgan Kaufmann - India Edition, 2012.

Learning Outcomes:

On successful completion of this module the learner will be able to:

- Analyze and document problems with existing software development strategies as applied to web design
- Investigate and Employ alternative Agile Development Strategies
- Evaluate cloud services, Infrastructure as a service, Platform as a service, Software as a service and determine when they are appropriate touse
- Compare and contrast Web based client-server models and cloud models and their associated models of computation
- Design and implement cloud applications.
- Demonstrate a critical understanding of how applications are deployed and coasted in the cloud and take advantage of elastic resources
- Discuss the role of virtualization in the cloud.

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New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Professional Elective -I	PECCSE501

Android Programming

Android Programming Course Objectives:

In this course, Students will learn about:

- Creating robust mobile applications and learn how to integrate them with other services
- Creating intuitive, reliable mobile apps using the android services and components
- Create a seamless user interface that works with different mobile screens

Unit – I

What is Android? Android Eco System, Features of Android, Architecture of Android, Android Version, Android SDK, Android Development tools, Anatomy of an Android Application.

Unit – II

Android User Interface: Linear Layout, Absolute Layout, Frame Layout, Relative Layout, Table Layout.

Unit – III

Designing User Interface with View: Text View, Push Button, Image Button, Edit Text, Checkbox, Toggle Button, Radio Button, Progress Bar, Spinner, List View, Grid view, Time and Date Picker.

Unit – IV

Displaying Pictures and Menus with Views: Gallery Views, Image Switcher, Grid View, Options Menu, Context Menu, Digital Clock View, Web view. SMS Messaging: Sending SMS Messages Programmatically.

Unit – V

SQLite Database in Android: SQLite Database, Creation and connection of the database, extractingvalues from a cursor.

TEXT BOOK

1. Dixit Prashant Kumar, "Android", Vikas Publishing House Pvt. Ltd, 1st Edition, 2014.

REFERENCE BOOK

Lee Wei- Meng, "Beginning Android for Application Development", Wiley, Indian Edition.

Learning Outcome:

After completing this course, Students will be able to:

1. Build enterprise level mobile applications with Kotlin on Android
2. Understand both the basic and advanced concepts of Kotlin
3. Understand why use Kotlin over Java
4. Install and configure Android Studio
5. Explain and use key Android programming concepts
6. Deploy the application on Google Play
7. Become a certified Android developer

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Open Elective I/MOOCS-I	OECCSE501

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	OOPDP Lab	PCCCSE552

1. Take input from user a character variable in a program and if the value is alphabet then print "Alphabet" if it's a number then print "Digit" and for other characters print "Special Character"
2. Write a program to add all the values in a given number and check if the sum is prime number or not. Ex: 1234->10, not prime
3. Write a program to find the largest 2 numbers and the smallest 2 numbers in the array initialized by the user.
4. Write a program to print the element of an array that has occurred the highest number of times Eg) Array -> 10,20,10,30,40,100,99 O/P:10
5. Write a program to reverse the elements of a given 2*2 array. Four integer numbers needs to be passed as Command Line arguments Eg: C:\>java Sample 1 2 3 4 O/P Expected : The given array is : 1 2 3 4 The reverse of the array is : 4 3 2 1
6. Write a program to find greatest number in a 3*3 array. The program is supposed to receive 9 integer numbers as command line arguments.
7. Create a class Box that uses a parameterized constructor to initialize the dimensions of a box.(dimensions are width, height, depth of double type). The class should have a method that calculates and returns the volume of the box . Obtain an object and print the corresponding volume in main() function.
8. Write a program in Java with class Rectangle with the data fields width, length, area and color. The length, width and area are of double type and color is of string type. The methods are set_length() , set_width() , set_color(), and find_area(). Create two object ofRectangle and compare their area and color. If area and color same for the objects then display "Matching Rectangles" otherwise display

"Non Matching Rectangle".

9. Create a class named 'Animal' which includes methods like eat() and sleep(). Create a child class of Animal named 'Bird' and override the parent class methods. Add a new method named fly(). Create an instance of Animal class and invoke the eat and sleep methods using this object. Create an instance of Bird class and invoke the eat, sleep andfly methods using this object.

10. High School application has two classes: the Person superclass and the Student subclass. Using inheritance, in this lab you will create two new classes, Teacher and College Student. A Teacher will be like Person but will have additional properties such as salary (the amount the teacher earns) and subject (e.g. "Computer Science", "Chemistry", "English", "Other"). The College Student class will extend the Student class by adding a year (current level in college) and major (e.g. "Electrical Engineering", "Communications", "Undeclared").
11. Create a class Account with two overloaded constructors. First constructor is used for initializing, name of account holder, account number and initial amount in account. Second constructor is used for initializing name of account holder, account number, address, type of account and current balance. Account class is having methods Deposit (),With Draw(), and Get Balance().Make necessary assumption for data members and return types of the methods. Create objects of Account class and use them.
12. Create a base class Fruit which has name,taste and size as its attributes. A method called eat() is created which describes the name of the fruit and its taste. Inherit the same in 2 other class Apple and Orange and override the eat() method to represent each fruit taste.
13. Reverse the string but not the words. Eg. I/P: Birla institute of technology O/P: technology of institute birla.
14. Find out and print the maximum possible palindrome in a given string. Eg: I/P: nononsene O/P: nonon
15. Given a string and a non-empty word string, return a string made of each char just before and just after every appearance of the word in the string. Ignore cases where there is no char before or after the word, and a char may be included twice if it is between two words. If inputs are "abcXY123XYijk" and "XY", output should be "c13i". If inputs are "XY123XY" and "XY", output

should be "13".

16. Create an abstract class Compartment to represent a rail coach. Provide an abstract function notice in this class. Derive FirstClass, Ladies, General, Luggage classes from the compartment class. Override the notice function in each of them to print notice suitable to the type of the compartment.
17. Create a class Test Compartment. Write main function to do the following: Declare an array of Compartment of size 10. Create a compartment of a type as decided by a randomly generated integer in the range 1 to 4. Check the polymorphic behavior of the notice method. Q2.Write a program in java which implement interface Student which has two methods Display Grade and Attendance for PG Students and UG Students (PG Students and UG Students are two different classes for Post Graduate and Under Graduate Students respectively).
18. Write a program in Java to display name and roll number of students. Initialize respective array variables for 10 students. Handle Array Index out of Bounds Exception, so that any such problem does not cause illegal termination of program.
19. Write a program to accept name and age of a person from the command prompt(passed as arguments when you execute the class) and ensure that the age entered is >=18 and <
20. Display proper error messages. The program must exit gracefully after displaying the error message in case the arguments passed are not proper. (Hint: Create a user defined exception class for handling errors.)
21. Write a program to count the number of times a character appears in the File and also copy from one file to another. (Case insensitive... 'a' and 'A' are considered to be thesame)
18. Create class of Sales Persons as a thread that will display fives sales persons name. 2. Create a class as Days as other Thread that has array of seven days. 3. Call the instance of Sales Persons in Days and start both the threads 4. Suspend Sales Persons on Sundayand resume on Wednesday Note: use suspend, resume methods from thread
19. Create two threads, one thread to display all even numbers between 1 & 20, another to display odd numbers between 1 & 20. Note: Display all even numbers followed by odd numbers Hint: use join
20. Program to create a calculator with the help of AWT packages in Java.
21. Program to create a unit converter using Swings in Java.
22. APPLETS a) Working with Frames and various controls. b) Working with Dialogs and Menus. c)

Working with Panel and Layout. d) Incorporating Graphics. e) Working with colors and fonts.

TEXT BOOKS

1. Krishna P. R., Object Oriented Programming through JAVA, 1st Edition, UniversitiesPress, 2008.
2. Patrick Naghton & H. Schildt – The Complete Reference Java 2, Tata McGraw HillPublication, New Delhi.
3. Dietel, Dietel - Java How to program, 7th edition; Pearson Education, New Delhi.

REFERENCE BOOKS

1. C. Horstmann, G. Cornell - Core Java 2 Vol I & Vol II ; Pearson Education , New Delhi.
2. Balagurusamy -Programming in Java, 2nd Edition; Tata McGraw Hill Publication;New Delhi.

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Professional Elective –I Course Lab	PECCSE553

Python Programming lab

List of Programs as Assignments:

1. Write a program that displays "Hello to Python programming".
2. Write a program to read two integers and perform arithmetic operations on them (addition, subtraction, multiplication and division).
3. Write a program to read the marks of three subjects and find the average of them.
4. Surface area of a prism can be calculated if the lengths of the three sides are known. Write a program that takes the sides as input (read it as integer) and prints the surface area of the prism (Surface Area = 2ab + 2bc + 2ca)
5. A plane travels 395,000 meters in 9000 seconds. Write a program to find the speed of the plane (Speed = Distance / Time).
6. You need to empty out the rectangular swimming pool which is 12 meters long, 7 meters wide and 2 meter depth. You have a pump which can move 17 cubic meters of water in an hour. Write a program to find how long it will take to empty your pool? (Volume = l *w * h, and flow = volume/time).
7. Write a program to convert temperature from centigrade (read it as float value) to Fahrenheit.
8. A car starts from a stoplight and is traveling with a velocity of 10 m/sec east in 20 seconds. Write a program to find the acceleration of the car. [acc = (Vfinal−Vinitial)/ Time].
9. Write a Program to Prompt for a Score between 0.0 and 1.0. If the Score Is Out of Range, Print an Error. If the Score Is between 0.0 and 1.0, Print a Grade Using the Following Table

a.

Score	Grade
>= 0.9	A
>= 0.8	B
>= 0.7	C
>= 0.6	D
< 0.6	F

10. Write a Program to find the maximum of three numbers.
11. Suppose you want to develop a program to play a lottery. The program randomly generates a two-digit number, prompts the user to enter a two-digit number, and determines whether the user wins according to the following rules:

a. If the user's input matches the lottery in the exact order, the award is $10,000.

b. If all the digits in the user's input match all the digits in the lottery number, the award is $3,000.

c. If one digit in the user's input matches a digit in the lottery number, the award isi. $1,000.

