

Vision and Mission of the INSTITUTE

Vision:

To emerge as a comprehensive Institute that provides quality technical education and research thereby building up a precious human resource for the industry and society.

Mission:

- To provide a learner-centered environment that challenges individuals to actively participate in the education process.
- To empower the faculty to excel in teaching while engaging in research, creativity and public service.
- To develop effective learning skills enabling students to pick up critical thinking thus crafting them professionally fit and ethically strong.
- To reach out industries, schools and public agencies to partner and share human and academic resources.

Vision and Mission of the Department

Vision:

The department is committed to continually improve its educational environment in order to develop graduates with the strong academic and technical backgrounds needed to get distinction in the discipline globally and to achieve academic excellence by imparting in-depth knowledge to the students, facilitating research activities and cater to the ever changing industrial demands and societal needs.

Mission:

- M1:** To encourage students to become self-motivated, problem solving individuals who can find and understand of the knowledge needed to be successful in their profession.
- M2:** To provide intellectual inputs to knowledge-based industries in the form of qualified and trained manpower.
- M3:** To attain self-sustainability and overall development through Research and Consultancy.
- M4:** To produce best quality Computer Science Professionals by imparting quality training, hands on experience and value education.
- M5:** Providing an environment in which students are given the essential resources to address and solve real-world problems, participating in interdisciplinary and multidisciplinary research and its applications.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1:To produce graduates having strong fundamental knowledge in basic sciences and engineering, along with sound principles of computer programming with exposure to Computer Science and Engineering concepts that lead to problem solving techniques.

PEO2:To produce employable graduates who will be placed in various engineering positions in the computational world in firms of international repute.

PEO3:To produce graduates with strong communication skills and work effectively on team-based software development projects and will practice the ethics of their profession consistent with a sense of social responsibility.

PEO4:To pursuit of advanced degrees in engineering at different levels of research and consultancy. They get exposed to several other domains resulting in lifelong learning to broaden their professional knowledge.

PROGRAMME OUTCOMES (POs)

An Engineering Graduate will be able to:

- PO1:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO6:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

NBKR INSTITUTE OF SCIENCE & TECHNOLOGY: VIDYANAGAR (AUTONOMOUS)
(AFFILIATED TO JNTU ANANTAPUR: NELLORE)
SPSRNELLORE DIST

IB.TECH (yearly pattern) Scheme of Instruction and Evaluation
(Common to all branches)
(With effect from the Academic Year 2013-2014)

Course Code	Course Title	Instruction			Credits	Evaluation						Maximum Total Marks				
		Hours/Week				Sessional Test-I		Sessional Test-II		Sessional Test-III			Total Sessional Marks (Max. 40)	End Semester Examination		
		L	T	D/P		Duration In Hours	Max. Marks	Duration In Hours	Max. Marks	Duration In Hours	Max. Marks	0.4*first Best + 0.4*second best + 0.2*Least		Duration In Hours	Max. Marks	100
13SH1001	English	2	-	-	4	2	40	2	40	2	40			3	60	100
13SH1002	Engineering Mathematics-I	3	1	-	8	2	40	2	40	2	40			3	60	100
13SH1003	Engineering Mathematics-II	3	1	-	8	2	40	2	40	2	40			3	60	100
13SH1004	Engineering Physics	2	-	-	4	2	40	2	40	2	40			3	60	100
13SH1005	Engineering Chemistry	2	-	-	4	2	40	2	40	2	40			3	60	100
13CS1001	Computer Programming & Data Structures	3	1	-	8	2	40	2	40	2	40			3	60	100
13EE1001	Basic Electrical Sciences	3	1	-	6	2	40	2	40	2	40			3	60	100
13SH10P1	English Language Laboratory			3	4	-	-	-	-	-	-		Day to Day Evaluation and a test (40 Marks)	3	60	100
13ME10P1	Workshop			3	4	-	-	-	-	-	-			3	60	100
13CS10P1	Programming Laboratory			3	4	-	-	-	-	-	-	3		60	100	
	TOTAL	18	4	9	54								600	1000		

13SH1001- ENGLISH

Course Category	Humanities and Social Sciences	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	2-0-0
Prerequisite:	Comprehending the basic level of comprehensions, Intermediate level of error analysis , Ability to use appropriate language in informal	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Correct the error of the sentence; improve language proficiency and face competitive exams like GATE, GRE, TOEFL, GMAT etc.
	CO2	Comprehend the advanced level of reading comprehensions
	CO3	Write clear and coherent passages for social and Professional contexts
	CO4	Compose proposals, business letters
	CO5	Acquire considerable flair in using broad range of vocabulary
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT-I</u></p> <p>Chapter I ‘Humor’ from ‘Using English’ Biography –(HomiJehangirBhabha) from “New Horizons” R- Reading Strategies- Skimming and Scanning. G- Parts of Speech- Noun-number, pronoun-personal pronoun, -Subject &Pronoun agreement. Ver b</p> <p style="text-align: center;"><u>UNIT-II</u></p> <p>Chapter II ‘Inspiration’ from “Using English” ‘Biography-(My Struggle for an Education)’ form “New Horizons” R- Note making strategies W- Paragraph- types- topic sentences, unity, coherence, length, linking devices G- Articles-Prepositions-Tenses- Present tense, Past tense and Future tense</p> <p style="text-align: center;"><u>UNIT-III</u></p> <p>Chapter III ‘Sustainable Development’ from ‘Using English’ Short Story- (The Happy Prince) from “New Horizons” G .Non-finite verbs, Auxiliary verbs and question tags V- Word formation and One-Word Substitutes</p> <p style="text-align: center;"><u>UNIT-IV</u></p> <p>W- Writing Strategies- Sentence structures-Letter Writing-Dialogue Writing- Public Speaking G- Transformation of Sentences (Direct and Indirect/ Active and Passive) V- Affixes-prefix and suffix, root words, derivatives</p> <p style="text-align: center;"><u>UNIT-V</u></p> <p>W- Technical Report writing-strategies, formats-types-technical report</p>	

	<p>G-Conditional clauses, Transformation of Sentences (Degrees of Comparison/Connectives)</p> <p>V- Collocations and Technical Vocabulary and using words appropriately- Synonyms- antonyms, homonyms, homophones, homographs, words often confused.</p>
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Using English 2. New Horizons <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Oxford/Cambridge Advanced Learners Dictionary 2. Rojet's Thesaurus
E-Resources	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevidelectures.com/university/iitm

13 SH 1002 - ENGINEERING MATHEMATICS-I

Course Category	Mathematics and Basic Sciences	Credits:	8
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Trigonometric , Differentiation, integration Formulas and Equation Simplifications	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understand the concepts of rank of the matrices, linear and non-linear system of equations, Eigen-values and Eigen-vectors, apply Caley-Hamilton theorem, diagonalizable of symmetric matrices and demonstrate the nature of quadratic forms.
	CO2	Understanding effectively the mean value theorems and Maxima and Minima of a function of two variables – Lagrange’s method of multipliers
	CO3	Understanding effectively the geometrical aspects of curvature, involutes and evolutes of plane curves, essential concepts for an engineer, as elegant applications of differential calculus.
	CO4	Demonstrate the knowledge and understanding of double integration and triple integration using Cartesian, polar co-ordinates and also understand effectively areas and volumes.
	CO5	Apply Green’s theorem, Gauss’ theorem and Stokes’ theorem.
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT I</u></p> <p>MATRICES - Rank of Matrix:-Echelon Form and Normal Form - Consistency of system of linear equations- Eigen values and Eigen vectors- Cayley – Hamilton’s theorem-Diagonalization of matrix- Quadratic forms.</p> <p style="text-align: center;"><u>UNIT II</u></p> <p>DIFFERENTIAL CALCULUS - Rolle’s, Lagrange’s and Cauchy’s mean value theorems (without proofs) - Taylor’s and Maclaurin’s series (only one variable) - Maxima and Minima of a function of two variables – Lagrange’s method of multipliers.</p> <p style="text-align: center;"><u>UNIT III</u></p> <p>Radius of curvature, involutes and evolutes Beta and Gamma functions. Curve tracing (only Cartesian form)</p> <p style="text-align: center;"><u>UNIT IV</u></p> <p>INTEGRAL CALCULUS - Double and Triple Integrals- Change of order of integration- Change of variables- Simple applications to areas and volumes.</p> <p style="text-align: center;"><u>UNIT V</u></p> <p>VECTOR CALCULUS - Gradient, Divergence, Curl - Laplacian and Second Order Operators- Line, Surface and Volume integrals- Potential function- Green’s theorem, Stoke’s theorem and Gauss Divergence theorem (without proof)- Verification of Green’s , Stoke’s and Gauss Divergence theorem.</p>	

Text Books and Reference Books:	TEXT BOOKS: <ol style="list-style-type: none"> 1. Higher Engineering Mathematics – B S Grewal 2. Engineering Mathematics- B V Ramana 3. Elementary Engineering Mathematics – B S Grewal REFERENCES: <ol style="list-style-type: none"> 1. Advanced Engineering Mathematics- H K Das 2. Advanced Engineering Mathematics- N P Bali & M Goyal
E-Resources	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm

13SH1003 - ENGINEERING MATHEMATICS-II

Course Category	Mathematics and Basic Sciences	Credits:	8
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Trigonometric , differentiation, integration Formulas, Roots finding and partial fractions And Equation Simplifications	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Students will be able to understand the basic theories and methods of differential equations, and to apply the fundamental techniques of differential equations to perform analysis and computation of solutions to various differential equations.
	CO2	Understanding effectively the Laplace Transformations of standard functions and their properties.
	CO3	Understanding effectively the unit step function, Dirac's delta function, convolution theorem and also the applications of Laplace transforms to differential equations.
	CO4	Understanding effectively Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems
	CO5	The definition of the Fourier transform and how to compute it for standard examples and also understand effectively the Fourier integral in complex form, finite and infinite Fourier transforms, Fourier sine and cosine transforms.
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Ordinary Differential Equations: Linear Differential Equations of second and higher order with constant coefficients- Method of variation of parameters- Equations reducible to linear equations with constant Coefficients- Cauchy's linear equations – Legendre's linear equation.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Laplace Transformation: Laplace Transformations of standard functions- Properties of Laplace Transformation- Transformation of derivatives and integrals- Initial and Final value theorems-Transforms of unit step function and impulse function – Transform of periodic functions.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Inverse Laplace Transformation: Inverse transforms- Unit step function- Dirac's delta function-Convolution theorem- Transforms of periodic functions- Application to solutions of Ordinary Differential Equations.</p> <p style="text-align: center;"><u>UNIT-IV</u></p> <p>Fourier series: Determination of Fourier coefficients- Fourier series- Even and Odd</p>	

	<p>functions-Change of intervals- Half Range Sine and Cosine Series- Complex form of Fourier series- Parseval's formula.</p> <p style="text-align: center;"><u>UNIT-V</u></p> <p>Fourier Transforms: Fourier Integral Theorem- Fourier Sine and Cosine integral- Fourier integral in complex form – Finite and Infinite Fourier Transforms- Fourier Sine and Cosine transforms properties- Inverse transforms.</p>
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Higher Engineering Mathematics –B S Grewal 2. Engineering Mathematics- B V Ramana 3. Engineering Mathematics- M K Venkata Raman <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Advanced Engineering Mathematics- H K Das 2. Advanced Engineering Mathematics- N P Bali and M Goyal.
E-Resources	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm

13SH1004 - ENGINEERING PHYSICS

Course Category	Mathematics and Basic Sciences	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	2-0-0
Prerequisite:	Basics in Intermediate Physics	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding the wave particle behaviour of matter Schrodinger wave equation and electronic behaviour in metals
	CO2	Understand the structure of crystalline solids and their applications in X-ray diffraction
	CO3	Know the properties of semiconductor materials by projecting the view of energy bands and know the concept of magnetization and applications of magnets in various disciplines.
	CO4	Understand the utilization of laser technology in various disciplines. Basic Understands of Acoustics.
	CO5	Understand the concept of optical fiber and its applications. Basic ideas about super conductor and their uses in different fields.
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>QUANTUM MECHANICS AND FREE ELECTRON THEORY : Quantum Mechanics: Wave – Particle duality - de’Broglie hypothesis of Matter waves –Properties of matter waves Heisenberg’s uncertainty principle and its applications–Schrodinger’s time independent wave equation –Significance of wave function–Particle in a one dimensional infinite potential well. Free Electron Theory: Classical free electron theory- Sources of electrical resistance –Equation for electrical conductivity – Quantum free electron theory- Fermi level and Fermi –Dirac distribution– Bloch theorem -Kronig – Penny model (qualitative) Origin of bands in solids –Classification of solids into conductors, semiconductors and insulators.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>SEMI CONDUCTORS AND MAGNETIC MATERIALS : Semiconductor Physics: Introduction – Intrinsic and extrinsic semiconductors carrier concentration in intrinsic semiconductors - Drift and diffusion currents Einstein’s equation –Hall effect-direct and indirect band gap semiconductors. Magnetic Materials : Introduction and basic definitions –Origin of magnetic moments –Bohr magneton –Classification of magnetic materials into dia, para, ferro, antiferro and ferri magnetic materials –Hysteresis –Soft and hard magnetic materials and applications</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>CRYSTALLOGRAPHY AND X-RAY DIFFRACTION AND DEFECTS IN CRYSTALS: Crystallography : Introduction–Space lattice–Unit cell–Lattice parameters–Bravias lattices crystal systems–Packing fractions of SC,BCC and FCC structures-Directions and planes in crystals–Miller indices –interplanar spacing in cubic crystals</p>	

	<p>X-ray diffraction in crystals: X-ray diffraction–Bragg’s law–Laue photograph method–Powder crystal method (Debye –scherrer method).</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>LASERS AND ULTRASONICS: Lasers: Introduction – Characteristics of laser –Spontaneous and simulated emission of radiation–Population inversion–Excitation mechanisms and optical resonator–Ruby laser–He Ne laser–Semi conductor laser–Applications of lasers. Ultrasonic’s: Introduction Production of ultrasonic’s by piezoelectric method and magneto striction method – Detection and Applications of Ultrasonic’s.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>FIBER OPTICS AND SUPERCONDUCTIVITY: Fiber Optics : Introduction–Construction and working principle of optical fiber– Numerical aperture and acceptance angle–Types of optical fibers–Attenuation and losses in fibers–Optical fiber communication system–Applications of optical fibers in communications, sensors and medicine Superconductivity: Introduction–Meissner effect–properties of superconductors– Type I and II superconductors–Flux quantization–London penetration depth–ac and dc Josephson effects–BCS theory (qualitative)–Applications of superconductors</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Engineering Physics : P. K. Palaniswamy SciTech Publications 2. Engineering Physics : V.Rajendran and K.Tyagarajan Tata McGraw Hill Publications – III Edition 3. Engineering Physics : R.K. Gaur and G.L.Guptha Danapati Rai Publications <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Solid State Physics : A.J.Dekkar Mcmillan Publications –Latest Edition 2012 2. Engineering Physics : M.Arumugam Anuradha Publications II Edition 3. Applied Physics : Rama Chandra B &SubramanyamSV Hitech Publications 4. Solid State Physics : S.O.Pillai New age International Publications 5. Solid State Physics : Puri RK and Babbar VK Chand & Co Publications 6. Engineering Physics : M.N.Aaravindhnanulu and P.G.Krishisagar Chand & CO Publications Revised Edition 2013
<p>E-Resources</p>	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm

13SH1005 - ENGINEERING CHEMISTRY

Course Category	Mathematics and Basic Sciences	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	2-0-0
Prerequisite:	Basics in Intermediate Chemistry	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understand the electrochemical sources of energy
	CO2	Understand industrially based engineering materials
	CO3	Differentiate between soft and hard water
	CO4	Understand the disadvantages of using hard water and apply suitable treatments
	CO5	Understand the basics of polymers and their uses in engineering field.
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>ELECTRO CHEMISTRY - Single electrode potential – explanation and measurement-Reference electrodes: Hydrogen gas electrode-calomel electrode-glass electrode Electrochemical cells-Numerical calculations-Batteries: Rechargeable cells and batteries (Lead-Acid storage cells, Al-Air Batteries)-Fuel Cells : Hydrogen - Oxygen fuel cell Corrosion: Definition-classification-Factors affecting the corrosion-Prevention methods of corrosion – metallic coatings (Electroplating) and cathodic protection.</p> <p style="text-align: center;"><u>UNIT-II</u></p> <p>CHEMISTRY OF ENGINEERING MATERIALS- Electrical insulators: Definition-classification-Characteristics-Application of electrical insulating materials (solid, liquid and gaseous insulators) Refractories: Classification-properties and applications Lubricants: Lubricant -Lubrication-Theory of lubrication-Properties and applications of lubricants.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>FUEL TECHNOLOGY- Classifications of Fuels -Characteristics of fuels - Calorific value – determination – Bomb calorimeter - Boys gas calorimeter - Theoretical calculation of calorific value. Solid fuels-coal-analysis of coal - metallurgical coke Liquid fuels: Petroleum – refining of petroleum - Synthetic petrol – Fischer Tropch’s synthesis Gaseous fuel – Flue gas analysis by Orsat’s apparatus</p>	

	<p style="text-align: center;"><u>UNIT – IV</u></p> <p>WATER TREATMENT - Impurities in water-Hardness of water-disadvantages of water-Estimation of hardness by EDTA method-Estimation of dissolved oxygen-alkalinity-chlorides in water</p> <p>Industrial use of water: For steam generation-troubles of boilers-scale and sludge- priming and foaming-caustic embrittlement-boiler corrosion</p> <p>Softening methods of hard water: Lime-soda process- Zeolite process-Ion exchange method</p> <p style="text-align: center;"><u>UNIT-V</u></p> <p>POLYMERS- Introduction to polymers-Polymerization process-types of polymerization</p> <p>Elastomers: natural rubber – vulcanization of rubber – compounding of rubber- Synthetic rubbers: preparation, properties and engineering applications of Buna – N, Neoprene, Thiokol and silicon rubbers</p> <p>Plastomers: Thermosetting and thermoplastics-Moulding constituents of plastics- Preparation, properties and engineering applications of PVC, Bakelite, Nylons and Urea-Formaldehyde.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Engineering Chemistry : PC Jain & M jain 2. Engineering Chemistry: IBK Sharma. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Engineering Chemistry: SS Dhara 2. Physical Chemistry: Puri and Sharma 3. Physical Chemistry: B AHL & TULI
<p>E-Resources</p>	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevidelectures.com/university/iitm

13EE1001 - BASIC ELECTRICAL SCIENCES

Course Category	Mathematics and Basic Sciences	Credits:	6
Course Type:	Theory	Lecture – Tutorial – Practical:	3-0-0
Prerequisite:	Basic Electrical terminology	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Solve the electrical networks mathematically
	CO2	Achieve elementary knowledge of electromagnetism
	CO3	Distinguish between DC and AC circuits and analyze them
	CO4	Achieve elementary knowledge of Electric machines
	CO5	Apply different energy conservation measures and create social awareness on home energy management
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Concept of Electric Circuits: Active and passive elements, Ideal & Practical Sources, Source Transformation, V-I Characteristics of R, L and C elements, Kirchoff's laws, Network reduction techniques, Star-Delta transformation, Mesh & Nodal analysis, Concept of Super mesh and Super node.</p> <p>Graph theory: Network topology, Cut set and Tie set matrices. Duality & Dual circuits-Concept of mutual inductance, Concept of coupling and dot convention.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Fundamentals of AC circuits: Periodic wave forms – average and effective values of different wave forms, Form factor and crest factor, Phase and phase difference – phase notation, Concept of reactance, impedance, susceptance and admittance, Active & re-active power, Power factor-power triangle, Response of R, L and C elements for sinusoidal excitation.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Steady state analysis: RL, RC and RLC circuits for sinusoidal excitation, Phasor diagrams.</p> <p>Resonance: Series and parallel Resonance, Half power frequencies, Bandwidth and Q factor, Relation between half power frequencies- Bandwidth – Quality factor.</p> <p style="text-align: center;"><u>UNIT-IV</u></p> <p>Junction diode: Band structure of PN-junction – current components- Volt ampere characteristics and its temperature dependence – diode resistance and capacitance- Zener diode and tunnel diode.</p> <p>Opto Electronic Devices: Photo emission, principle of operation of photo conductors, photo diodes, transistors, LED and LCD.</p>	

	<p style="text-align: center;"><u>UNIT-V</u></p> <p>Bipolar Junction Transistor: Transistor action- PNP and NPN transistors. CB, CE, CC configurations and their characteristics analytical expressions for transistor characteristics- Specifications of BJT- Determination of h- Parameters from BJT characteristics.</p> <p>Field Effect Transistor: Construction and operation -- Characteristics and applications of JFET</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Circuits & Networks: A. Sudhakar and Shyam Mohan – TM 2. Circuit Theory: A. Chakarabarti - Dhanpat Rai 3. Electronic devices and circuits by Boylston, Louis Nashelsky, 9ed., 2008 PE 4. Engineering Circuit Analysis: William Hayt & Kemmerly, TMH 5. FLOYD - "Electronic devices", Pearson education. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Network Analysis: Vanvalkenberg 3ed, PHI 2. Mottershed, "Electronic devices and circuits", Prentice Hall of India. 3. Millman and Halkias, "Integrated Electronics" MC Graw Hill & Co., 4. David.A.Bell. "Electronic Devices and circuits", PHI. 5. Adel S.Sedra, Kenneth C. Smith, "Micro Electronic Circuits", Holt Sander's Japan
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13 CS 1001 - C PROGRAMMING AND DATA STRUCTURES

Course Category	Basic Engineering Courses	Credits:	8
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Fundamentals of algorithms, flow charts and flow control, Basic understanding of C programming language, Text Editors, compilers and execution of programs etc	Sessional Evaluation: 40 Univ.Exam Evaluation: 60 Total Marks: 100	

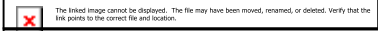
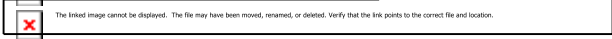
Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Describe fundamentals of programming basics
	CO2	Analyze and solve problems using a procedural and algorithmic approach with functional decomposition.
	CO3	Apply knowledge of computing and mathematics using simple data structures
	CO4	Develop skill to use pointers, memory allocation and data handling through files in 'C'
	CO5	Understand the process of compiling, linking, and running a program using a computing tool
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Algorithms, flow charts, Program Development Steps, Introduction To C Language: Basic Structure of C Program, Identifiers, Basic data types, Variables, Operators. Operator Precedence and Associativity, Expression Evaluation, Type conversions.</p> <p>Selection Statements: Various forms of if statements, switch statement, Iteration: while, do-while, for statements, other control altering statements– break, continue, goto and exit.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Arrays: Declaration, initialization, accessing elements, storing elements, two-dimensional and multi-dimensional arrays, applications of arrays.</p> <p>Strings– Declaration, initialization, Built-in and user-defined String handling Functions Functions: Basics, call by value and reference, recursive functions, Scope rules.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Storage Classes: auto, register, static, extern. Type qualifiers, Pre-processor Directives. Pointers: Initialization of pointers, Address Arithmetic, Dynamic memory allocation functions, array of pointers, pointers to functions, command–line arguments. Structures: Declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, pointers to structures, self-</p>	