12. Write a Program to Check If a Given Year Is a Leap Year.
13. Program to Find the GCD of Two Positive Numbers.
14. Write a program that prompts the user to enter a four-digit integer and displays the number in reverse order.
15. Write Python Program to Find the Sum of Digits in a Number
16. Write a program to print the sum of the following series.a) 1 + 1/2 + 1/3 +. …. + 1/n

    i. b) $1/1 + 2^2/2 + 3^3/3 + \ldots\ldots + n^n/n$

17. Write a Program to Display the Fibonacci Sequences up to nth Term Where n is provided by the User.
18. Write a Program to Find the Sum of All Odd and Even Numbers up to a Number Specified by the User.
19. Write a Program to Check Whether a Number Is Prime or Not.
20. Write a Program to Find the Factorial of a Number.
21. Write a Program to Demonstrate the Return of Multiple Values from a FunctionDefinition.
22. Program to Demonstrate the Use of Default Parameters

23. Write Program to Demonstrate the Scope of Variables.
24. Program to Print the Characters Which Are Common in Two Strings.
25. Write a program to check whether a given String is palindrome or not.
26. Write Python Program to Count the Number of Times an Item appears in the List.
27. Write a program to create a list of integer numbers. Sort the elements using any sorting method.
28. Write a program to create lists of integer numbers and perform the linear and binary search.
29. Write a program to create lists of cities names and perform the sort the cities name inalphabetical order.
30. Find Mean, Variance and Standard Deviation of List Numbers
31. Write a Program to Find the Transpose of a Matrix.
32. Write a program to perform the matrices multiplication.
33. Write a program to create a dictionary for countries name as key and currency as value. Traversve the dictionary with key: value Pairs in using for Loop.
34. Write a program to create tuples, and perform the following operations: Merging oftuples, Spliting of a tuple, comparison of two tuples.
35. Write a program to create an intersection, union, set difference, and symmetric difference of sets.
36. Write a program with “My Rectangle” class having the dimensions as data members and area () as amethod member. Calculate the area of each rectangle object created by user.
37. Design a class with name “My Complex” to represent the complex number including the constructor overloading, methods to perform the arithmetic operation over the two complex numbers. Write the complete python program for the above design.
38. Design a class with name “Distance” to represent the distance in feet and inch. Include the method to calculate the addition of two distances. Write the complete python program for theabove design.
39. Write a complete program to implement the Employee and its subclasses (Salaried Employee,Daily Waged Employee, Commission based employee) given in Hierarchical and multilevel manner. The program should exhibit the use of super key word to invoke the super class constructor.
40. Write a program to open a file and perform the reading and writing operation with the file.
41. Write a program to count the number of line in a file.
42. **Write** a program to count the frequencies of each word from a file.

43. Write a program to copy the text of a file to another file.
44. Write a program to append a file with the content of another file.

45. Write a program to compare two file.
46. Write a program to delete and insert a sentence at specified position in a file.
47. Write a program to delete a sentence from a file if the file contains a specific word.
48. Write program to delete comment lines from a file.
49. Write a program to capitalize each word of the file.
50. Write a program to delete a sentence from a file if the file contains a specific word.
51. Write program to delete comment lines from a file.
52. Write a program to capitalize each word of the file.
53. Write a program to handle an exception using exception handling mechanism of thepython.
54. Write a program to raise an exception explicitly using raise keyword.

Text Books:

1. Y. Daniel Liang, "Introduction to programming using python", Pearson Education; First edition (2017).

Reference Books:

1. Martin C. Brown, "Python: The Complete Reference", McGraw Hill Education; Forth edition (2018)Mark Lutz, "Learning Python" O′Reilly Fifth edition (2013)
2. Mark Summerfield, "Programming in Python 3: A Complete Introduction to the Python Language" Pearson Education; Second edition (2018).

RKDF UNIVERSITY RANCHI

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

R.K.D.F. UNIVERSITY, RANCHI Department of Computer Science & Engineering New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective –I Course Lab	PECCSE553

Computer Graphics Lab using c++

1. **Write a program to draw basic shapes.**
2. **Write a program to draw basic shapes.**
3. **Write a program to draw three concentric circles of increasing order.**
4. **Write a program to generate circles on the screen randomly.**
5. **Write a program to print a line using DDA Algorithm.**
6. **Write a program to print a line using Bresenham's Line Drawing Algorithm.**

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – V

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective –I Course Lab	PECCSE553

In this course, students will learn about:

Android Programming Lab

- Creating robust mobile applications and learn how to integrate them with other services
- Creating intuitive, reliable mobile apps using the android services and components
- Create a seamless user interface that works with different mobile screens

SYLLABUS

List of Programs as Assignments:

1. Write a program using Android Developer Studio/Eclipse to generate Frame Layout.
2. Write a program using Android Developer Studio/Eclipse to generate button with content "My Button".
3. Write a program using Android Developer Studio/Eclipse to generate three buttons with content "First", "Second", "Third" and then orient them along row wise.
4. Write a program using Android Developer Studio/Eclipse to generate three buttons with content "First", "Second", "Third" and then orient them along column wise.
5. Write a program using Android Developer Studio/Eclipse to create Text-View to accept user name.
6. Write a program using Android Developer Studio/Eclipse to generate the following TableLayout.

   Roll Number

   Name
7. Write a program using Android Developer Studio/Eclipse to generate the following TableLayout

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Choice Based Credit System Semester

Semester – VI

(COURSE SCHEME & MARKS DISTRIBUTION)

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
1	Professional CoreCourse	**PCCCSE601**	Compiler Design	3	1	0	**4**	30	70	21	100	35
2	Professional Core Course	**PCCCSE602**	Graph Theory	3	1	0	**4**	30	70	21	100	35
3	Professional Elective Course	**PECCSE603**	Professional Elective II	2	0	0	**2**	30	70	21	100	35
4	Professional Elective Course	**PECCSE604**	Professional Elective III	2	0	0	**2**	30	70	21	100	35
5	Humanities and Social Science	**HSMC601**	HSS/ Management Elective I	3	0	0	**3**	30	70	21	100	35
6	Open Elective Course	**OECCSE605**	Open Elective II	2	0	0	**2**	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	Professional Elective-II Course Lab	**PECCSE651**		0	0	2	**1**	30	20		50	25

2	Professional Elective-III Course Lab	**PECCSE652**		0	0	2	**1**	30	20		50	25
3	Humanities and Social Science	**HSMC601**	ntroduction to Soft Skill	0	0	2	**1**	30	20		50	25
4	Open Elective-II Lab			0	0	2	**1**					
5	Internship	**INT601**	Internship/ Tour and Training/ Industrial Training	0	0	4	**2**	30	20		50	25
TOTAL							**23**					

Departmental Elective-II (Choose any one)
Soft Computing
Decision Support System
Distributed Computing
Mobile Application

Departmental Elective-III (Choose any one)
Distributed Database system
Data Mining

Open Elective II (Choose any one)
REMOTE SENSING AND GIS
PLC & SCADA
Microprocessors and Microcontrollers

HSS/ Management Elective I
Project Management
Operations Research
Managerial Ecconomics

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New Scheme Based on AICTE Flexible Curricula

Semester – VI

Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	Compiler Design	**PCCCSE601**

Course Objectives:

To acquaint the students with legacies of constitutional development in India and help those to understand the most diversified legal document of India and philosophy behind it. To make students aware of the theoretical and functional aspects of the Indian Parliamentary System.

UNIT - I

Introduction to Compilers and its Cousins, Structure of a Compiler, Science of building Compiler and its Application, Lexical Analyzer, Input Buffering, Specification and Recognition of Tokens, Introduction to Lex.

UNIT - II

Introduction to Syntax Analysis, Elimination of Ambiguity, Left Recursion and Left Factoring, Recursive and Non-Recursive Top-Down Parsers, Bottom-up Parsers: Shift Reduce Parser techniques and conflicts, all variants of LR Parsers, Handling Ambiguous grammar in Bottom Up Parsing, Error handling while parsing, The Parser generator YAAC.

UNIT - III

Syntax-Directed Definition (SDD), Evaluation Order of SDD's and its application, Syntax Directed Translation Schemes and their Implementation.

UNIT - IV

Intermediate code Generation: Variants of Syntax Tree, Three Address Code, Translation of Expressions, and Control flow, Back Patching, Run Time Environment: Storage Organization.

UNIT - V

Code Generation: Issues in its Design, Target Language, Addresses in Target Code, Basic Blocks and Flow Graphs, Optimization of Basic Blocks Machine Independent Optimization: Sources of Optimization, Data Flow analysis.

Text book:

1. Aho A. V., Lam M. S., Sethi R., Ullman J. D., Compilers, Principles, Techniques, andTool, 2nd Edition, Pearson Education Asia.

Reference books:

1. Fischer C. N., LeBlanc R. J., Crafting a Compiler with C, Pearson Education Asia.

Louden K. C

Course Outcomes:

At the end of course, the student will be able to:

Acquire knowledge of different phases and passes of the compiler and also able to use the compiler tools like LEX, YACC, etc. Students will also be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers.

Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table. Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes.

Acquire knowledge about run time data structure like symbol table organization and different techniques used in that.

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – VI

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Graph Theory	**PCCCSE602**

Course Objectives:

1. To understand and apply the fundamental concepts in graph theory
2. To apply graph theory based tools in solving practical problems
3. To improve the proof writing skills.

UNIT I

Introduction: Graphs and its applications, Finite and infinite graphs, incidence and degree, isolated Vertex, pendant Vertex, and Null graph, paths and circuits, isomorphism, sub graphs, walks, paths, and circuits, connected graphs, disconnected graphs and components, Connectivity checking algorithm, Euler graphs, Operations on graphs, more on Euler graphs, Hamiltonian paths and circuits,Travelling Salesman problem.

UNIT II

Trees and Fundamental circuits: Trees and its properties, Distance and centres in a tree, Algorithm for checking if a graph is Tree, Partial k-trees, Dynamic Programming in partial k trees, Spanning trees, Spanning trees in a Weighted graph, Prim's and Kruskal's algorithms Cut set and cut vertices: Properties of a cut set, Fundamental circuits and cut sets, connectivity and separability, Computing connected components, Menger's theorem, Network flows, 1- Isomorphism, 2-Isomorphism

UNIT III

Planar and Dual Graphs: Planar graph, Kuratowski's Graphs, Representations of a planar graph, Detection of planarity, Planar Separator Theorem, Geometric Dual, Combinatorial, Duel, Thickness and crossings, Algorithms for finding Clique and maximum clique.

UNIT IV

Matrix Representation of Graphs: Incidence matrix, Adjacency matrix, Adjacency list, Circuits Matrix, Fundamental Circuit Matrix and Rank of B, Cut-set Matrix, Relationships among Af, Bf and Cf, path Matrix.

UNIT V

Coloring, Covering and partitioning: Chromatic number, Chromatic partitioning, Chromatics polynomial, Coverings, Four colour problem, Algorithm for graph colouring. Directed Graphs: Digraphs and its types, Digraphs and binary Relations, Directed paths and connectedness, Euler Digraphs, Trees with Directed Edges, Fundamental Circuits in Digraphs, Matrices A,B and C of Digraphs, Adjacency Matrix of a Digraph, Paired Comparisons and Tournaments, Acyclic Digraphs and De-cyclization.

Text Books:

1. Deo Narasingh, Graph Theory with Applications to engineering and Computer Science, Prentice Hall of India, 2001.
2. Raman Tulasi and Swamy M.N.S., Graph, Networks and Algorithms, John Wiley, 1981.

Reference Books:

1. West Douglas B., Introduction to Graph theory, Pearson Education, 2002.
2. Harary F., Graph Theory, Addison Wesley/ Narosa, 1998.
3. Reingold E. M., Nievergelt J., Deo N., Combinatorial Algorithms: Theory and Practice,R.

Expected Outcome:

The students will be able to apply principles and concepts of graph theory in practical situations.

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Professional Elective II	**PECCSE603**

DISTRIBUTED COMPUTING

Course Objective:

This course is an introduction to the design of distributed systems and algorithms that support distributed computing. It aims to provide a practical exposure into the design and functioning of existing distributed systems.

Unit – I

Distributed Computing Concept: Definitions, The history of distributed computing, Different forms of computing, The strengths & weaknesses of distributed computing, Basics of operating systems, Network basics, Software engineering basics. Event synchronization, Timeouts and threading, Deadlocks, Data representation, Data marshaling, Event diagram and sequence diagram, IPv4 & IPv6, Connection – oriented versus connectionless IPC.

Unit – II

Distributed Computing Paradigms: Paradigms and Abstraction, Message Passing, The Client-Server Paradigm, the Message System Paradigm, Remote Procedure Call Model, RMI, The Distributed Objects Paradigm, The Object space, The Mobile Agent Paradigm.

Unit – III

The Socket API: The Socket metaphor in IPC, The Datagram Socket API, The Stream-Mode Socket API, Sockets with no blocking I/O Operations, Secure Socket API. The client server paradigm issuers, connection- oriented and connectionless servers, Iterative server and concurrent server, stateful server and stateless server.

Unit – IV

Distributed Objects: Remote Procedure Calls, Distributed Objected Systems, Remote Method Invocation, The Java RMI Architecture, The API for the Java RMI, RMI Security Manager, Comparison of RMI ,Remote Procedure Calls, Distributed Objected Systems, Remote Method Invocation, The Java RMI Architecture, The API for the Java RMI, RMI Security Manager, Comparison of RMI and Socket APIs.

Unit – V

Group Communication: Unicasting versus Multicasting, Multicast API, Connectionless versus Connection-oriented Multicast, Reliable Multicasting versus Unreliable Multicasting, The Java Basic Multicast API.

TEXT BOOK

1. Liu M. L., "Distributed Computing: Principles and Application", Pearson Education, 2008.

REFERENCE BOOK

1. Altiya H., Welch J., "Distributed Computing Fundamentals, Simulations and Advanced Topics", 2nd edition, Wiley – India Edition, 2006.

Course Outcomes:

At the end of the course the students will be able to understand the design principles in distributed systems and the architectures for distributed systems.

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B.Tech (Computer Science & Engineering)	Professional Elective II	**PECCSE603**

Mobile Application (MA)

Learning Objectives:

When students complete Intro to Programming with Python, they will be able to: Build basic programs using fundamental programming constructs like variables, conditional logic, looping, and functions. Work with user input to create fun and interactive programs.

Unit – I

Introduction, Developing Mobile Applications, Going Mobile, People Perspective, Mobilizing the Enterprise**.**

Unit – II

Mobile Application Architectures, Client-Server layers and Tires, Client thin and fat & web page Hosting, Server one, two and three tire architecture, Connection type with always, partially and never connect, Good Architectural Design Tenets

Unit – III

Mobile Infrastructure, Mobile Device Types, Mobile Device Components, Connection Methods

Unit – IV

Mobile Client Applications, Thin Client, Fat Client, Web Page Hosting, Best Practices

Unit – V

Mobilizing existing application architectures. Evolution of Enterprise Architectures, Anatomy of Enterprise Web Architecture, Considerations When Mobilizing Existing Applications, Types of Mobile Applications, Mobile Web Apps Versus Native Applications, Mobile Web Apps Versus Native Applications, Mobile 2.0

Text Books:

1. Schell Robbie, Schneider Heather, Lee Valentino, "Mobile Applications: Architecture, Design, and Development", Prentice Hall 2004.
2. Fling Brian, "Mobile Design and Development", O'Reilly Media, 2009.

Reference Books:

1. Mc Wherter Jeff, Gowell Scott, "Professional Mobile Application Development", John Wiley & Sons 2012.

LEARNING OUTCOMES:

1. Ability to choose appropriate data structures to represent data.
2. Ability to analyze the time and space complexities of Algorithms Understand.
3. Ability to design programs using a variety of data structures such.

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Professional Elective II	**PECCSE603**

Decision Support System

Course objectives:

The primary purpose of using a DSS is to present information to the customer in an easy-to-understand way.

A DSS system is beneficial because it can be programmed to generate many types of reports, all based on user specifications.

Introduction to DSS:

Unit-I Definition. Types of DSS. Data and Model Management. DSS Knowledge Base. User interface.The DSS user. Categories and classes of DSS.

Unit -II

Decision and Decision-makers:

Definition. Types of decision. Different levels of Decision makers in the organization and their requirement. Decision effectiveness. Simon's model of decision making. Rational decision making. Bounded rationality. Biases and heuristics in decision making.

Unit –III

Group Decision Support System (GDSS):

Group decision making. GDSS modeling. Brainstorming process. MDM support technologies. Managing MDM activities. System perspective of a DSS: DSS in the context of information system. Information quality issues in DSS design. Role of internet in DSS development.

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Unit -IV

Designing and building DSS:

Strategies for DSS analysis and design. The DSS developer. Tools for DSS development. Implementing and Integrating DSS: DSS implementation. System evaluation.

Unit-V

Intelligent Decision Support system:

The intelligence of Artificial Intelligence. Future of Expert and Artificial Intelligence. Knowledge acquisition for Expert Systems. Future of Intelligent integration. Software Agents and Delegation.

TEXT BOOK

1. Marakas George M., "Decision Support Systems in the 21st century", Pearson education.

REFERENCE BOOKS

1. Turban Efraim, "Decision Support Systems and Intelligent Systems", Pearson Education.

The learning outcomes are as follows: – An ability to perceive the characteristics of the decision models in real time or not**.** Ability to locate and select appropriate data to support decision models. Ability to analyze, investigate and evaluate a decision model.

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective III	**PECCSE604**

Distributed Database system

Course objective:

This course covers the fundamental issues of distributed databases with focus on data fragmentation and allocation, query optimization and transaction processing. Topics include: Distributed database management systems architecture and design; data fragmentation, replication, and allocation; database security, authorization and integrity control; query optimization; transaction management; distributed concurrency control and replica control; distributed object database management systems; multi data base systems.

Unit-I:

Introduction: Distributed Data Processing, What is a Distributed Database System? Promises of DDBSs, Problem Areas.

Unit-II:

Distributed DBMS Architecture: DBMS Standardization, Architectural Models for Distributed DBMSs, Distributed DBMS Architecture.

Distributed Database Design: Alternative Design Strategies, Distribution Design Issues, Fragmentation, Allocation.

Unit-III:

Overview of Query Processing: Query Processing Problem, Objectives of Query Processing, Complexity of Relational Algebra Operations, Layers of Query Processing.

Query Decomposition and Optimization: Query Decomposition, Query Optimization,

Centralized Query Optimization, Distributed Query Optimization Algorithms.

Unit -IV:

Transaction Management and Concurrency Control: Definition of a Transaction, properties of Transactions, Serializability Theory, Taxonomy of Concurrency Control Mechanisms, Locking-based Concurrency Control Algorithms, Timestamp-based Concurrency Control Algorithms, Deadlock Management.

Unit -V:

Distributed DBMS Reliability: Reliability Concepts and Measures, Failures and Fault Tolerance in Distributed Systems, Failures in Distributed DBMS, Local Reliability Protocols, Distributed Reliability Protocols.

TEXT BOOK

1. OzsuM. Tamer, ValduriezPatrick, "Distributed Database Systems", 2nd Edition, Pearson, 2011.

REFERENCE BOOKS

1. Navathe Elmasri, "Fundamental of Database Systems", 5th Edition, Pearson Education, 2008.

2. Connolly Thomas, Begg Carolyn, "Database Systems – A Practical Approach to Design, implementationand Management", 4th Edition, Pearson Education, 2008.

3. Silberschatz, Korth, & Sudarshan, "Database System Concepts", 4th Edition, McGraw Hill, 2002.

Course Learning Outcomes:

Understand distributed database systems architecture and design. Be able to apply methods and techniques for distributed quay processing and optimization. Understand the broad concepts of distributed transaction process. Understand the basic concepts of Data warehousing and OLAP technology.

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Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	Professional Elective III	**PECCSE604**

Data Mining

Course Objective:

This course will introduce the concepts of data ware house and data mining, which gives a complete description about the principles, used, architectures, applications, design and implementation of data mining and data ware housing concepts.

Unit – I

Introduction: What is data mining? Motivating challenges. The origins of data mining. Data mining tasks. Data: Types of Data. Attributes and Measurement. Types of Data Sets. Data Quality Measurement and Data Collection Issues.

Unit – II

Measures of Similarity and Dissimilarity: Basics. Similarity and Dissimilarity between Simple Attributes. Dissimilarities between Data Objects. Similarities between Data Objects. Examples of Proximity Measures. Issues in Proximity Calculation. Selecting the Right Proximity Measure.

Unit – III

Association Analysis: Basic Concepts and Algorithms Preliminaries. Frequent Itemset Generation. The Apriori Principle. Frequent Itemset Generation in the Apriori Algorithm. Candidate Generation and Pruning Support Counting. Rule Generation.