	<p style="text-align: center;"><u>UNIT – IV</u></p> <p>Data Structures: Overview of Data Structures, Linked lists – implementation of Operations in singly linked list, Stacks & Queues: Basic Operations, representations of stacks and queues using arrays and linked lists, Applications.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Graphs And Trees: Representation and Traversals. Searching And Sorting: Sorting - selection sort, bubble sort, insertion sort, quick sort, merge sort. Searching – linear and binary search methods.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning. 2. Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, Fifth Edition, Pearson Ed.
<p>E-Resources</p>	<div style="display: flex; align-items: center;">  <div style="border: 1px solid black; padding: 2px; font-size: 8px; margin-right: 5px;">The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</div> <div style="border: 1px solid black; width: 150px; height: 15px; margin-left: 5px;"></div> </div> <div style="display: flex; align-items: center; margin-top: 5px;">  <div style="border: 1px solid black; padding: 2px; font-size: 8px; margin-right: 5px;">The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</div> <div style="border: 1px solid black; width: 150px; height: 15px; margin-left: 5px;"></div> </div>

13 CS 10P1 - PROGRAMMING LABORATORY

Course Category	Basic Engineering Course	Credits:	4
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Fundamentals of algorithms, flow charts and flow control, Basic understanding of C programming language, Text Editors, compilers and execution of programs etc..	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Implementation of C and Data structure programs and observe the functionality of output
Course Content	<ol style="list-style-type: none"> 1) Write a C program to implement the following <ol style="list-style-type: none"> i) Convert Centigrade to Fahrenheit and vice versa ($f=(9/5)*c+32$) ii) Sum of the n natural numbers ($(n(n+1))/2$) iii) Sum of the squares of the n natural numbers ($(n(n+1)(2n+1))/6$) iv) Slope and midpoint of line using its end points (slope = $(y_2-y_1)/(x_2-x_1)$, midpoint $\rightarrow x=(x_1+x_2)/2, y=(y_1+y_2)/2$) v) Quotient and remainder based on two integers i and j. ($q = i/j, r = i - q*j$) vi) Area and circumference of a circle (πr^2 & $2\pi r$) 2) Compute all possible roots of a quadratic equation of the form $ax^2+bx+c=0$. 3) Write a C program to arrange three numbers in ascending order using <ol style="list-style-type: none"> i) Ternary operator ii) If statement. 4) Write a C program to <ol style="list-style-type: none"> i) Find the grade of a student by reading marks ii) Convert the given digit into word. 5) Write a C program to implement the arithmetic operations (+,-,*, %) using switch case statement. 6) Write a C program to find the <ol style="list-style-type: none"> i) Factorial of a number ii) G.C.D of two numbers. 7) Write a C program to <ol style="list-style-type: none"> i) To find the sum of individual digits of a given number ii) Reduce the number to a single digit. 8) Write a C program to print <ol style="list-style-type: none"> i) Prime numbers from 1 to n ii) Pascal triangle. 9) Write a C program to find <ol style="list-style-type: none"> i) The largest and smallest number in a list of integers ii) Sum of $1!+2!+3!+\dots+n!$ using while loop. 10) Write a C program to evaluate $1-1/2!+1/3!-1/4!+\dots+1/n!$ using for loop. 11) Write a C program to implement Fibonacci series using do while loop. 12) Write a C program to evaluate the sum of series $1+x/1!+x^2/2!+x^3/3!+\dots+n!$. 13) Write a C program to implement the following <ol style="list-style-type: none"> i) Length of the given string 	

	<ul style="list-style-type: none"> iv) Comparison of two strings v) Concatenation of strings vi) String handling functions (any five) <p>13) Write a C program to check whether the given string is a palindrome or not.</p> <p>14) Write a C program to implement</p> <ul style="list-style-type: none"> i) Matrix addition ii) Matrix multiplication. <p>15) Write a C program to implement factorial of a given number using recursion.</p> <p>16) Write a C program to implement</p> <ul style="list-style-type: none"> i) Employ salary calculation ii) Student percentage Calculation. <p>17) Write a function that returns a union with values of say Basic, DA, HRA etc. at different times based on the argument passed. Compute the salary of the employee in main function after calling the above function repeatedly.</p> <p>18) Write a C program to implement pointer arithmetic.</p> <ul style="list-style-type: none"> i) Write a C program for i) Call by value ii) Call by reference. <p>19) Write a C program to find minimum and maximum values in a given array using pointers.</p> <p>20) Write a C program to display</p> <ul style="list-style-type: none"> i) Five arguments from command line arguments ii) Addition of two numbers using command line arguments. <p>21) Write a C program to implement stacks using arrays.</p> <p>22) Write a C program to implement Queues using Arrays.</p> <p>23) Write a C program to</p> <ul style="list-style-type: none"> i) Convert infix to postfix expression. ii) Evaluate Postfix expression. i) Write a C program to implement i) Linear search ii) Binary search. i) Write a C program to implement i) Bubble sort ii) Selection sort. <p>24) Write a C program to implement Single Lined List operations.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning. 2. Problem Solving and Program Design in C, J.R. Hanly and E.B. Koffman, Fifth Edition, Pearson Ed.
<p>E-Resources</p>	 

13 SH 10P1- ENGLISH LANGUAGE LABORATORY

Course Category	Humanities and Sciences	Credits:	4
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Ability to understand English language Ability to use language in informal situations Minimum ability to perceive things around	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning vocabulary, phonic sounds etc, speaking and communication skills.
Course Content	<p>I. Listening Skills:</p> <ul style="list-style-type: none"> • Listening for Pleasure • Listening for Details • Listening for Information <p>II. Speaking Skills:</p> <ul style="list-style-type: none"> • Introducing Themselves • Phonetics <ol style="list-style-type: none"> 1. Introduction of Sounds- Vowels & Consonants 2. Syllables 3. Inflections 4. Stress & Intonation • Jam • Extempore • Role Plays/ Situational Dialogues & Telephonic Conversations • Presentations • Debates <p>III. Reading Skills:</p> <ul style="list-style-type: none"> • News Paper Reading <p>IV. Writing Skills:</p> <ul style="list-style-type: none"> • Story Writing • Description <ol style="list-style-type: none"> 1. Object 2. Place 3. Person 4. Situation • Information Transfer • Giving Directions & Instructions • Email Writing 	
Text Books and Reference Books:	TEXT BOOKS: <ol style="list-style-type: none"> 1. Using English 2. New Horizons 	

	REFERENCES: <ol style="list-style-type: none">1. Oxford/Cambridge Advanced Learners Dictionary2. Rojet's Thesaurus
E-Resources	 

13 ME 10P1 -WORKSHOP

Course Category	Basic Engineering Course	Credits:	4
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Physical strength General knowledge Knowledge on	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning practical knowledge from Mechanical, Electronic, Computer Science and Engineering labourites in selective areas.
Course Content	<p>CARPENTRY</p> <ol style="list-style-type: none"> 1. Planning sawing and grooving 2. Half lap joint 3. Half Lap Dovetail Joint 4. Mitre Faced Bridle Joint 5. Mortise and Tenon Joint <p>FITTING</p> <p>Straight fitting</p> <ol style="list-style-type: none"> 1. V-fitting 2. Square fitting 3. Semi-circular fitting 4. Dovetail fitting <p>FOUNDRY</p> <ol style="list-style-type: none"> 1. Stepped block 2. Dumb bell 3. Flanged pipe <p>TINSMITHY</p> <ol style="list-style-type: none"> 1. Square tin 2. Circular tin 3. Funnel <p>DEMO</p> <ol style="list-style-type: none"> (a) Metal cutting (b) Welding (c) Black smithy <p>ELECTRICAL WIRING</p> <ol style="list-style-type: none"> 1. (a) One lamp controlled by one switch (b) Two lamps controlled by one switch in Series and Parallel (c) Two lamps controlled by one switch in Series and Parallel combinedly 2. (a) Two lamps controlled by two switches independently (b) One lamp controlled by two two-way switched (staircase connection) <p>IT WORK SHOP</p> <ol style="list-style-type: none"> 1. Assembling a desk top computer 2. Connecting two computers using wire and without wire 3. Preparation of a power point presentation <p>ELECTRONICS</p> <ol style="list-style-type: none"> 1. (a) Identification of components (b) Calculation of values of components like (i) Resistance (ii) Capacitance (iii) Inductance 	

	<ol style="list-style-type: none"> 2. Soldering Practice 3. Operation of CRO <ol style="list-style-type: none"> a. Measurements of Parameters b. Lijjajous Figure
Text Books and Reference Books:	TEXT BOOKS: <ol style="list-style-type: none"> 1. Introduction to computers – Peter Norton
E-Resources	<div data-bbox="432 517 807 546" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="432 546 1042 575" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

Vision and Mission of the INSTITUTE

Vision:

To emerge as a comprehensive Institute that provides quality technical education and research thereby building up a precious human resource for the industry and society.

Mission:

- To provide a learner-centered environment that challenges individuals to actively participate in the education process.
- To empower the faculty to excel in teaching while engaging in research, creativity and public service.
- To develop effective learning skills enabling students to pick up critical thinking thus crafting them professionally fit and ethically strong.
- To reach out industries, schools and public agencies to partner and share human and academic resources.

Vision and Mission of the Department

Vision:

The department is committed to continually improve its educational environment in order to develop graduates with the strong academic and technical backgrounds needed to get distinction in the discipline globally and to achieve academic excellence by imparting in-depth knowledge to the students, facilitating research activities and cater to the ever changing industrial demands and societal needs.

Mission:

- M1:** To encourage students to become self-motivated, problem solving individuals who can find and understand of the knowledge needed to be successful in their profession.
- M2:** To provide intellectual inputs to knowledge-based industries in the form of qualified and trained manpower.
- M3:** To attain self-sustainability and overall development through Research and Consultancy.
- M4:** To produce best quality Computer Science Professionals by imparting quality training, hands on experience and value education.
- M5:** Providing an environment in which students are given the essential resources to address and solve real-world problems, participating in interdisciplinary and multidisciplinary research and its applications.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1:To produce graduates having strong fundamental knowledge in basic sciences and engineering, along with sound principles of computer programming with exposure to Computer Science and Engineering concepts that lead to problem solving techniques.

PEO2:To produce employable graduates who will be placed in various engineering positions in the computational world in firms of international repute.

PEO3:To produce graduates with strong communication skills and work effectively on team-based software development projects and will practice the ethics of their profession consistent with a sense of social responsibility.

PEO4:To pursuit of advanced degrees in engineering at different levels of research and consultancy. They get exposed to several other domains resulting in lifelong learning to broaden their professional knowledge.