Unit – IV

Cluster Analysis: Basic Concepts and Algorithms. What Is Cluster Analysis? Different Types of Clustering. Different Types of Clusters. K-means. Basic K-means Algorithm. Basic Agglomerative

Hierarchical Clustering Algorithm. Key Issues in Hierarchical Clustering. The DBSCAN Algorithm.

Unit – V

Classification: Basic Concepts and Techniques. General Framework for Classification. Decision Tree Classifier. A Basic Algorithm to Build a Decision Tree. Methods for Expressing Attribute Test Conditions. Measures for Selecting an Attribute Test Condition. Algorithm for Decision Tree Induction. Characteristics of Decision Tree Classifiers. Model Evaluation.

TEXT BOOK

1. Tan Pang-Ning, Steinbach Michael, and Kumar Vipin , "Introduction to Data Mining", Pearson Education, New Delhi.

REFERENCE BOOKS

1. Han Jiawei & Kamber Micheline, "Data Mining Concepts & Techniques", Publisher Harcourt India. Private Limited, Second Edition
2. Dunham H.M. & Sridhar S., "Data Mining", Pearson Education, New Delhi, 2006.

COURSE OUTCOME:

1 Understand the functionality of the various data mining and data warehousing component.

2 Appreciate the strengths and limitations of various data mining and data warehousing models.

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Professional Elective III	**PECCSE603**

Course objectives:

Soft Computing

The main objective of the course is ***to expose the students to soft computing, various types of soft computing techniques, and applications of soft computing***. .

Unit – I

Fuzzy Set Theory: Basic Definition and Terminology, Set Theoretic Operations, Fuzzy types and levels, MF Formulation and Parameterization, MF of two dimensions, Fuzzy Union, Intersection and Complement, Fuzzy Number, Fuzzy measure.

Unit – II

Fuzzy Logic: Fuzzy Rules and Fuzzy Reasoning: Extension Principles and Fuzzy Relations, Fuzzy IF THEN Rules, Defuzzification, Fuzzy Reasoning. Fuzzy Inference System: Introduction, Mamdani Fuzzy Models, Other Variants, Sugeno Fuzzy Models, Tsukamoto Fuzzy Models.

Unit – III

Fundamentals of Genetic Algorithms: Basic Concepts, Creation of Offsprings, Encoding, Fitness Functions, Reproduction, Genetic Modelling: Inheritance Operators, Cross over, Inversion and detection, Mutation operator, Bitwise operators.

Unit – IV

Introduction to Artificial Neural Networks: What is a Neural Network? Human Brain, Models of

Neuron, Neural Network viewed as Directed Graphs, Feedback, Network **Architecture,** Knowledge Representation, Learning processes: (Error correction, Memory-Based, Hebbian , Competitive, Boltzman , Supervised, Unsupervised), Memory, Adaptation.

Unit – V

Perceptrons, Adaline, Back Propagation Algorithm, Methods of Speeding, Convolution Networks, Radical Basis Function Networks, Covers Theorem, Interpolation Learning, The Hopfield Network.

Text Books:

1. Jang J.S.R., Sun C.T. and Mizutani E., "Neuro-Fuzzy and Soft Computing" PHI/Pearson Education, New Delhi, 2004.
2. Rajasekaran S. & Vijayalakshmi, G.A. Pai, "Neural Networks, Fuzzy Logic, and Genetic Algorithms: Synthesis and Applications", PHI, New Delhi, 2003.
3. Ross T. J., "Fuzzy Logic with Engineering Applications", TMH, New York, 1997.
4. Haykins Simon, "Neural Networks: A Comprehensive Foundation", Pearson Education,2002.

Reference Books:

1. Ray K.S., "Soft Computing and Its application", Vol 1, Apple Academic Press.2015.
2. Lee K.H., "First Course on Fuzzy Theory and App.", Adv in Soft Computing Spinger.2005.
3. Zimmermann H.Z., "Fuzzy Set Theory and its App", 4thEdition, Spinger Science

Course Outcomes:

At the end of the course the student should be able to

1. Learn about soft computing techniques and their applications
2. Analyze various neural network architectures
3. Understand perceptrons and counter propagation networks.
4. Define the fuzzy systems
5. Analyze the genetic algorithms and their applications.

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	HSS/Management Elective I	**HSMC601**

Project Management

Objective:

To facilitate the understanding of project management principles and processes

Contents:

Module- I

Introduction: Introduction to Project Management, definitions, History of Project Management, projectidentifications, establishing a project, Project Life Cycle.

Module- II

Project Analysis: Facets of Project Analysis, Resource Allocation, Market Analysis, Technical Analysis,Economic and Ecological Analysis.

Module- III

Financial Analysis: Financial Estimates and Projections, Investment Criteria, Financing of Projects.

Module- IV

Network Methods in PM: Origin of Network Techniques, AON and AOA differentiation, CPM network, PERTnetwork, Other network models.

Module- V

Optimisation in PM: Time and Cost trade-off in CPM, Crashing procedure, Scheduling when resources arelimited.

Module- VI

Project Risk Management: Risk analysis, Work Breakdown Structure, Earned Value Management.

Course Outcomes:

At the end of the course, the student will be able to:

1. Understand the importance of projects and its phases.
2. Analyze projects from marketing, operational and financial perspectives.
3. Evaluate projects based on discount and non-discount methods.
4. Develop network diagrams for planning and execution of a given project.
5. Apply crashing procedures for time and cost optimization.

Text Books:

1. Prasanna Chandra, Project: A Planning Analysis, Tata McGraw Hill Book Company, New Delhi, 4th Edition, 2009.
2. Cleland, Gray and Laudon, Project Management, Tata McGraw Hill Book Company, New Delhi, 3rd Edition, 2007.
3. Jack R. Meredith., Samuel J. Jr. Mantel., Project Management - A Managerial Approach, John Wiley, 6th Edition, 2011.

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	HSS/Management Elective I	**HSMC601**

Operations Research

Course Description and Objectives:

The course aims at building capabilities in the students for analyzing different situations in the industrial/ business scenario involving limited resources and finding the optimal solution within constraints. The objective of this course is to enable the student to understand and analyses managerial and engineering problems to equip him to use the resources such as capitals, materials, productions, controlling, directing, staffing, and machines more effectively.

Module-I

Introduction: Scope and limitations of O.R., Linear Programming: Mathematical formulation of the problem. Graphical solution and Simplex Method.

Module-II

Linear Programming: Big-M Method, Concept of duality, Dual simplex method.

Module-III

Transportation Model: Basic feasible solution by different methods, Finding optimal solutions, Degeneracy in transportation problems, Unbalanced transportation problems. Assignment Model: Balanced and unbalanced assignments, Assignment to given schedules.

Module-IV

Sequencing: Processing of 2 jobs through machines –graphical method, Processing of n jobs through two machines, processing n jobs through threemachines.

Module-V

Games Theory: Two-persons zero sum games, Pure and mixed strategies, Rules of dominance,

Solution methods without saddle point.

Module-VI

Queuing Model: Queuing systems and their characteristics, The M/M/1/FIFO/ system, Introduction to dynamic programming.

Text Books:

1. P. Rama Murthy , Operations Research, New Age, New Delhi
2. P.K. Gupta & D. S. Hira, Operations Research, S. Chand & Company Ltd, New Delhi.

References Books:

1. Hamdy A Taha, 1999. Introduction to Operations Research, PHI Limited, New Delhi.
2. Sharma, J.K., 1989. Mathematical Models in Operations Research, Tata McGraw Hill publishing Company Ltd., New Delhi. Beer, Stafford, 1966. Decision and Control, John Wiley & Sons, Inc., New York.

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes:

1. Solve linear programming problems using appropriate techniques and optimization solvers, interpret the results obtained.
2. Determine optimal strategy for Minimization of Cost of shipping of products from source to Destination/ Maximization of profits of shipping products using various methods, Finding initial basic feasible and optimal solution of the Transportation problems
3. Optimize the allocation of resources to Demand points in the best possible way using various techniques and minimize the cost or time of completion of number of jobs by number of persons.
4. Model competitive real-world phenomena using concepts from game.

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	HSS/Management Elective I	**HSMC601**

Managerial Economics

Course Objectives This course enables the students:

A. To explain the basics of economics and describe its application in managerial problems.

B. To demonstrate the effect of demand and cost on business decisions and make a relation between cost and production.

C. To analyses different types of market and explain pricing decisions in the markets.

D. To familiarize the concept of investment criteria. .

E. To explain the concept of national income and analyses for managerial decisions.

Course Outcomes After the completion of this course, students will be:

1. Analyze economic problems and can correlate scarcity with the requirements.
2. Evaluate demand and can analyses cost in order to optimize cost-production combination.
3. Recognize the existing market and can take appropriate decisions. 4. Evaluate the investment criteria and canframe appropriate plan.
4. Analyze national income components for effective economic decisions.

Syllabus:

Module 1: Introduction: Nature and scope, Definitions, Importance, Application to Business Decisions, Profit Maximization as Business Objectives, Sales and Revenue Maximization Objective

of Business Firms.

Module2: Demand and Supply Introduction, Determinants of Demand and Supply, Demand Function, Demand and Supply Curves, Law of Demand, Elasticity of Demand, Demand Forecasting,

Module3: Production Analysis and Cost Classification of Cost, Cost-Output Relationship, Economies of Scale, Break- even Analysis Production Process and Function-One Variable and Two Variable Inputs, Iso-quant and Iso-cost, Optimal Factor Combination.

Module4: Market Introduction, Market Types- Perfect Competition, Imperfect Competition, Monopoly and Oligopoly- Price Leadership Model, Collusive Oligopoly and Kinked Demand Curve Model, Equilibrium of a Firm under Perfect Competition, Price Determination under Different Markets

Module5: Capital Budgeting & National Income Introduction, Meaning and Significance of Capital Budgeting, Methods of Investment Appraisal, Concept of National Income, Measurement of National Income- Methods and Problems.

Text Books

1. Managerial Economics, Atman and, Excel Books

2. Managerial Economics, H. Craig Petersen & W. Cris Lewis, Pearson Education.

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Course Content

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B.Tech. (Computer Science &Engineering)	Open Elective II	**OECCSE605**

Objectives:

Mechatronics, Robotics & Control

1. Model and analyze mechatronic systems for an engineering application
2. Identify sensors, transducers and actuators to monitor and control a process or product.
3. Develop PLC programs for an engineering application.
4. Evaluate the performance of mechatronic systems.