PROGRAMME OUTCOMES (POs)

An Engineering Graduate will be able to:

- PO1:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO6:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

13CS2101 - MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Course Category	Mathematics and Basic Sciences	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basic algebra rules and Basic knowledge of connectives is	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding Mathematical Logic & Predicate Logic
	CO2	Understanding Relations and Functions
	CO3	overview on Algebraic systems and its properties
	CO4	studying properties regarding permutations and combinations
	CO5	Briefing Recurrence relations, graphs and traversal techniques
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Mathematical Logic: Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Relations: Properties of binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function, Composition of functions, Lattice and its Properties.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Algebraic Structures: Algebraic systems, Examples and general properties, Semi groups and monoids, groups, and sub groups, homomorphism, Isomorphism. Elementary Combinatorics: Basics of counting, Combinations & Permutations, Binomial and Multinomial theorems, Pigeon-hole principle and its applications.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Recurrence Relations: Generating Functions, Function of Sequences, Calculating Coefficients of generating functions, Recurrence relations, Solving recurrence relation by substitution and Generating functions, the method of Characteristic roots, solution of Inhomogeneous Recurrence Relations.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Graph Theory And Applications: Basic Concepts, Representation of Graphs, cut vertices and edges, covering, matching, independent sets, Planar Graphs, Isomorphism and Sub graphs, DFS, BFS, Spanning Trees, Multi-graphs and Euler circuits, Hamiltonian graphs, Graph coloring.</p>	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> Discrete Mathematical Structures with Applications to Computer Science, J.P.Tremblay, R.Manohar, Mc.Grahill, 2001 	

	<ol style="list-style-type: none"> 2. Discrete Mathematics and its Applications, Kenneth H. Rosen, 6th edition, TMH. 3. Mathematical Foundations of Computer Science, P. Chandrasekharaiah, Prism publications.
	<p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Discrete Mathematics for Computer Scientists & Mathematicians, second edition, J.L. Mott, A. Kandel, T.P. Baker, PHI 2. Discrete Mathematical Structures, Mallik and Sen, Cengage Learning. 3. Discrete Mathematical Structures, Bern and Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education.
E-Resources	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm

13CS2102 - DIGITAL LOGIC DESIGN

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Student needs to have knowledge in basic Boolean algebra rules. Student need to have awareness on different logic gates	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Represent numbers in number systems based on Boolean algebra rules
	CO2	Basics of K-map representation and simplifications
	CO3	Analysis and design of synchronous and sequential circuits
	CO4	Overview on memory management
	CO5	Analysis of asynchronous sequential circuits
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Binary Systems: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes, Binary Storage and Registers, Binary logic.</p> <p>Boolean Algebra And Logic Gates: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions canonical and standard forms, other logic operations, Digital logic gates, integrated circuits.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Gate – Level Minimization: The map method, Four-variable map, Five-Variable map, product of sums simplification Don't-care conditions, NAND and NOR implementation other Two-level implementations, Exclusive – Or function, Hardware Description language (HDL).</p> <p>Combinational Logic: Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor, Decimal Adder, Binary multiplier, magnitude comparator, Decoders, Encoders, Multiplexers, HDL for combinational circuits.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Synchronous Sequential Logic: Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits, HDL for sequential circuits, State Reduction and Assignment, Design Procedures, Registers, Shift Registers, Ripple counters synchronous counters, other counters, HDL for Registers and counters.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Introduction, Random-Access Memory, Memory Decoding, Error Detection and correction Read-only memory, Programmable logic Array programmable Array logic, Sequential Programmable Devices.</p>	

	<p style="text-align: center;"><u>UNIT –V</u></p> <p>Asynchronous Sequential Logic: Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race-Free state Assignment Hazards, Design Example.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. DIGITAL DESIGN – Third Edition, M.Morris Mano, Pearson Education/PHI. 2. FUNDAMENTALS OF LOGIC DESIGN, Roth,5th Edition, Thomson <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill. 2. Switching and Logic Design, C.V.S. Rao, Pearson Education. 3. Digital Principles and Design – Donald D.Givone, Tata McGraw Hill, Edition. 4. Fundamentals of Digital Logic & Micro Computer Design , 5TH Edition, M. Rafiquzzaman John Wiley
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 2px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS2103 - OBJECT-ORIENTED PROGRAMMING THROUGH JAVA

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Students needs to have basics of data types, variables, syntaxes and semantics of programming Control structures syntaxes and working principles is needed.	Sessional Evaluation: 40 Univ.Exam Evaluation: 60 Total Marks: 100	

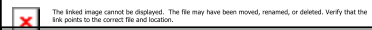
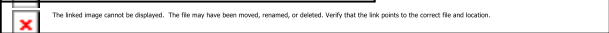
Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Basics of OOPS, Data types and control statements
	CO2	Understanding of Arrays , Strings and Stream Classes
	CO3	Exploring of Inheritance, Polymorphism and Packages
	CO4	Overview of Exception handling and Multithreading
	CO5	Understanding of Applets and Multi-thread programming
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Introduction To OOPS: Overview of Programming, programming, paradigms, Basics of OOP.</p> <p>Introduction To JAVA: History of java, Java Buzz words, Data types, Variables, Scope and Life time of variables, Operators, Expressions, Control statements, Type conversion and casting, Simple java program, Recursion.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Arrays: Declarations and Creation, Accessing array elements, Initialization and accessing values, Multidimensional arrays.</p> <p>String Handling: String, String Buffer classes, String Tokenizer classes.</p> <p>Stream Classes: Input, Output, File input, File output streams.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Inheritance: Types of inheritance, Benefits of inheritance, Member access rules.</p> <p>Constructors: Constructors, Constructor calling sequence.</p> <p>Polymorphism: Method overriding, Method overloading, Abstract classes.</p> <p>Packages And Interfaces: Defining, Creating and accessing a package, Defining an interface, Implementing interface, Extending interfaces.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Exception Handling: Concepts of Exception handling, Benefits of Exception handling, Exception Hierarchy, Usage of Try, Catch, Throw, Throws and Finally, Built in Exceptions, Creating own Exceptions.</p> <p>Multi-Threading: Processes and threads, Life cycle of a thread, Thread methods, Creating and naming a threads, Priority threads, Daemon threads, Thread</p>	

	<p style="text-align: center;"><u>UNIT - V</u></p> <p>Applets: Concepts of applets, differences between Applets and applications, Life cycle of an applet, Creating an applet, Passing parameters to applets.</p> <p>Event Handling: Events, Event classes, Event Listeners, Delegation Event Model, Handling mouse and keyboard Events, Adapter classes, Inner classes.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Java: The Complete Reference, 7th Edition, Herbert Schildt TMH. <p>REFERENCES:</p> <ol style="list-style-type: none"> 2. Slack JM, Programming and problem solving with java, Brook/Cole, 2000. 3. An introduction to java programming and object oriented application development, R A Johson-Thomson. 4. Introduction to java programming 6th Edition, Y Daniel Liang, Pearson Education.
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS2104 - ADVANCED DATA STRUCTURES

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basics of data types, variables, syntaxes and semantics of programming. Knowledge of different data structures is required.	Sessional Evaluation: 40 Univ.Exam Evaluation: 60 Total Marks: 100	

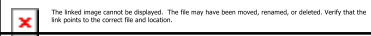
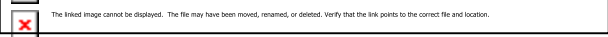
Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning basics of ADT, Singly and doubly linked lists
	CO2	Understanding of Stack & Queue ADTs, Priority Queues
	CO3	Introduction to Trees, Binary trees, Binary search trees
	CO4	Advancement of AVL and Red-Black trees
	CO5	Learning sorting technique
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Concept of ADT, The List ADT-array based implementation and linked list implementation, Single Linked List, Doubly Linked List, Circular Linked list.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>The Stack ADT: array based implementation, linked list implementation, applications of stacks.</p> <p>The Queue ADT: array based implementation, linked list implementation, applications, circular queues, Dequeues.</p> <p>Priority Queues: implementation, Binary heap, applications of priority queues.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Tree: Definition and Properties, ADT.</p> <p>Binary Tree: Definition and Properties, ADT, Implementation, traversals-recursive, non-recursive.</p> <p>Binary Search Tree: Definition and Properties, applications.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Balanced Search Trees: AVL trees: definition, implementation and operations, Red- Black Trees: definition, implementation and operations, 2-3 Trees: definition, implementation and operations. Splay Trees: Definition, implementation and operations.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Heap Sort, shell sort, radix sort, External Sorting- Model for external sorting, Multi-way merge, and Polyphase merge.</p>	

<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Data Structures and Algorithm Analysis in JAVA, Mark Allen Weiss, Pearson Education, Third edition. 2. Data structures Algorithms and Applications, S.Sahni, University press (India) pvt ltd, 2nd edition <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Data Structures Using Java, Yedidyah Langsam, Moshe Augenstein, Aaron M.Tanenbaum, Pearson Education. 2. Data Structures and Algorithms in Java, 2nd edition, M.T.Goodrich and R.Tamassia, John Wiley and Sons, Inc. 3. Data Structures and Algorithms in Java, 2nd edition, A.Drozdek, Thomson. 4. Data Structures and Java Collections Frame Work, W.J.Collins, McGraw Hill. 5. The Complete Reference Java J2SE, 5th Edition, Herbert Schildt, TMH.
<p>E-Resources</p>	 

13CS2105 -FILE STRUCTURES

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Need to have basic knowledge in Files. Need to have knowledge in Input and Output Operations on streams	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100


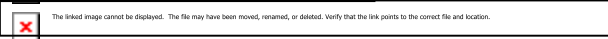
Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Introduction to File structures, records and access methods
	CO2	Learning internal sorting and indexing concepts
	CO3	Basics of multi-level indexing, B-Trees, indexed sequential files
	CO4	Briefing on Hashing techniques
	CO5	Learning file handling functions in C++ and Java
	CO6	overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>File Structure Concepts: Introduction, Files and Record Organization, Record Access, File Access and File Organization, Record structures, Portability and Standardization.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Organizing Files For Performance: Data Compression, Reclaiming Space in Files, Internal Sorting and Key Sorting.</p> <p>Indexing: Index, Index for Entry-Sequenced Files, Selective Indexes, Binding, and Retrieval using combinations of secondary keys.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>B-Trees: B-Tree properties, operations, indexing with Binary Search Trees, Multilevel Indexing, B* Trees, Virtual B-Trees.</p> <p>Indexed Sequential File Access: Introduction, maintaining a sequence set, adding a simple index to the sequence set, separating instead of keys, prefix B+ Trees, B+ Trees.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Hashing: introduction, hashing functions, Record distributions, collision resolution techniques (progressive overflow, double hashing, chained progressive overflow, chaining a separate overflow area, scatter tables) and buckets.</p> <p>Extendible Hashing: introduction, tries, performance, dynamic hashing, linear hashing.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>File related header files in c and C++, File handling functions in c and C++, Reading and writing files in c and C++, File handling related classes in java (File, FileInputStream, FileOutputStream, and RandomAccessFile).</p>	

Text Books and Reference Books:	TEXT BOOKS: 1. File Structures Michael J.Folk. 2. The Complete Reference Java2, Herbert Schildt
E-Resources	 

13SH2103 - PROBABILITY AND STATISTICS

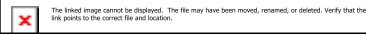
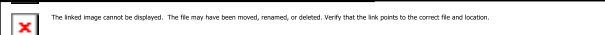
Course Category	Mathematics and Basic Sciences	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Principles of Mathematics, Pre-calculus, Foundations of Mathematics or equivalent skills.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understand the concepts of some Elementary theorems, Axioms of probability
	CO2	Understand the concepts the random variables, distributions
	CO3	Understanding effectively the sampling distribution of the mean proportions and also point estimation
	CO4	Understanding effectively Test of hypothesis and Test of significance, Type – I and Type – II errors
	CO5	Understand linear and non-linear curve fitting, regression lines and coefficient of correlation
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Introduction To Probability: Sample space and events - Axioms of Probability, Some Elementary Theorems, Conditional Probability- Bayes theorem – Discrete and Continuous Probability distributions and distribution functions.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Probability Distribution: Binomial – Poisson and Normal distributions, the normal approximation to the binomial distribution. The expected value of a random variable, Variance of a random variable.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Sampling Distributions: Introduction, population and samples, Sampling distribution, The sampling distribution of the Mean (σ known), sampling distribution of proportions, Sampling distributions of differences and sums – Sampling distribution of mean (σ unknown), Point Estimation- Inferences concerning methods, Interval Estimation- Confidence interval for the mean (σ known), confidence interval for μ (σ unknown). Bayesian Estimation.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Test Of Hypothesis: Test of hypothesis & test of significance -Hypothesis concerning one mean (with known variance σ^2) and two means – type – I and type – II errors. One tail, two tail tests - large sample, Student's t – test, F – test Chi-squared (χ^2) – test.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Curve Fitting: introduction, the method of least squares, linear and non-linear equations .correlation coefficient (ρ). Lines of regression rank correlation coefficient (ρ) (or) spearman's rank-correlation coefficient for grouped data.</p>	

Text Books and Reference Books:	TEXT BOOKS: <ol style="list-style-type: none">1. Probability and for engineers- G.S.S.Bhishma Rao.2. Probability and statistics- T.K.V Nengar, B.Krishna Gandhi, S.Ranga Natham3. Probability and statistics for engineers and scientists- Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers.
E-Resources	 

13CS21P1 - JAVA LABORATORY

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Basics of data types, variables, syntaxes and semantics of programming. Knowledge of different data structures is required.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learn to implement multithreading, exception handling, error resolving mechanisms
Course Content	<ol style="list-style-type: none"> 1. Write a Java program to implement palindrome using Loop Statements using Switch Case 2. Write a program Java program to implement biggest of three numbers using decision statements. 3. Write a Java program to implement Bubble Sort and Selection Sort 4. Write a Java program to implement Factorial using Recursion 5. Write a Java program to implement Arrays Addition and Subtraction. 6. Write a Java program to implement 7. Single level inheritance 8. Write a Java program to implement Multiple inheritance 9. Write a Java program to implement 10. Method Overloading 11. Write a Java program to implement Constructor Overloading 12. Write a Java program to implement Method Overriding 13. Write a Java program to implement Exception Handling 14. Write a Java program to implement Threads 15. Write a Java program to implement Packages 16. Write a Java program to implement Applets 17. Write a Java program to implement String Tokenizer 18. Write a Java program for handling mouse events 	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Java: The Complete Reference, 7th Edition, Herbert Schildt TMH. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Slack JM, Programming and problem solving with java, Brook/Cole, 2000. 2. An introduction to java programming and object oriented application development, R A Johnson-Thomson. 3. Introduction to java programming 6th Edition, Y Daniel Liang, Pearson Education. 	
E-Resources	 	

13CS21P2 -DATA STRUCTURES LABORATORY

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Basics of data types, variables, syntaxes and semantics of programming. Knowledge of different data structures is required.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Implement the concepts of data structures like Stacks, Queues, Trees, and Sorting Techniques.
Course Content	<ol style="list-style-type: none"> 1. Writejava programs to implement the List ADT using arrays and linked lists. Writejava programs to implement the following using Single linked list : <ol style="list-style-type: none"> i) Stack ADT. ii) Queue ADT. 3. Writejava programs to implement the deque(double ended queue) ADT using <ol style="list-style-type: none"> i) Array. ii) Doubly linked list. 4. Write ajava program to implement priority queue ADT. 5. Write java programs to that use recursive and non-recursive functions to traverse the given binary tree in <ol style="list-style-type: none"> i) Preorder. ii) Inorder and iii) Postorder. 6. Write ajava program that performs the following operations: <ol style="list-style-type: none"> i) Insertion into an AVL-Tree. ii) Deletion from an AVL-Tree. 7. Writejava programs for implementing the following sorting methods: <ol style="list-style-type: none"> i) Heap sort ii) Radix 	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Data Structures and Algorithm Analysis in JAVA, Mark Allen Weiss, Pearson Education, Third edition. 2. Data structures Algorithms and Applications, S.Sahni, University press (India) pvt ltd, 2nd edition <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Data Structures Using Java, Yedidyah Langsam, Moshe Augenstein, Aaron M.Tanenbaum, Pearson Education. 2. Data Structures and Algorithms in Java, 2nd edition, M.T.Goodrich and R.Tamassia, John Wiley and Sons, Inc. 3. Data Structures and Algorithms in Java, 2nd edition, A.Drozdek, Thomson. 4. Data Structures and Java Collections Frame Work, W.J.Collins, McGraw Hill. 5. The Complete Reference Java J2SE, 5th Edition, Herbert Schildt, TMH. 	

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NBKR INSTITUTE OF SCIENCE & TECHNOLOGY:: VIDYANAGAR (AUTONOMOUS)
(AFFILIATED TO JNTU ANANTAPUR:NELLORE)

SPSRNELLORE DIST

II YEAR OF FOUR YEAR B.TECH DEGREE COURSE – II SEMESTER

COMPUTER SCIENCE AND ENGINEERING
SCHEME OF INSTRUCTION AND EVALUATION

(With effect from the academic year 2014-2015)



(For the batch admitted in the academic year 2013-2014)

S.No	Course Code	Course Title	Instruction Hours/Week			Credits	Evaluation												
			L	T	D/P		Sessional Test-I		Sessional Test-II		Total Sessional Marks	End Semester Examination		Maximum Total Marks					
							Duration In Hours	Max. Marks	Duration In Hours	Max. Marks		Duration In Hours	Max. Marks						
		THEORY																	
1	13SH2203	Economics and Accountancy	4	-	-	4	2	40	2	40	0.8*Best of two+0.2*least of two	3	60	100					
2	13CS2201	Database Management Systems	4	-	-	4	2	40	2	40		3	60	100					
3	13CS2202	Computer Organization	4	-	-	4	2	40	2	40		3	60	100					
4	13CS2203	Operating Systems	4	-	-	4	2	40	2	40		3	60	100					
5	13CS2204	Software Engineering	4	-	-	4	2	40	2	40		3	60	100					
6	13CE2207	Environmental Studies	4	-	-	4	2	40	2	40		3	60	100					
		PRACTICALS																	
7	13CS22P1	Databases Laboratory			3	2	-	-	-	-	Day to Day Evaluation and a test (40 Marks)	3	60	100					
8	13CS22P2	Operating Systems Laboratory			3	2	-	-	-	-		3	60	100					
		TOTAL	24	-	06	28	-	-	-	-		-	480	800					

13CS2201 - DATABASE MANAGEMENT SYSTEMS

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basic computer concepts such as primary memory, secondary memory, and types of computer users and data.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Introduction and basic DBMS architecture
	CO2	Overview on Database constraints and database languages
	CO3	Types of normal forms with examples
	CO4	Exploring transaction management and concurrency control
	CO5	Introduction to file indexing and tree structure management
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Databases And Database Users: Database approach, its characteristics, and advantages, A brief history of database applications, When not to use a DBMS. Database System Concepts And Architecture: Data models, Schemas, and Instances, Three-schema architecture, Data independence, Database languages Data Modeling Using Entity-Relationship (ER) Model: High level conceptual data models, Entity types, Entity sets, Attributes, Keys, Relationship types, Weak entity types, ER diagrams, Naming conventions, Design issues,</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>The Relational Data Model And Relational Database Constraints: Relational model concepts, Constraints, Schemas, Update operations, Transactions, Dealing with Constraint violations. The Relational Algebra And Relational Calculus: Relational operations, Queries in relational algebra, Tuple relational calculus, Domain relational calculus. SQL-99: Schema definition, Constraints, Queries, and Views</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Functional Dependencies And Normalization For Relational Databases: Informal design guidelines for relation schemas, Functional dependencies, Normal forms, 2nd and 3rd normal forms, Boyce-Codd normal form. Relational Database Design Algorithms And Further Dependencies: Properties of relational decompositions, Multi-valued dependencies, 4th normal form, Join dependencies, 5th normal form.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Concurrency Control Techniques: Two phase locking techniques for concurrency control, Concurrency control based on time stamp ordering, Multi version concurrency control techniques, Validation concurrency control, Granularity of data items and multiple granularity locking.</p>	

	<p style="text-align: center;"><u>UNIT – V</u></p> <p>Database Recovery Techniques: Recovery concepts, Recovery techniques based on deferred update, and immediate update, Shadow paging, ARIES recovery algorithm, Database backup, recovery from catastrophic failures.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Elmasri R, and Navathe S B, Fundamentals of Database Systems, 5th edition, Pearson Education, 2008. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Silberschatz A, Korth H F, and Sudarshan S, Database System Concepts, 5th edition, McGraw-Hill, 2006. 2. Ramakrishnan R, and Gehrke J, Database Management Systems, 3rd edition, McGraw-Hill, 2003. 3. Date C J, An Introduction to Database Systems, 7th edition, Pearson Education, 2000. 4. Rob P, Database Systems – Design, Implementation, and Management, 7th edition, Thomson, 2007.
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS2202- COMPUTER ORGANIZATION

Course Category	Program core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Students require basic knowledge in fundamentals of computer, peripherals of computer, types of memories and etc. Basic Knowledge of internal working of computer is required.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Basics of computers organizations and Machine instructions
	CO2	Understanding the memory system
	CO3	Learning computer arithmetic
	CO4	Overview on processing unit, I/O programs etc
	CO5	Exploring the concept of pipe lining and internal architecture
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Basic Structure Of Computers: Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Machine Instructions And Programs: Numbers, Arithmetic Operations and Characters, Memory Locations and addresses, Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Basic I/O Operations, Subroutines, Additional Instructions</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Memory System: Memory Hierarchy, Basic Concepts, Semiconductor RAM Memories, Read Only Memories, Speed, Size, and Cost, Cache Memories- Mapping Functions, Replacement Algorithms, Performance Considerations, Secondary Storage, RAID.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Computer Arithmetic: Addition and subtraction, multiplication Algorithms, Division Algorithms-Restoring and Non Restoring, Floating – point Arithmetic operations. Decimal Arithmetic unit, Decimal Arithmetic operations.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Basic Processing Unit: Fundamental concepts, Single and multiple bus organization, Hardwired control, Micro-programmed control. I/O Organization: Accessing IO Devices, Interrupts, DMA, Interface Circuits, Standard I/O Interfaces-PCI, SCSI, USB.</p>	

	<p style="text-align: center;"><u>UNIT – V</u></p> <p>Pipelining: Basic concepts, Data hazards, Instruction hazards, Influence on instruction sets, Data path and Control considerations, super scalar operations, performance Considerations</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Computer Organization – Carl Hamacher, Zvonko G. Vranesic, Safwat G. Zaky 2. Computer Systems Architecture – M.Moris Mano, 3rdEdition, Pearson, PHI <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Computer Organization and Architecture– William Stallings, 7thEdition. 2. Computer Organization and Design– P Paul Chowdary, 2ndEdition. 3. Computer Systems Design and Architecture – Vincent P and Harry F Jordan, 2nd Edition.
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">  <small>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</small> </div> <div style="border: 1px solid black; padding: 2px;">  <small>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</small> </div>

13CS2203 - OPERATING SYSTEMS

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Need to have knowledge in fundamentals of computer working. Need to have knowledge in types of software	Sessional Evaluation: 40 Univ.Exam Evaluation: 60 Total Marks: 100	



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Basics of operating systems
	CO2	Understanding the working principle of CPU scheduling
	CO3	Introduction to process synchronization
	CO4	Study of providing memory management techniques
	CO5	Overview on file system management & allocation strategies
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction, Definition, views, OS structure, operations. OS Concepts: Process, Memory and Storage Management, Protection & Security, Computing Environments. System Structures: OS services, interfaces, system calls & types, OS design & Implementation, OS structures.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Process Concepts: Process states, PCB, Process Scheduling, Operations, Interprocess communication. Multithreaded Programming: Multithreading models, Thread libraries, Threading issues, Examples. CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Disk Scheduling algorithms.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Process Synchronization: The Critical-Section Problem, Semaphores, Monitors, Message Passing, Classical IPC problems (Readers-Writers, Dining philosophers and producer & consumer problems). Deadlocks: Resources, Conditions for resource deadlocks, deadlock avoidance, deadlock prevention. Deadlock detection and recovery.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Memory Management Techniques: Introduction, swapping, Contiguous Memory Allocation, Paging, Structure of page table, Segmentation, Examples. Virtual Memory Management: Introduction, Demand Paging, Copy on write, page replacement, Frame allocation, Thrashing, Memory Mapped Files, Kernel Memory allocation, Examples.</p>	