Contents

Module I: Introduction: Electro-mechanical systems; Typical applications; Examples – automobiles, home appliances, medical instruments, etc.

Module II: Sensors: Transduction principles; Sensitivity, accuracy, range, resolution, noise sources; Sensors for common engineering measurements – proximity, force, velocity, temperature, etc.; Signal processing and conditioning; Selection of sensors.

Module III: Actuators: Pneumatic and hydraulic actuators; Electric motors including DC, AC, BLDC, servo and stepper motors; Solenoids and relays; Active materials – piezoelectric and shape memory alloys.

Module IV: Machine Controls: Microprocessors and their architecture; Memory and peripheral interfacing; Programming; Microcontrollers; Programmable Logic Controllers; PLC principle and operation; Analog and digital input/output modules; Memory module; Timers, internal relays, counters and data handling; Industrial automation systems; Basic PLC programming; Industry kits (Arduino, Raspberry Pi, etc.).

Module V: Robotics: Robot configurations: serial and parallel; Denavit–Hartenberg parameters;

Manipulators kinematics; Rotation matrix, Homogenous transformation matrix; Direct and inverse Kinematics for robot position and orientation; Workspace estimation and path planning; Robot vision; Motion tracking; Robot programming and control; Industrial robots - Pick and place robots, sorting, assembly, welding, inspection, etc.

Module VI: Control Theory and Systems: Basic control concepts; Feedback; Open and closed loop control; Concept of block diagrams; P, PI and PID controllers; Tuning the gain of controllers; System models, transfer functions, system response, frequency response; Root Locus method and Bode plots.

Module VII: Computational Tools: Demonstration and projects using simulation software (e.g., Matlab, Scilab, ROBODK) for control systems and robotics.

Text /Reference Books:

1. W. Bolton, "Mechatronics," Addison Wesley Longman, 2010.
2. J. J. Craig, Introduction to Robotics Mechanics and Control, Addison Wesley, 1999.
3. G.K. McMillan, "Process/Industrial Instruments and Controls Handbook," McGraw-Hill,1999.
4. S. Mukherjee, "Essentials of Robotics Process Automation", Khanna Book Publishing, 2021.

Online Resources:

1. https://nptel.ac.in/courses/107/106/107106090/
2. https://nptel.ac.in/courses/112/101/112101098/
3. https://nptel.ac.in/courses/112/107/112107289/
4. https://nptel.ac.in/courses/112/104/112104298/

Course Outcomes:

At the end of this course students will demonstrate the ability to

1. Ability to recognize and analyze electro-mechanical systems in daily lives.
2. Understand the role of sensors, actuators, and controls in mechatronic systems.
3. Understand the basic theory of robot kinematics.
4. Familiarity with control theory and controller design.
5. Understand the measurement of various quantities using instruments, their accuracy & range, and the techniques for controlling devices automatically.

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Course Content

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B.Tech. (Computer Science &Engineering)	Open Elective II	**OECCSE605**

Course Outcomes:

Microprocessors and microcontrollers

At the end of this course, students will demonstrate the ability to

1. Do assembly language programming.
2. Do interfacing design of peripherals like I/O, A/D, D/A, timer etc.
3. Develop systems using different micro controllers.

Module 1: Fundamentals of Microprocessors: (7 Hours)

Fundamentals of Microprocessor Architecture. 8-bit Microprocessor and Microcontroller architecture, Comparison of 8- bit microcontrollers, 16-bit and 32-bit microcontrollers. Definition of embedded system and its characteristics, Role of microcontrollers in embedded Systems. Overview of the 8051 family.

Module 2 : The 8051 Architecture (8 Hours)

Internal Block Diagram, CPU, ALU, address, data and control bus, Working registers, SFRs, Clock and RESET circuits, Stack and Stack Pointer, Program Counter, I/O ports, Memory Structures, Data and Program Memory, Timing diagrams and Execution Cycles.

Module 3: Instruction Set and Programming (8 Hours)

Addressing modes: Introduction, Instruction syntax, Data types, Subroutines Immediate addressing, Register addressing, Direct addressing, Indirect addressing, Relative addressing, Indexed addressing, Bit inherent addressing, bit direct addressing. 8051 Instruction set, Instruction timings. Data transfer instructions, Arithmetic instructions, Logical instructions, Branch instructions, Subroutine instructions, Bit manipulation instruction. Assembly language programs, C language

programs. Assemblers and compilers. Programming and debugging tools.

Module 4: Memory and I/O Interfacing (6 Hours):

Memory and I/O expansion buses, control signals, memory wait states. Interfacing of peripheral devices such as General Purpose I/O, ADC, DAC, timers, counters, memory devices.

Module 5: External Communication Interface (6 Hours)

Synchronous and Asynchronous Communication. RS232, SPI, I2C. Introduction and interfacing to protocols like Blue-tooth and Zig-bee.

Module6: Applications (06 Hours)

LED, LCD and keyboard interfacing. Stepper motor interfacing, DC Motor interfaces, sensor interfacing.

Text / References:

1. M. A.Mazidi, J. G. Mazidi and R. D. McKinlay, "The 8051Microcontroller and Embedded Systems: Using Assemblyand C", Pearson Education,2007.
2. K.J.Ayala,"8051Microcontroller",DelmarCengageLearning,2004.
3. R. Kamal, "Embedded System", McGraw HillEducation,2009.
4. R. S. Gaonkar, ", Microprocessor Architecture: Programming and Applications with the 8085", PenramInternational Publishing, 1996.

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Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	Open Elective II	**OECCSE605**

Remote Sensing and GIS

COURSE OBJECTIVES:

i. Apply the concepts of Photogrammetry and its applications such as determination of heights of objects on terrain.

ii. ii. Understand the basic concept of Remote Sensing and know about different types of satellite and sensors.

iii. iii. Illustrate Energy interactions with atmosphere and with earth surface features, Interpretation of satellite and top sheet maps

iv. iv. Understand different components of GIS and Learning about map projection and coordinate system

v. v. Develop knowledge on conversion of data from analogue to digital and working with GIS.

Module I

Remote Sensing: Definition and Development; Platforms and Types; Photogrammetry.

Module II

Satellite Remote Sensing: Principles, EMR Interaction with Atmosphere and Earth Surface; Satellites (Landsat andIRS); Sensors

Module III

Geographical Information System (GIS): Definition and Components.

Module IV

Global Positioning System (GPS) – Principles and Uses; DGPS.

Module V

GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure.

Reference Books:

1. Bhatta , B. (2008) Remote Sensing and GIS, Oxford University Press, New Delhi.
2. Campbell J. B., 2007: Introduction to Remote Sensing, Guildford Press
3. Jensen, J. R. (2005) Introductory Digital Image Processing: A Remote Sensing.
4. Bhatta, B. (2010) Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg.41

COURSE OUTCOMES:

After completing this course the student will have acquired the ability on the following.

1. Understand the concepts of Photogrammetry and compute the heights of objects
2. Understand the principles of aerial and satellite remote sensing, Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies.
3. Understand the basic concept of GIS and its applications, know different types of data representation in GIS
4. Understand and Develop models for GIS spatial Analysis and will be able to know what the questions that GIS can answer are
5. Apply knowledge of GIS software and able to work with GIS software in various application fields
6. Illustrate spatial and non-spatial data features in GIS and understand the map projections and coordinates systems
7. Apply knowledge of GIS and understand the integration of Remote Sensing and GIS

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Semester – VI

Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	Open Elective II	**OECCSE605**

PLC & SCADA

COURSE OBJECTIVES:

To get familiar with industrial automation working with PLC and SCADA

Module I

Programmable Logic Controllers: Introduction, Parts of a PLC, Principles of Operation, Modifying the Operation, PLCs versus Computers, PLC Size and Application. PLC Hardware Components: The I/O Section, Discrete I/O Modules, Analog I/O Modules, Special I/O Modules, I/O Specifications, The Central Processing Unit (CPU), Memory Design, Memory Types, Programming Terminal Devices, Recording and Retrieving Data, Human Machine Interfaces (HMIs). Basics of PLC Programming: Processor Memory Organization, Program Scan, PLC Programming Languages, Relay- Type Instructions, Instruction Addressing, Branch Instructions, Internal Relay Instructions, Programming Examine If Closed and Examine If Open Instructions, Entering the Ladder Diagram, Modes of operation

Module II

Developing Fundamental PLC Wiring Diagrams and Ladder Logic Programs: Electromagnetic Control Relays, Contactors, Motor Starters, Manually Operated Switches, Mechanically Operated Switches, Sensors, Output Control Devices, Seal-in Circuits, Latching Relays, Converting Relay Schematics into PLC Ladder Programs, Writing a Ladder Logic Program Directly from a Narrative Description. Programming Timers: Mechanical Timing Relays, Timer Instructions, On-Delay Timer Instruction, Off-Delay Timer Instruction, Retentive Timer, Cascading Timers.

Module III

SCADA Fundamentals: Introduction, Open system: Need and advantages, Building blocks of SCADA systems, Remote terminal unit (RTU): Evolution of RTUs, Components of RTU, Communication subsystem, Logic subsystem, Termination subsystem,

Module IV

Human-Machine Interface (HMI): HMI components, HMI software functionalities, Situational awareness, Intelligent alarm filtering: Need and technique, Alarm suppression techniques, Operator needs and requirements,

Module V

SCADA Systems: Building the SCADA systems, legacy, hybrid, and new systems, Classification of SCADA systems, SCADA implementation: A laboratory model: The SCADA laboratory, System hardware, System software, SCADA lab field design.

Text Books:

1. Programmable Logic Controllers Frank D Petruzella McGraw Hill 4th Edition, 2011
2. Power System SCADA and Smart Grids Mini S. Thomas CRC Press 3rd Edition,2015

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Semester – VI

Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science & Engineering)	Professional Elective-II Course Lab	**PCCCSE651**

Distributed Computing Lab

EXPERIMENT-1 Implement concurrent echo client-server application

EXPERIMENT-2 Implement concurrent day-time client-server application.