	<p style="text-align: center;"><u>UNIT – V</u></p> <p>File-System Implementation: File-System Structure, File-System Implementation Directory Implementation.</p> <p>I/O Systems: Overview, I/O hardware, Kernel I/O subsystem Case Studies: Linux, Windows XP.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Silberschatz A, Galvin P B , Gagne G, Operating System Principles, 7th Edition, Wiley-India 2004 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Tanenbaum AS, Modern Operating Systems, 3rd Edition, Pearson Education 2008.(for Interprocess Communication, Deadlocks, File Systems and Case studies) 2. Deitel HM, Deitel PJ and Choffnes DR, Operating Systems, 3rd Edition, Pearson Education 2004. 3. Stallings W, Operating Systems – Internals and Design Principles, 5th Edition, Prentice Hall of India 2005
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS2204 - SOFTWARE ENGINEERING

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Knowledge of basic usages of software is needed. Students need to have the Importance of software in a computer	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding the process to be followed in the software development life cycle and process models
	CO2	Learning analysis modelling principles, Design and Coding principles and Requirement Engineering
	CO3	Understanding of building analysis model and design Engg.
	CO4	Understanding of creating architectural design and component level design
	CO5	Analysis of testing strategies and testing tactics
	CO6	Overall Course Outcome.
Course Content	<u>UNIT – I</u>	
	<p>Introduction to Software Engineering: Software evolution, Legacy software, Software myths.</p> <p>A Generic View of Process: Software engineering layers, Process framework, Capability Maturity Model Integration (CMMI), Process patterns, and assessment, Personal software process (PSP), Team software process (TSP) models.</p> <p>Process Models: Prescriptive models, Waterfall model, Incremental model, RAD model, Spiral model, Concurrent development model, Formal methods model, Unified process.</p>	
	<u>UNIT – II</u>	
	<p>Software Engineering Practice: Principles, Communication practices, Planning practices, Analysis modeling principles, Design modeling principles, Coding principle and practice, Testing principles, Deployment.</p> <p>Requirements Engineering: Requirements engineering tasks, Initiation, Eliciting requirements, developing use-cases, Building the analysis model, Negotiating and validating requirements.</p>	
<u>UNIT – III</u>		
<p>Building the Analysis Model: Requirements analysis, Analysis modeling approaches, Data modeling concepts, Object-oriented analysis, Scenario-based modeling, Flow- oriented modeling, Class-based modeling, Creating a behavioral model.</p> <p>Design Engineering: Design process, Design quality, Design concepts, Design model, and Pattern-based software design.</p>		
<u>UNIT – IV</u>		
<p>Creating an Architectural Design: Software architecture, Data design, Architectural styles and patterns, Architectural design, Assessing alternative</p>		

	<p>Mapping data flow into a software architecture.</p> <p>Modeling Component-level Design: Nature of component, Designing class-based components, Conducting component level design, Object constraint language, Designing conventional components.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Testing strategies: A strategic approach to software testing, Test strategies for conventional software, Test strategies for object-oriented software, Validation testing, System testing, Art of debugging.</p> <p>Testing Tactics: Software testing fundamentals, Black-box and white-box testing, Basis path testing, Control structure testing, Object-oriented testing methods, Class level testing methods, Testing patterns.</p>
<p>Text Books and Reference Books:</p>	<p>TEXTBOOKS:</p> <ol style="list-style-type: none"> 1. Pressman R S, Software Engineering-A Practitioner’s Approach, 6th edition, McGraw-Hill, 2005 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Sommerville I, Software Engineering, 5th edition, Pearson Education, 1996. 2. Jawadekar W S, Software Engineering – Principles and Practice, Tata McGraw- Hill, 2004. 3. Forouzan A, and Hudson F J, Software Engineering Fundamentals, Oxford University Press, 1996
<p>E-Resources</p>	<div data-bbox="437 969 810 1003" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="437 1003 1046 1043" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13SH2203 - ECONOMICS & ACCOUNTANCY

Course Category	Humanities and Social Sciences	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basic terminology regarding economics like demand, market, consumer, production and etc.,	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	An ability to define, analyze and identify the appropriate solution to a business problem using sound economic and accounting
	CO2	Able to know the role of various cost concepts in managerial decisions and also the managerial uses of production function
	CO3	Able to understand to take price and output decisions under various market structures
	CO4	Able to know in brief formalities to be fulfilled to start a business organization
	CO5	Able to analyze the firm's financial position with the techniques of economic aspects as well as financial analysis
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Demand Analysis: Definition and basic concepts of Economics – Consumer's Equilibrium: Marginal Utility Analysis - the concept of Demand - Law of demand – Elasticity Of Demand: Types, determinants and its importance.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Theory Of Production And Cost: Production function – Cobb – Douglas production function and its properties – Law of variable proportions – Law of Returns to Scale – Cost concepts – Revenue curves – Break-Even Analysis.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Theory Of Pricing: Classification of markets – Pricing under perfect Competition – Pricing under Monopoly – Price discrimination – Monopolistic Competition.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Types Of Business Organizations: Sole tradership, partnership and Joint Stock Companies – Formation of companies - Shares and debentures.</p> <p style="text-align: center;"><u>UNIT - V</u></p> <p>Financial & Management Accounting: Concepts and principles, Journal and Ledger, Trial Balance, Final Accounts: Trading account, Profit and Loss account and Balance Sheet.</p> <p>Basic Concepts In Capital Budgeting Process And Methods – Working Capital: operating cycle, factors and sources.</p>	

<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Managerial Economics and Financial Analysis: A R Aryasri 2. Management Accounting : SN Maheswari 3. Economic Analysis : K. Sankaran <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Double entry book keeping : Battlibai 2. Cost Accounting : Jain and Narang
<p>E-Resources</p>	<div data-bbox="437 450 810 479" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="437 479 1048 517" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CE2207 - ENVIRONMENTAL STUDIES

Course Category	Humanities and Social Sciences	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Knowledge of different components of environment	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	understand the various components of environment
	CO2	Understanding the value of natural resources
	CO3	Understand environment pollution & suggested measures
	CO4	Identify several environmental problems in India and way to minimize the effects
	CO5	Knowing the environmental protection laws in our country and understand the need to respect those laws
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction: Definition, Scope and Importance of Environmental studies, Environmental components. ECOSYSTEM: Introduction, types, characteristics, features, structure and functions of Ecosystems.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Environment And Natural Resources Management: Land Resources and its importance, Land degradation, soil erosion and desertification. Effects of modern agriculture, fertilizer and pesticide problems. Forest Resources: Use and over-exploitation – Mining and dams-their effects on forest and tribal people. WATER RESOURCES: Use and over-utilization of surface and ground water, Floods and droughts. Water logging and salinity, Conflicts over water sharing, Rain water harvesting, clouds seeding and watershed management.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Environmental Pollution: Local and global issues, Causes, Effects and control measures of Air pollution, Water Pollution, soil Pollution, Marine Pollution, Noise pollution. Solid Waste Management: Composing, vermiculture – Urban and industrial wastes.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Environmental Problems In India: Drinking water, sanitation and public health. Effects of urbanization, transportation, Industrialization on the quality of environment, Green revolution.</p>	

	<p style="text-align: center;"><u>UNIT – V</u></p> <p>Environmental Acts: Water (Prevention and control of pollution) Act- Air(Prevention and control of pollution) Act- Environment protection Act, Wildlife protection Act, Forest conservation Act, Coastal Zone Regulations</p> <p>Case Studies: Silent Valley Project, Madhura Refinery and TajMahal, Tehri Dam, Kolleru lake- aquaculture, Fluorosis in Andhra Pradesh.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Principles of Environmental Studies, Manoharanachari C, Jayaramaredy P 2. Environmental Science, Chandra Sekhar M 3. Perspectives in Environmental studies, Kaushik A, Kaushik C P 4. Introduction of Environmental Science, Anjaneyulu Y 5. Environmental Biology, Agarwal K C 6. Environmental Encyclopedia, Cunningham W P, Cooper T H, Gorhani E, and Hepworth M T 7. Down to Earth , Science and Environmental Monthly Magazine Centre for Science & Environmental 8. Hand book of Environmental laws, rules. Guidelines Compliances and Standards Vol I & II, Trivedy R K
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS22P1 - DATABASES LABORATORY

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Basic computer concepts such as primary memory, secondary memory, and types of computer users and data.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learn to implement PL/SQL programs to create triggers, Cursors, Procedures, Functions
Course Content		<ol style="list-style-type: none"> 1) Creation, altering and dropping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command. 2) Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints. 3) Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views. 4) Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date) 5) a) Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found) b) Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block. 6) Develop a program that includes the features NESTED IF, CASE and CASE expression. 7) Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions 8) Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES. 9) Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions. 10) Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables. 11) Develop Programs using BEFORE and AFTER Triggers, Row and
Text Books and Reference Books:		REFERENCES: <ol style="list-style-type: none"> 1. ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc- Graw Hill.

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13CS22P2 - OPERATING SYSTEMS LABORATORY

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Need to have knowledge in fundamentals of computer working. Need to have knowledge in types of software	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Implementation of Deadlock detection and avoidance, priority Algorithms, CPU scheduling and so on.
Course Content	<p>1) Simulate the following CPU scheduling algorithms</p> <p style="margin-left: 40px;">a) Round Robin</p> <p style="margin-left: 40px;">b) SJF</p> <p style="margin-left: 40px;">c) FCFS</p> <p style="margin-left: 40px;">d) Priority</p> <p>2) Simulate all file allocation strategies</p> <p style="margin-left: 40px;">a) Sequential</p> <p style="margin-left: 40px;">b) Indexed</p> <p style="margin-left: 40px;">c) Linked</p> <p>3) Simulate Multiprogramming with variable number of tasks (MVT) and Multiprogramming with fixed tasks (MFT).</p> <p>4 Simulate Bankers Algorithm for Dead Lock Avoidance.</p> <p>) Simulate Bankers Algorithm for Dead Lock Prevention</p> <p>5 Simulate all page replacement algorithms</p> <p>)</p> <p style="margin-left: 40px;">a) FIFO</p> <p>6</p> <p style="margin-left: 40px;">b) LRU</p> <p>)</p> <p style="margin-left: 40px;">c) LFU Etc. ...</p> <p style="margin-left: 40px;">Simulate Paging Technique of memory management.</p> <p>7)</p>	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <p>1. Silberschatz A, Galvin P B , Gagne G, Operating System Principles, 7th Edition, Wiley-India 2004</p> <p>REFERENCES:</p> <p>1. Tanenbaum AS, Modern Operating Systems, 3rd Edition, Pearson Education 2008.(for Interprocess Communication, Deadlocks, File Systems and Case studies)</p> <p>2. Deitel HM, Deitel PJ and Choffnes DR, Operating Systems, 3rd Edition, Pearson Education 2004.</p>	

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Vision and Mission of the INSTITUTE

Vision:

To emerge as a comprehensive Institute that provides quality technical education and research thereby building up a precious human resource for the industry and society.

Mission:

- To provide a learner-centered environment that challenges individuals to actively participate in the education process.
- To empower the faculty to excel in teaching while engaging in research, creativity and public service.
- To develop effective learning skills enabling students to pick up critical thinking thus crafting them professionally fit and ethically strong.
- To reach out industries, schools and public agencies to partner and share human and academic resources.

Vision and Mission of the Department

Vision:

The department is committed to continually improve its educational environment in order to develop graduates with the strong academic and technical backgrounds needed to get distinction in the discipline globally and to achieve academic excellence by imparting in-depth knowledge to the students, facilitating research activities and cater to the ever changing industrial demands and societal needs.

Mission:

- M1:** To encourage students to become self-motivated, problem solving individuals who can find and understand of the knowledge needed to be successful in their profession.
- M2:** To provide intellectual inputs to knowledge-based industries in the form of qualified and trained manpower.
- M3:** To attain self-sustainability and overall development through Research and Consultancy.
- M4:** To produce best quality Computer Science Professionals by imparting quality training, hands on experience and value education.
- M5:** Providing an environment in which students are given the essential resources to address and solve real-world problems, participating in interdisciplinary and multidisciplinary research and its applications.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1:To produce graduates having strong fundamental knowledge in basic sciences and engineering, along with sound principles of computer programming with exposure to Computer Science and Engineering concepts that lead to problem solving techniques.

PEO2:To produce employable graduates who will be placed in various engineering positions in the computational world in firms of international repute.

PEO3:To produce graduates with strong communication skills and work effectively on team-based software development projects and will practice the ethics of their profession consistent with a sense of social responsibility.

PEO4:To pursuit of advanced degrees in engineering at different levels of research and consultancy. They get exposed to several other domains resulting in lifelong learning to broaden their professional knowledge.

PROGRAMME OUTCOMES (POs)

An Engineering Graduate will be able to:

- PO1:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO6:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**NBKRINSTITUTE OF SCIENCE & TECHNOLOGY:: VIDYANAGAR (AUTONOMOUS)
(AFFILIATED TO JNTU ANANTAPUR:NELLORE)**

SPSRNELLORE DIST

III YEAR OF FOUR YEAR B.TECH DEGREE COURSE – I SEMISTER

**COMPUTERSCIENCE AND ENGINEERING
SCHEME OF INSTRUCTION AND EVALUATION**



(With effect from the academic year 2015-2016)
(For the batch admitted in the academic year 2013-2014)

S.No	Course Code	Course Title	Instruction Hours/Week			Credits	Evaluation								
							Sessional Test-I		Sessional Test-II		Total Sessional Marks	End Semester Examination		Maximum Total Marks	
			THEORY				L	T	D/P	Duration In Hours		Max. Mark	Duration In Hours		Max. Mark
1	13CS3101	Design and Analysis of Algorithms	4	-	-	4	2	40	2	40		3	60	100	
2	13CS3102	Data Communications and Computer Networks	4	-	-	4	2	40	2	40		3	60	100	
3	13CS3103	Principles of Programming Languages	4	-	-	4	2	40	2	40		3	60	100	
4	13CS3104	Object Oriented Analysis and Design	4	-	-	4	2	40	2	40		3	60	100	
5	13CS3105	Theory Of Computation	4	-	-	4	2	40	2	40		3	60	100	
6	13CS3106	Software Project Management	4	-	-	4	2	40	2	40		3	60	100	
PRACTICALS															
7	13CS31P1	Object Oriented Analysis and Design Laboratory			3	2	-	-	-	-	Dayto Day Evaluation and a test (40 Marks)	3	60	100	
8	13SH31P1	Advanced Communication Skills Laboratory			3	2	-	-	-	-		3	60	100	
TOTAL			24	-	06	28	-	-	-	-		-	480	800	

13CS3101 - DESIGN AND ANALYSIS OF ALGORITHMS

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Discrete mathematical structures and Data	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

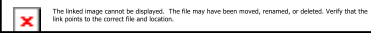

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning the analysis of algorithms, Divide and Conquer rules
	CO2	Learning greedy strategies and Dynamic programming
	CO3	Briefing on backtracking and graph colouring methods
	CO4	Exploring branch and bound strategies
	CO5	Overview on NP-hard and NP-complete problems
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Introduction: Algorithm, Algorithm Specification, Space Complexity, Time Complexity, Asymptotic notation. Divide and Conquer: General Method, Merge Sort, Quick Sort, Binary Search, and Strassen’s Matrix Multiplication.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Greedy Method: General Method, Knapsack Problem, Optimal Storage on Tapes, Minimum cost Spanning Trees, Single-Source Shortest Paths. Dynamic Programming: General Method, Multistage Graphs, 0/1 Knapsack Problem, Reliability Design Problem.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Back Tracking: General Method, Graph Coloring, 8-Queen’s problem, Knapsack Problem. Basic Traversal & Search Techniques: Techniques for Binary Trees and Graphs, Connected Components and Spanning Tress, Bi-Connected Components and DFS.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Branch and Bound: General Method, FIFO Branch and Bound, LC Branch and Bound, 0/1 Knapsack Problem, Travelling Sales Person Problem. Lower Bound Theory: Comparison Tress, Lower Bounds through Reductions (Finding the Convex Hull, Disjoint Sets Problem, Inverting Lower Triangular Matrices)</p> <p style="text-align: center;"><u>UNIT –V</u></p> <p>NP-Hard and NP-Complete Problems: Basic Concepts, NP-Hard Problems (Cliques Decision Problem, Chromatic Number Decision Problem, And/or Graph</p>	

	<p>PRAM Algorithms: Introduction, Computational Model, Fundamental Techniques and Algorithms.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Fundamentals of Computer Algorithms --Ellis Horowitz, Sartaj Sahni, S Rajasekharan, Golgotha Publications (2nd Edition) 2007. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Introduction to the Design & Analysis of Algorithms -- Levitin A, Pearson Education, 2003. 2. Introduction to algorithms, Cormen T H, Leiserson C E, Rivest R L, and Stein C, 2nd edition, Prentice-Hall of India,2001. 3. Fundamentals of Sequential and parallel Algorithms, Berman K A, and Paul J L, Thomson Brook/Cole, 1997
<p>E-Resources</p>	<div data-bbox="437 651 810 685" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="437 685 1048 719" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS3102 -DATA COMMUNICATIONS AND COMPUTER NETWORKS

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Principles of Operating Systems	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding the data communications systems
	CO2	Understanding basics of computer networks
	CO3	Familiarization with the taxonomy of the networking area
	CO4	Introduction to advanced networking concepts
	CO5	Gain expertise in application areas of networking
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction: Network applications, network hardware, network software, Reference models: OSI and TCP/IP.</p> <p>The Physical Layer: Theoretical basis for communication, Transmission impairments, Channel Capacity, Transmission Media: Guided and Unguided, Signal encoding techniques.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>The Data Link Layer: Design issues, Error detection and correction, Elementary data link protocols, Sliding window protocols, Example data link protocols - HDLC, The data link layer in the internet.</p> <p>The Medium Access Sublayer: Channel allocations problem, multiple access protocols, Ethernet, Data Link Layer switching, Wireless LAN, Broadband Wireless, Bluetooth.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>The Network Layer: Network layer design issues, Routing Algorithms, Congestion control algorithms, Internetworking, The network layer in the internet (IPv4 and IPv6), Quality of Service.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>The Transport Layer: Transport services, elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP.</p> <p style="text-align: center;"><u>UNIT -V</u></p> <p>The Application Layer: Domain name system, electronic mail, World Wide Web. Application Layer Protocols: HTTP, SNMP, FTP, SMTP.</p>	

Text Books and Reference Books:	TEXT BOOKS: 1. A.S. Tanenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, New Delhi, India REFERENCES: 1. Behrouz A. Forouzan (2006), Data communication and Networking, 4thEdition, Mc.Graw-Hill
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13CS3103 - PRINCIPLES OF PROGRAMMING LANGUAGES

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basic Data Structures and Object-Oriented Design and Advanced Data Structures	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

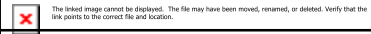

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	overview on Programming domain, language evolution
	CO2	Basics of Data types, binding, expressions and overloading
	CO3	Overview on subprograms and its implementation
	CO4	Introduction to Data Abstraction and encapsulation
	CO5	Exploring exception handling and functional languages
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Preliminaries: Programming Domains, Language Evaluation Criteria, Influences on Language Design, Language Categories, Language Design Tradeoffs Implementation methods and programming environments.</p> <p>Describing Syntax and Semantics: Formal methods of describing Syntax, Attribute Grammars and Dynamic Semantics.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Data Types: Primitive data types, Character string types, User-defined ordinal types, Array types, Associative arrays, Record types, Union types, Pointer and reference types.</p> <p>Expression statements and Assignment statements: Arithmetic expressions, Overloaded operators, Type conversions, Relational and Boolean expressions, Short- Circuit evaluation, Assignment statements, Mixed mode assignment.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Subprograms: Fundamentals, Design issues, Local referencing environments, Parameter passing methods, Parameters that are subprogram names, Overloaded subprograms, Generic subprograms, Design issues for functions, User- defined Overloaded Operators, Co routines.</p> <p>Implementing Subprograms: General Semantics of calls and returns, implementing simple subprograms, implementing subprograms with stack-dynamic local variables.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Abstract Data Types & Encapsulation Constructs: Concepts of abstraction, Data Abstraction, Design issues, Language Examples, Parameterized Abstract data types, Encapsulation Constructs, Naming Encapsulations.</p> <p>Support for OOP: Object Oriented Programming, Design Issues for OOL, Support for OOP in Smalltalk, C++, Java, C#, Ada95, Ruby and Object model of JavaScript, Implementation of Object Oriented constructs.</p>	

	<p style="text-align: center;"><u>UNIT - V</u></p> <p>Exception Handling: Introduction to Exception Handling, Exception handling In Ada, C++, Java.</p> <p>Functional Programming Languages: Mathematical functions Fundamentals of functional programming languages, introduction to LISP, Scheme. Applications of functional programming languages, Comparison of imperative languages.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Sebesta RW, Concepts of programming languages, 8th edition, Pearson Education 2008. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Louden KC, Programming Languages - Principles and Practice, 2nd edition, Cenage Learning 2003. 2. Tucker AB, Noonan RE, Programming Languages - Principles and Paradigms, 2nd edition, TMH 2007. 3. Pratt TW, Zelkowitz MV, and Gopal TV, Programming Languages - Design and Implementation, 4th edition, Pearson Education 2006. 4. Ghezzi C. Jazayeri M, Programming Language Concepts, 3rd edition, Wiley- India 1998.
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS3104 - OBJECT ORIENTED ANALYSIS AND DESIGN

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Object Oriented Programming through Java	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	UML basics and SDLC
	CO2	Brief overview on advanced structural modelling
	CO3	Overview on class and object diagrams
	CO4	Exploring behavioral modeling
	CO5	overview on architectural modelling
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction the UML: The importance of modeling, Principles of modeling, Object oriented modeling, A conceptual model of the UML, Architecture, Software Development Life Cycle.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Basic Structural Modeling: Classes, Relationships, Common Mechanisms and Diagrams. Advanced Structural Modeling: Advanced Classes, Advanced Relationships, Interfaces, Types and Roles, Packages.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Class & Object Diagrams: Terms and Concepts, Common Modeling techniques for Class & Object Diagrams.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Basic Behavioral Modeling: Interactions, Interaction diagrams, Use cases, Use case diagrams, Activity diagrams.</p> <p style="text-align: center;"><u>UNIT - V</u></p> <p>Advanced Behavioral Modeling: Events and Signals, State machines, Process and Threads, Time and Space, State chart diagrams. Architectural Modeling: Components, Deployment, Component diagrams and Deployment diagrams.</p>	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modelling Language User Guide, Pearson Education. 	