EXPERIMENT-3 Configure following options on server socket and tests them: SO_KEEPALIVE, SO_LINGER, SO_SNDBUF, SO_RCVBUF, TCP_NODELAY

EXPERIMENT-4 Incrementing a counter in shared memory. EXPERIMENT-5 Create CORBA based server-client application EXPERIMENT-6 Design XML Schema and XML instance document

EXPERIMENT-7 WSDL based: Implement Arithmetic Service that implements add, and subtract operations / Java based: Implement Trigonometric Service that implements sin, and cos operations

EXPERIMENT-8 Configuring reliability and security options

EXPERIMENT-9 Monitor SOAP request and response packets. Analyze parts of it and compare them with the operations (java functions) headers

EXPERIMENT-10 Design and test BPEL module that composes Arithmetic Service and Trignometric Service. EXPERIMENT-11 Test open source ESB using web service.

LABWORK BEYOND CURRICULA

EXPERIMENT-12 Implementing Publish/Subscribe Paradigm using Web Services, ESB and JMS

EXPERIMENT-13 Implementing State ful grid services using Globus WS-Core-4.0.3

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Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	Professional Elective-II Course Lab	**PCCCSE651**

LIST OF LAB EXPERIMENTS:

1. Develop an application that uses GUI components, Font and Colors.
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multi threading.
8. Develop a native application that uses GPS location information.
9. Implement an application that writes data to the SD card.
10. Implement an application that creates an alert upon receiving a message.
11. Write a mobile application that creates alarm clock.

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Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science & Engineering)	Professional Elective-III Course Lab	**PCCCSE652**

Soft Computing Lab

1. Create a perceptron with appropriate number of inputs and outputs. Train it using fixed increment learning algorithm until no change in weights is required. Output the final weights.
2. Write a program to implement artificial neural network without back propagation. Write a program to implement artificial neural network with back propagation.
3. Implement Union, Intersection, Complement and Difference operations on fuzzy sets. Also create fuzzy relation by Cartesian product of any two fuzzy sets and perform max- min composition on any two fuzzy relations.
4. Implement travelling sales person problem (tsp) using genetic algorithms.
5. Plot the correlation plot on dataset and visualize giving an overview of relationships among data on soya bins data. Analysis of covariance: variance (ANOVA), if data have categorical variables on iris data.
6. Implement linear regression and multi-regression for a set of data points
7. Implement crisp partitions for real-life iris dataset
8. Write a program to implement Hebb's rule Write a program to implement Delta rule.
9. Write a program to implement logic gates.
10. Implement svm classification by fuzzy concepts

Reference Books:

1. D.K Prathikar, ―Soft Computing‖, Narosa Publishing House, New Delhi, 2008.

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Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science & Engineering)	Professional Elective-III CourseLab	**PCCCSE652**

Data Mining Laboratory

1. Demonstration of preprocessing on dataset student.
2. Demonstration of preprocessing on dataset labor.
3. Demonstration of Association rule process on dataset contact lenses.arff using apriori algorithm
4. Demonstration of Association rule process on dataset test.arff using apriori algorithm
5. Demonstration of classification rule process on dataset student.arff using j48 Algorithm
6. Demonstration of classification rule process on dataset employee.arff using j48 algorithm
7. Demonstration of classification rule process on dataset employee.arff using id3 algorithm
8. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm
9. Demonstration of clustering rule process on dataset iris.arff using simple k-means
10. Demonstration of clustering rule process on dataset student.arff using simple kmean

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Semester – VI

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective-III CourseLab	**PCCCSE652**

Distributed Database System Lab

1. Introduction SQL-SQL*Plus
2. Road way travels E-R Diagrams
3. Various Data Types
4. Tables
4 .My SQL Installation
5 .DDL and DML Commands with Examples
7. Key Constrains-Normalization
8. Aggregate functions9 .Joins
10. Views 11 .Index 12.PL/ SQL
13. Exception handling
14. Triggers
15. Cursors
16. Subprograms-procedure PL/ SQL
17. Functions of PL/ SQL
18. Extra-programs

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Introduction to Soft Skill	**HSMC601**

Course Objectives to encourage the all-round development of students by focusing on soft skills.

 To make the engineering students aware of the importance, the role and the content of soft skills through instruction, knowledge acquisition, demonstration and practice. To develop and nurture the soft skills of the students through individual and group activities. To expose students to right attitudinal and behavioral aspects and to build the same through activities

Soft skill development

Module-I: Speaking skill, **Module-II:** Introduction to Group discussion, **Module-III:** Process of Group Discussion, **Module-IV:** Leadership skill

Module-V: Instant public speaking

Suggested books:

Course Outcomes:

1. Contemporary English Grammar Structures and Composition; David Green, Macmillan
2. English Grammar and composition; R. C. Jain, Macmillan
3. Effective Technical Communication; M. Ashraf Rizvi, Tata McGraw Hill Companies
4. Developing Communication Skills; Krushna Mohan, Meera Baneji, Macmillan

On completion of the course, student will be able to– Effectively communicate through verbal/oral communication and improve the listening skills Write precise briefs or reports and technical documents, Actively participate in group discussion / meetings / interviews and prepare & deliver presentations . Become more effective individual through goal/target setting, self-motivation and practicing creative thinking. Function effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.

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Semester – VI

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	Open Elective-II Lab	**OECCSE655**

Microprocessors and microcontrollers LAB

List of experiments (expandable)

1. Store data in memory location and registers in 8085
2. Store data in memory location and registers in 8085
3. ALP of addition of two numbers in 8085/8086/8051
4. ALP of addition of two numbers in 8085/8086/8051
5. Programming using Kiel C51 software

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Semester – VI

Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	Internship/ Tour and Training/ Industrial Training	**INT601**

Note- A student can be allowed to do the project outside after the permission of Departmental Academic Committee.

1. Those who are doing project outside but within the same city has to present their project progress every month.
2. Those who are doing project outside the city can be permitted to present their project progress every fortnightthrough video conferencing.
3. Those who are doing project at home, has to present their project progress every week.

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Choice Based Credit System Semester

Semester – VII

B. TECH IN COMPUTER SCIENCE AND ENGINEERING

(COURSE SCHEME & MARKS DISTRIBUTION)

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
				L	T	P		Internal	External		Total	
								Max	Max	Min	Max	Min
1	ProfessionalCore Course	PCCCSE701	Cryptography & Network Security	3	1	0	4	30	70	21	100	35
2	Professional Elective Course	PECCSE702	ProfessionalElective IV	2	0	0	2	30	70	21	100	35
3	Professional Elective Course	PECCSE703	ProfessionalElective V	2	0	0	2	30	70	21	100	35
4	Open ElectiveCourse	OECCSE704	Open Elective III	3	0	0	3	30	70	21	100	35
5	Humanities andSocial Science	HSMC 701	Industrial Psychology	3	0	0	3	30	70	21	100	35
PRACTICAL DEMONSTRATION												
1	**Project**	PROJEEE701	Project-I	0	0	8	4	30	20	10	50	25
2	**Professional Elective Course-IV Lab**	PCCCSE755		0	0	2	1	30	20	10	50	25
3	**Professional Elective Course-V Lab**	PCCCSE751		0	0	2	1	30	20	10	50	25
4	**Seminar**	SEM756	Seminar	2			1	30	20	10	50	25
TOTAL							21					

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Professional Elective-IV (Choose any one)
Machine Learning
Cyber Forensics
Artificial Intelligence

Open Elective III (choose any one)
Auto CAD
Electrical Machine Design

Professional Elective-V (Choose any one)
.NET Programming
Internet of Things

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Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	Cryptography & Network Security	PCCCSE701

COURSE OBJECTIVES:

1. To understand basics of Cryptography and Network Security. 2. To be able to secure a message over insecure channel byvarious means. 3. To learn about how to maintain the Confidentiality, Integrity and Availability of a data. 4. To understand various protocols for network security to protect against the threats in the network.

UNIT I

Introduction to Cryptography: Computer Security concepts, The OSI Security Architecture, Security Attacks, Security Services, A model for Network Security, Classical Encryption Techniques.

UNIT II

Mathematical Foundations of Cryptography: Modular Arithmetic, Euclidean Algorithm, Groups, Rings, Fields, Finite Fields of the Form GF(p), Polynomial Arithmetic, Finite Fields of the Form GF(2n), Prime Numbers, Fermat's and Euler's Theorem, The Chinese Remainder Theorem, Quadratic Congruence, Discrete Logarithms.

UNIT III

Symmetric and Asymmetric Cryptography: Difference Between Symmetric and Asymmetric Cryptography, DES, Triple DES, AES, RSA Cryptosystem, Symmetric and Asymmetric Key Cryptography Together, Elgamal Cryptosystem, Elliptic Curve Cryptosystems, , Diffie-Hellman Page 346 of 439 Key Exchange , Cryptographic Hash Functions, Message Authentication Codes, Digital Signature.

UNIT IV

Internet Security Protocols : Basic Concepts, Security Socket Layer (SSL), Secure Hyper Text Transfer Protocol (SHTTP), Time stamping Protocol(TSP), Secure Electronic Transaction(SET),SSL Versus SET, 3-D Secure Protocol, Electronic Money, Email Security, Wireless Application Protocol (WAP) Security, Security in GSM.

UNIT V

Network Security: Users, Trusts and Trusted Systems, Buffer Overflow and Malicious Software, Malicious Programs, Worms, Viruses, Intrusion Detection Systems (IDS), Firewalls: Definitions, Constructions and Working Principle.

Text Book:

1. Forouzan B. A., Mukhopadhyay D., "Cryptography and Network Security", 3rd Edition, Mcgraw Higher Education, 2016.

Reference Books:

1. Stallings W., "Cryptography and Network Security: Principles and Practice", 7th Edition, Pearson, 2017.

2. Kahate A., "Crptography and Network Security", 3rd Edition, McGraw Hill Education, New Delhi, 2013.

3. Schneier B., "Applied Cryptogaphy: Protocols, Algorithms And Source Code In C", 2nd Edition, Wiley, 2007.

OUTCOMES:

After successful completion of the course, the learners would be able to

1. Provide security of the data over the network.
2. Do research in the emerging areas of cryptography and network security.
3. Implement various networking protocols. 4. Protect any network from the threats in the world.

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Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective IV	PECCSE702

Objectives:

Machine Learning

The primary purpose of machine learning is to discover patterns in the user data and then make predictions based on these and intricate patterns for answering business questions and solving business problems.

UNIT I

Introduction to Machine learning Machine Learning – what and why? Basics of Linear Algebra and Statistics, Overview of target function representations; Linear Regression.

UNIT II

Supervised Learning Basics of Feature Selection and Evaluation, Decision Tree, Overfitting and Pruning, Page 238 of 439 Logistic regression, Support Vector Machine and Kernel; Noise, bias-variance trade-off, under-fitting and over-fitting concepts.

UNIT III

Neural Networks Perceptions: representational limitation and gradient descent training. Multilayer networks and back propagation. Hidden layers and constructing intermediate, distributed representations. Over fitting, learning network structure, recurrent networks.

UNIT IV

Unsupervised and Semi Supervised Learning from unclassified data. Clustering. Hierarchical Agglomerative Clustering. K means partitioned clustering. Expectation maximization (EM) for soft clustering. Semi supervised learning with EM using labelled and unlabeled data.

UNIT V

Ensemble Committees of multiple hypotheses, bagging, boosting, active learning with ensembles,

Text book:

1. Mitchell Tom, Machine Learning, Latest Edition, Mc- Graw Hill.

Reference books:

1. Shalev- Shwartz Shai and Ben-David Shai, Understanding Machine Learning, Cambridge University Press. 2017.
2. Bishop Christopher, Pattern Recognition and Machine Learning, Springer, 2006.

Learning outcomes

Understand a wide variety of learning algorithms. Understand how to evaluate models generated from data. Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

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Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective IV	PECCSE702

CYBER FORENSICS

OBJECTIVES:

- To learn computer forensics
- To become familiar with forensics tools
- To learn to analyze and validate forensics data

UNIT I

INTRODUCTION TO COMPUTER FORENSICS

Introduction to Traditional Computer Crime, Traditional problems associated with Computer Crime. Introduction to Identity Theft & Identity Fraud. Types of CF techniques - Incident and incident response methodology - Forensic duplication and investigation. Preparation for IR: Creating response tool kit and IR team. - Forensics Technology and Systems - Understanding Computer Investigation – Data Acquisition.

UNIT II

EVIDENCE COLLECTION AND FORENSICS TOOLS

Processing Crime and Incident Scenes – Working with Windows and DOS Systems. Current Computer Forensics Tools: Software/Hardware Tools.

UNIT III

ANALYSIS AND VALIDATION

Validating Forensics Data – Data Hiding Techniques – Performing Remote Acquisition – Network

Forensics – Email Investigations –Cell Phone and Mobile Devices Forensics

UNIT IV

ETHICAL HACKING

Introduction to Ethical Hacking - Foot printing and Reconnaissance - Scanning Networks - Enumeration - System Hacking - MalwareThreats - Sniffing

UNIT V ETHICAL HACKING IN WEB

Social Engineering - Denial of Service - Session Hijacking - Hacking Web servers - Hacking Web Applications – SQL Injection -Hacking Wireless Networks - Hacking Mobile Platforms.

OUTCOMES: At the end of the course, the student should be able to:

- Understand the basics of computer forensics
- Apply a number of different computer forensic tools to a given scenario
- Analyze and validate forensics data
- Identify the vulnerabilities in a given network infrastructure
- Implement real-world hacking techniques to test system security

TEXT BOOKS:

1. Bill Nelson, Amelia Phillips, Frank Enfinger, Christopher Steuart, ―Computer Forensics and Investigations‖, Cengage Learning,India Edition, 2016.
2. CEH official Certfied Ethical Hacking Review Guide, Wiley India Edition, 2015.

REFERENCES

1. John R. Vacca, ―Computer Forensics‖, Cengage Learning, 2005
2. MarjieT. Britz, ―Computer Forensics and Cyber Crime‖: An Introduction‖, 3rd Edition, Prentice Hall, 2013.

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R.K.D.F. UNIVERSITY, RANCHIDepartment of Computer Science & Engineering New Scheme Based on AICTE Flexible Curricula

Semester – VII

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective IV	PECCSE702

Course Content

Artificial Intelligence

Objectives:

The objective of general AI is to design a system capable of thinking for itself just like humans do. Currently, general AI is still under research, and efforts are being made to develop machines that have enhanced cognitive capabilities.

UNIT I

Introduction: Overview of Artificial Intelligence- Problems of AI, AI Technique, Tic - Tac - Toe Problem. Intelligent Agents: Agents & Environment, Nature Of Environment, Structure Of Agents, Goal Based Agents, Utility Based Agents, Learning Agents. Problem Solving: Problems, Problem Space & Search: Defining The Problem As State Space Search, Production System, Problem Characteristics, Issues In The Design Of Search Programs.

UNIT II

Search Techniques: Solving Problems By Searching, Problem Solving Agents, Searching For Solutions; Uniform Search Strategies: Breadth First Search, Depth First Search, Depth Limited Search, Bi-directional Search, Comparing Uniform Search Strategies. Heuristic Search Strategies: Greedy Best-First Search, A* Search, Memory Bounded Heuristic Search: Local Search Algorithms & Optimization Problems: Hill Climbing Search, Simulated Annealing Search, Local Beam Search, Genetic Algorithms; Constraint Satisfaction Problems, Local Search For Constraint Satisfaction Problems. Adversarial Search: Games, Optimal Decisions & Strategies in Games, the Mini MaxSearch Procedure, Alpha-Beta Pruning, Additional Refinements, Iterative Deepening.

UNIT III

Knowledge & Reasoning: Knowledge Representation Issues, Representation & Mapping, Approaches to Knowledge Representation, Issues in Knowledge Representation. Using Predicate Logic: Representing Simple Fact in Logic, Representing Instant & ISA Relationship, Computable Functions & Predicates, Resolution, and Natural Deduction. Representing Knowledge Using Rules: Procedural Verses Declarative Knowledge, Logic Programming, Forward Verses Backward Reasoning, Matching, Control Knowledge.

UNIT IV

Probabilistic Reasoning: Representing Knowledge in an Uncertain Domain, Bayesian Networks, Dempster-Shafer Theory. Planning: Overview, Components of A Planning System, Goal Stack Planning, Hierarchical Planning. Learning: Forms Of Learning, Inductive Learning, Explanation Based Learning, Neural Net Learning & Genetic Learning.

UNIT V

Natural Language Processing: Brief introduction to Syntactic Processing, Semantic Analysis, Discourse & Pragmatic Processing. Robotics: Introduction, Robot hardware, robotic perception, planning to move, planning uncertain movements, robotic software architecture, application domains.

Text Books:

1. Russel S. and Norvig P., Artificial Intelligence a Modern Approach, 3rd edition, PearsonEducation.
2. Rich E. & Knight K., Artificial Intelligence, 3rd edition, TMH, New Delhi.

Reference books:

1. Patterson Dan W., Introduction to Artificial Intelligence and Expert Systems, PHI, NewDelhi, 2006.
2. Rolston D.W., Principles of AI & Expert System Development, TMH, New Delhi.

Learning Outcomes

Identify problems where artificial intelligence techniques are applicable. Apply selected basic AI techniques; judge applicability of more advanced techniques. Participate in the design of systems that act intelligently and learn fromexperience.

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective V	PECCSE703

NET Programming

Objectives:

Provide a consistent, object-oriented programming environment whether object code is stored and executed locally, executed locallybut web-distributed, or executed remotely.

UNIT I

C# basics C# and the .NET framework – C# basics – Objects and types – Inheritance –Arrays – Operators and casts – Indexers.

UNIT II

Advanced C# features Delegates and events – Strings and regular expressions – Generics – Collections–Memory management and pointers – Errors and exceptions.

UNIT III

I/O and network programming Tracing and events - threading and synchronization - .Net security – localization –Manipulating XML - Managing the file system – basic network programming

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UNIT IV

Window and web applications Window based applications – Data access with .NET –basics of ASP .NET -**Introduction to web services.**

UNIT V

NET Features Architecture – Assemblies – shared assemblies – CLR hosting –Appdomains – Reflection.

Text Books:

1. Nagel,C. , Evjen,B. , Glynn,J. , Watson,K. , and Skinner,M.,"Professional C# 4 with .NET 4," Wiley India, 2010.
2. Liberty ,J., and MacDonald ,B., "Learning C# 3.0," First Edition ,O'Reilly, 2008.

References Book:

1. Troelson, A., "Pro C# 5.0 and the.NET 4.5 Framework," Sixth Edition, Apress,2012.

COURSE OUTCOMES:

Upon the completion of the course students will be able to Learners will be able to design web applications using ASP.NET Learners will be able touse ASP.NET controls in web applications Learners will be able to create database driven ASP.NET web applications and web services

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Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Professional Elective V	PECCSE703

Internet of Things

Objectives:

The goal behind the Internet of things is to have devices that self report in real-time, improving efficiency and bringing important information to the surface more quickly than a system depending on human intervention.

UNIT I

Introduction to IOT The definition of the Internet of Things, main assumptions and perspectives. Platform for IoT devices Device architectures. Conventional and renewable power sources for resource constrained devices. Operating systems for resource-constrained devices.

UNIT II

Architecture of IOT Node structure: Sensing, Processing, Communication, Powering IOT networking: Topologies, Layer/Stack architecture, The data link layer for IoT- Wireless communication technologies. Wire communication technologies. Manet Networks.

UNIT III

Communication Technologies Introduction to ZigBee, BLE, WiFi, LTE, IEEE 802.11ah, Discuss data rate, range, power, computations/bandwidth, QoS, Service oriented protocols (COAP). Communication protocols based on the exchange of messages (MQTT). Service discovery protocols.

UNIT IV

M2M and IoT Technology Fundamentals Devices and gateways, Local and wide area networking,

Data management, Business processes in IoT, Everything as a Service (XaaS), M2M and IoT Analytics, Knowledge Management.

UNIT V

The data processing for IoT Organization of data processing for the Internet of things. Cloud computing. Fog computing. Application case studies: Smart Grid. Home Automation. Smart City.

Text books:

1. Madisetti Vijay and Bahga Arshdeep, Internet of Things (A Hands-on Approach), 1st Edition, VPT, 2014.
2. Raj Pethuru and Raman Anupama C., The Internet of Things: Enabling Technologies, Platforms, and Use Cases, CRC Press.

Reference books:

1. Vermesan Dr. Ovidiu, Friess Dr. Peter, Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems, River Publishers.
2. Holler Jan, Tsiatsis Vlasios, Mulligan Catherine, Aves and Stefan, Karnouskos Stamatis, Boyle David, From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, 1 st Edition, Academic Press, 2014.

Learning Outcomes:

Along with an exponential growth in connected devices, each thing in IoT communicates packets of data that require reliable connectivity, storage, and security. With IoT, an organization is challenged with managing, monitoring, and securing immense volumesof data and connections from dispersed devices.

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Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Open Elective III	OECCSE704

Auto CAD

Objectives:

AutoCAD is a computer-aided design software developed by the company Autodesk (hence the name AutoCAD). It allows you to draw and edit digital 2D and 3D designs more quickly and easily than you could by hand. The files can also be easily saved and stored in the cloud, so they be accessed anywhere at anytime

Module I

Theory Introduction

Principle of drafting, Terminology, & fundamentals. Size & shape descriptions. Geometric Construction. Plan views, Auxiliary views, Section Views. Projection , Method of Projection. Multi-view Orthographic Projection. Projection Techniques.

Module III CADD

Introduction of CADD (Computer Aided Drafting & Designing). Function keys, Shortcut keys, Different sizes of paper. Application of CADD – Automatic Drafting, Geometric Modeling Geometric Modeling – Wire frame Modeling, Surface Modeling, and Solid Modeling. CADD Application & it's feature Introduction to Standard based 2D drafting (Based on International standard for representation & conformation)

Practical Competencies

- Practice on Drawing basics
- Geometrical Drawing Practice
- Making plan of Projection.

- Creation Multi-view Orthographic projection.
- Drafting views in First angle & Third angle Projection.
- Creating Auxiliary views & Sections.
- Freehand Sketching.
- Representing Standard base 2D drafting.
- Drawing Elementary CADD command – Line, Polyline, Polygon, Circle, Polyline, arc, ellipse, Text Single Text, Multi text, D text.
- Modifying Elementary Commands – Erase, Move, Copy , Mirror, Offset, Scale, Stretch, Chamfer, fillet & explode.
- Making layers, line type & Line weight.
- Different menus of Auto-Cad, Function keys, Shortcut keys, Paper size.
- Making Title Block, Writing it & inserting it in any drawing file with scale, angle & explode Options.
- Creating a new template file (.Dwt file) & applying it to every drawing file.
- Drafting of building plan , Elevation , Section Views.

Outcomes:

Intended Outcomes for the course

Upon completion of the course students will be able to:

- Utilize the power and precision of AutoCAD as a drafting and design tool used in the mechanical design and manufacturing industries.
- Apply basic CAD concepts to develop and construct accurate 2D geometry through creation of basic geometric constructions.
- Create, manipulate and edit 2D drawings and figures.
- Apply elements of mechanical drafting such as layers, dimensions, drawing formats, and 2D figures in projects with a focus on ANSI industry standards.

RKDF UNIVERSITY RANCHI

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Industrial Psychology	HSMC 701

Some of the objectives of industrial psychology are as follows:

Industrial psychology tries to find out how a proper individual can be selected to perform particular task, if this can be done, then the work gets the right worker while himself gets the work he can do best.

Module-I Introduction: The role of the psychologist in industry, the field of occupational Psychology: Study of behavior in work situation and applications of Psychological principles to problems of selection, Placement, Counseling and training

Module-II Design of Work Environments: Human engineering and physical environment techniques of job analysis, Social environment: Group dynamics in Industry Personal psychology, Selection, training, placement, promotion, counseling job motivations, job satisfaction. Special study of problem of fatigue, boredom and accidents

Module-III Understanding Consumer Behavior: Consumer behaviour, study of consumer preference, effects of advertising, Industrial morale: The nature and scope of engineering psychology, its application to industry

Module-IV Work Methods: Efficiency at work, the concept of efficiency, the work curve, its characteristics, the work methods; hours of work, nature of work, fatigue and boredom, rest pauses. The personal factors; age abilities, interest, job satisfaction, the working environment, noise, illumination, atmospheric conditions, increasing efficiency at work; improving the work methods, Time and motion study, its contribution and failure resistance to time and motion studies, need for allowances in time and motion study.

Module-V Work and Equipment Design: Criteria in evaluation of job- related factor, job design,

human factors, Engineering information, input processes, mediation processes, action processes, methods design, work space and its arrangement, human factors in job design. Accident and Safety:

The human and economic costs of accidents, accident record and statistics, the causes of accidents situational and individual factors related to accident reduction.

Suggested readings:

a. Tiffin, J and Mc Cormic E.J., Industrial Psychology, Prentice Hall, 6th Edn., 1975.

b. Mc Cormic E.J., Human Factors Engineering and Design, McGraw Hill, 4thEdn.,1976.

a. Mair, N.R.F., Principles of Human relations

b. Gilmer, Industrial Psychology

c. Ghiselli & Brown, Personnel and Industrial Psychology.

d. Myer, Industrial Psychology.

e. Dunnete, M.D., Handbook of Industrial and Organizational Psychology.

f. Blum & Taylor, Industrial Psychology

Learning Outcomes In this program, STUDENTS will:

1. Engage in ethical and lawful decision making and problem-solving about people at work;
2. Understand the theoretical frameworks of psychology that can be applied to make an organization more effective and efficient;
3. Acquire the necessary interpersonal, behavioral and technical skills for application in the work setting;
4. Demonstrate writing, reading, critical thinking, speaking and collaboration skills;
5. Perform effectively in a capstone experience that involves the application of our research in I/O Psychology.

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Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Project-I	PROJCSE701

Note- A student can be allowed to do the project outside after the permission of Departmental Academic Committee.

- Those who are doing project outside but within the same city has to present their project progress every month.
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New Scheme Based on AICTE Flexible Curricula

Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	**Professional Elective Course-IV Lab**	PECCSE755

Machine Learning Lab

1. Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.
2. For a given set of training data examples stored in a .CSV file, implement and demonstrate the Candidate-Elimination algorithm to output a description of the set of all hypotheses consistent with the training examples.
3. Write a program to demonstrate the working of the decision tree based ID3 algorithm. Use an appropriate data set for building the decision tree and apply this knowledge to classify a new sample.
4. Build an Artificial Neural Network by implementing the Back propagation algorithm andtest the same using appropriate data sets.
5. Write a program to implement the naïve Bayesian classifier for a sample training data set stored as a .CSV file. Compute the accuracy of the classifier, considering few test datasets.
6. Assuming a set of documents that need to be classified, use the naïve Bayesian Classifier model to perform this task. Built-in Java classes/API can be used to write the program. Calculate the accuracy, precision, and recall for your data set.
7. Write a program to construct aBayesian network considering medical data. Use this model to demonstrate the diagnosis of heart patients using standard Heart Disease Data Set. You can use Java/Python ML library classes/API.

8. Apply EM algorithm to cluster a set of data stored in a .CSV file. Use the same data set for clustering using k-Means algorithm. Compare the results of these two algorithms and comment on the quality of clustering. You can add Java/Python ML library classes/API in the program.
9. Write a program to implement k-Nearest Neighbor algorithm to classify the iris data set. Print both correct and wrong predictions. Java/Python ML library classes can be used for this problem.
10. Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs.

Text Books:

1. Floreano, D. and Mattiussi, C., "Bio-Inspired ArtificialIntelligence", MIT Press,2008.
2. Neumann, F. and Witt, C., “Bio inspired Computation in combinatorial optimization: Algorithms and their computational complexity”, Springer, 2010.
3. Elben, A. E. and Smith, J. E., “Introduction to EvolutionaryComputing”, Springer, 2010. Goldberg, D. E., “Genetic algorithms in search, optimization, and machine learning”, Addison- Wesley, 1989.
4. Haykin, Simon O., “Neural Networks and LearningMachines”, Third Edition, Prentice Hall, 2008.

Reference Books:

1. Dorigo, M. and Stutzle, T., “Ant Colony Optimization”, A BradfordBook, 2004.
2. Ebelhart, R. C. et al., “Swarm Intelligence”, Morgan Kaufmann,2001

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Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science &Engineering)	**Professional Elective Course-IV Lab**	PCCCSE755

Artificial Intelligence Lab

1. To solve Tic-Tac-Toe problem such that computer always win. (Min-Max Search)
2. To solve Monkey-Banana Problem
3. To solve Missionaries and Cannabal Problem.
4. To solve Water-Jug problem.
5. To implement Depth First Search (DFS)
6. To implement Breadth First Search (BFS)
7. To solve Hill Climbing
8. To solve Best First Search 19. Lab Assignment
9. To solve A*. 20. Lab Assignment
10. To solve AO*.
11. To implement real world Games. Chess Playing (Computer vs Human)
12. To implement real-world Games. Sudoku Puzzle

TEXT BOOKS

1. Prolog Programming by Bratko, PHI publishing.
2. Dan W. Patterson - Introduction to Artificial Intelligence andExpert Systems, PHI, New Delhi, 2006

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Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech (Computer Science &Engineering)	**Professional ElectiveCourse-V Lab**	PCCCSE751

.NET Programming Lab

List of experiments:

1. Simple application using web controls

a) Finding factorial Value

b) Money Conversion

c) Quadratic Equation

d) Temperature Conversion

e) Login control

2. States of ASP.NET Pages

3. Adrotator Control

4. Calendar control

a) Display messages in a calendar control

b) Display vacation in a calendar control

c) Selected day in a calendar control using style

d) Difference between two calendar dates

5. Tree view control

a) Treeview control and datalist

b) Treeview operations

6. Validation controls

7. Query textbox and Displaying records

8. Display records by using database

Text Books:

1. Nagel,C. , Evjen,B. , Glynn,J. , Watson,K. , and Skinner,M.,"Professional C# 4with .NET 4," Wiley India, 2010.
2. Liberty ,J., and MacDonald ,B., "Learning C# 3.0," First Edition ,O'Reilly,2008.

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Semester – VII

Course Content

Branch	Subject Title	Subject Code
B.Tech. (Computer Science & Engineering)	Seminar	SEM756

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BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING (B.TECH. CSE)

New Scheme Based on AICTE Flexible Curricula

Choice Based Credit System Semester

Semester – VIII

B. TECH IN COMPUTER SCIENCE AND ENGINEERING

(COURSE SCHEME & MARKS DISTRIBUTION)

SL. No.	Category	Subject Code	Subject Name	Periods			Credits	Marks Distribution				
								Internal	External		Total	
				L	T	P		Max	Max	Min	Max	Min
	Project	PROJINT801	Project-II				**8**	**30**	**70**	**21**	**100**	**35**

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