	<p>REFERENCES:</p> <ol style="list-style-type: none">1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.2. Pascal Roques: Modelling Software Systems Using UML2, WILEY-Dreamtech India Pvt.Ltd.3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies
E-Resources	 <p>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</p>  <p>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</p>

13CS3105 - THEORY OF COMPUTATION

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basic Data Structures and Object-Oriented Design and Mathematics for	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Fundamentals of Finite automata
	CO2	Learning the basics of regular languages and their properties
	CO3	Exploring CFL and its properties
	CO4	Brief overview on Push down automata
	CO5	Learning Turing machines, undecidability and PDA.
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Fundamentals: Strings, Alphabet, Language, Finite State Machine, Definitions, Finite Automaton model, Acceptance of Strings and languages, Deterministic Finite Automaton and non-deterministic finite automaton.</p> <p>Finite Automata: NFA with epsilon transitions- uses of epsilon transitions, Conversions and Equivalence- Equivalence between NFA with and without epsilon transitions, NFA to DFA conversion.</p> <p>Finite Automata With Output-MOORE and MEALY machines.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Regular Languages: Regular expressions, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions, Algebraic Laws for Regular Expressions.</p> <p>Properties Of Regular Languages: Proving languages not to be regular, closure properties of regular languages, Equivalence and Minimization of Automata.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Context Free Grammars And Languages: Context free grammars, parse trees, Ambiguity in Grammars and languages.</p> <p>Properties Of Context Free Languages: Normal Forms for context free grammars, the pumping lemma for context free languages, closure properties of context free languages</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Push Down Automata: Definition of Push down automata, Acceptance of CFL- Acceptance by final state and Acceptance by empty stack, Equivalence of CFG and PDA- From Grammars to PDA, From PDA's to Grammars, Deterministic PDA.</p>	

	<p style="text-align: center;"><u>UNIT –V</u></p> <p>Turing Machine: Definition, model, Design of TM, Recursively Enumerable Languages. Church's hypothesis, counter machine, Types of Turing machines, Universal Turing Machine. Linear bounded automata and context sensitive language, Chomsky hierarchy of languages.</p> <p>Undecidability: A Language that is not Recursively Enumerable, Undecidable problems about Turing Machine, Post's Correspondence problem, other undecidable problems</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Hopcroft J E, Motwani R And Ullman J D An Introduction To Automata Theory, Languages And Computation 3rd edition, Pearson education <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Azad S K, Theory of Computation – An Introduction to Automata, Formal Languages and Computability, Dhanpat Rai Publications. 2. Cohen D I, An Introduction To Computer Theory, 2nd edition, John Wiley 3. LINZ P, An Introduction to Formal Languages and Automata 2nd edition. 4. Martin J C Introduction to languages and the theory of computation 3rd edition, Tata McGraw Hill
<p>E-Resources</p>	<div data-bbox="437 902 810 943" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="437 943 1046 981" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS3106 - SOFTWARE PROJECT MANAGEMENT



Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Software Engineering	Sessional Evaluation:	40
		Univ.Exam Evaluation:	60
		Total Marks:	100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Introduction to SPM and Project planning
	CO2	Learning project schedules and reviews
	CO3	Overview on software requirements and design
	CO4	Describing Software testing and change Management
	CO5	Exploring management, leadership and process improvement
	CO6	Overall Course Outcome
Course Content	<u>UNIT - I</u>	
	<p>Introduction: Tell Everyone the Truth All the Time, Trust Your Team, Review Everything, Test Everything, All Software Engineers Are Created Equal, Doing the Project Right Is Most Efficient.</p> <p>Software Project Planning: Understand the Project Needs; Create the Project Plan, Diagnosing Project Planning Problems. Estimation: Elements of a Successful Estimate, Wideband Delphi Estimation, Other Estimation Techniques, Diagnosing Estimation Problems.</p>	
	<u>UNIT - II</u>	
	<p>Project Schedules: Building the Project Schedule, Managing Multiple Projects, Use the Schedule to Manage Commitments, Diagnosing Scheduling Problems. Reviews: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming, Use Inspections to Manage Commitments, Diagnosing Review Problems.</p>	
	<u>UNIT - III</u>	
<p>Software Requirements: Requirements Elicitation, Use Cases, Software Requirements Specification, Change Control, Introduce Software Requirements Carefully, Diagnosing Software Requirements Problems. Design And Programming: Review the Design, Version Control with Subversion, Refactoring, Unit Testing, Use Automation, Be Careful with Existing Projects, Diagnosing Design and Programming Problems.</p>		
<u>UNIT - IV</u>		
<p>Software Testing: Test Plans and Test Cases, Test Execution, Defect Tracking and Triage, Test Environment and Performance Testing, Smoke Tests, Test Automation, Postmortem Reports, Using Software Testing Effectively, Diagnosing Software Testing Problems. Understanding Change: Why Change Fails, How to Make Change Succeed.</p>		

	<p style="text-align: center;"><u>UNIT - V</u></p> <p>Management And Leadership: Take Responsibility, Do Everything Out in the Open, Manage the Organization, Manage Your Team. Managing An Outsourced Project: Prevent Major Sources of Project Failure, Management Issues in Outsourced Projects, Collaborate with the Vendor. Process Improvement: Life Without a Software Process, Software Process Improvement, Moving Forward</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Applied Software Project Management by Andrew Stellman and Jennifer Greene, O'Reilly, 2005 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Quality Software Project Management By Robert T. Futrell, Donald F. Shafer, Linda I. Safer, PHI, 2002 2. Software Project Management in Practice By Pankaj Jalote, Addison Wesley, 2002
<p>E-Resources</p>	<div data-bbox="437 770 810 801" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="437 801 1050 837" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS31P1- OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY

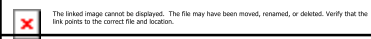

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Object Oriented Programming through Java	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Implementation of UML diagrams using Umbrella software
Course Content	<p>Draw the UML diagrams for</p> <ol style="list-style-type: none"> 1. Student Marks Analysis System. 2. Payroll System. 3. ATM System. 4. Medical Expert System. 5. Quiz System. 6. Course Registration System. 7. Stock Maintenance System. 8. Online Railway Ticket Reservation System. 9. Library Management System. 10. Order Processing System. 	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modelling Language User Guide, Pearson Education. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education. 2. Pascal Roques: Modelling Software Systems Using UML2, WILEY-Dreamtech India Pvt.Ltd. 3. Atul Kahate: Object Oriented Analysis 	
E-Resources	<div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>	

13SH31P1 - ADVANCED COMMUNICATION SKILLS LABORATORY

Course Category	Humanities and Social Sciences	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Comprehending the basic level of comprehensions. Intermediate level of error analysis. Ability to use appropriate language in informal	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning advanced communication skills and some group discussions
Course Content		<ol style="list-style-type: none"> 1. Vocabulary Building – Synonyms and Antonyms, Word roots, One-word Substitutes, Prefixes and Suffixes, Study of word origin, Analogy, Idioms and Phrases. 2. Group Discussion – Dynamics of Group Discussion, Intervention, Summarizing, Modulation of voice, Body Language, Relevance, Fluency and Coherence. 3. Intrapersonal & Interpersonal Relationship Skills - Intrapersonal & Interpersonal Relationship Skills - To be an Effective Team Player 4. Resume' Writing – Structure and Presentation, Planning, Defining the career Objective, Projecting ones strengths and Skill-Sets, Summary, Formats and Styles, Letter-Writing. 5. Interview Skills – Concept and Process, Pre-Interview Planning, Opening Strategies, Answering Strategies, Interview through Tele and Video-Conferencing. 6. Corporate Etiquettes- Dressing Etiquettes- Dining Etiquettes- Nonverbal Communication- Proximity of Place
Text Books and Reference	TEXT BOOKS: <ol style="list-style-type: none"> 1. Using English 2. New Horizons 	

Books:	REFERENCES: <ol style="list-style-type: none"><li data-bbox="432 174 1078 208">1. Oxford/Cambridge Advanced Learners Dictionary<li data-bbox="432 210 703 244">2. Rojet's Thesaurus.
E-Resources	 

**NBKR INSTITUTE OF SCIENCE & TECHNOLOGY:: VIDYANAGAR(AUTONOMOUS)
(AFFILIATED TO JNTU ANANTAPUR:NELLORE)**

SPSR NELLORE DIST

III YEAR OF FOUR YEAR B.TECH DEGREE COURSE – II SEMISTER

**COMPUTER SCIENCE AND ENGINEERING
SCHEME OF INSTRUCTION AND EVALUATION**

(With effect from the academic year 2015-2016)

(For the batch admitted in the academic year 2013-2014)



S.No	Course Code	Course Title	Instruction Hours/Week			Credits	Evaluation											
			L	T	D/P		Sessional Test-I		Sessional Test-II		Total Sessional Marks	End Semester Examination		Maximum Total Marks				
							Duration In Hours	Max. Mark	Duration In Hours	Max. Mark		Duration In Hours	Max. Mark					
		THEORY																100
1	13CS3201	Computer Graphics	4	-	-	4	2	40	2	40	0.8*Best of two+0.2*least of two	3	60	100				
2	13CS3202	Cryptography and Network Security	4	-	-	4	2	40	2	40		3	60	100				
3	13CS3203	Free & Open-Source Software	4	-	-	4	2	40	2	40		3	60	100				
4	13CS3204	Compiler Design	4	-	-	4	2	40	2	40		3	60	100				
5	13EC3201	Microprocessors & Interfacing	4	-	-	4	2	40	2	40		3	60	100				
6	13CS32E1	Mobile Computing	4	-	-	4	2	40	2	40		3	60	100				
		PRACTICALS																
7	13CS32P1	FOSS Laboratory			3	2	-	-	-	-	Day to Day Evaluation and a test (40 Marks)	3	60	100				
8	13EC32P1	Microprocessors Laboratory			3	2	-	-	-	-		3	60	100				
		TOTAL	24	-	06	28	-	-	-	-		-	480	800				

Course Code	Course Title	Instruction Hours/Week			Credits
		L	T	P	
	Elective - I				
13CS32E1	Mobile Computing	4			4
13CS32E2	Neural Networks	4			4
13CS32E3	Grid Computing	4			4
13CS32E4	Distributed Operating Systems	4			4

13CS3201 - COMPUTER GRAPHICS

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Data structures and C programming	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Introduction to CG and raster scanning algorithms
	CO2	Description of graphics Hardware, Geometrical transformation
	CO3	Learning different views in 3D, Curves and surfaces
	CO4	Exploring solid modelling, visible surface determination
	CO5	Overview on illumination, shading and animation
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction: Definition, Advantages of Interactive Graphics, Representative uses of Computer Graphics, Classifications of Applications, Development of Hardware and Software for Computer Graphics, Conceptual Frame work for Interactive Graphics. Basic Raster Graphics algorithms for Drawing 2-D Primitives: Overview, Scan Conversion of lines, Circles, Ellipse, Filling Polygons, Generating Characters, Anti- aliasing.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Graphics Hardware: Hard copy Technologies, Soft copy Technologies, Raster Scan display system, Random Scan display system, Input devices for Operator Interaction. Geometrical Transformation: 2D Transformations, Homogeneous Co-ordinates and Matrix representation of 2D Transformations, Composition of 2D Transformations and Window-to-View port Transformations.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Viewing in 3D: Definition of Projections, Types of Projections and example of Projections. Co-ordinate Systems Representing Curves and Surfaces: Polygon Meshes, Parametric Cubic Curves, Parametric Bi-Cubic Surfaces, Quadric Surfaces.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Solid Modeling: Representing Solids, Regularized Boolean Set Operations, Primitive Instancing, Sweep Representation, Boundary Representation, Spatial Partitioning Representation, Comparison of Representation. Visible Surface Determination: Functions of two Variables, Techniques for efficient Visible Surface Algorithms, Z-Buffer algorithm, List Priority algorithm, Scan Line algorithm, Visible Surface Ray Tracing.</p>	

	<p style="text-align: center;"><u>UNIT - V</u></p> <p>Illumination and Shading: Illumination models, Shading models for polygons, Surface Details, Shadows, Transparency.</p> <p>Animation: Define Animation, Conventional and Computer assisted Animation, Animation Languages, Methods for Controlling Animation, Basic rules of Animation.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Computer Graphics Principles and Practice Second edition by James D.Foley, Andries Van Dam, Steven K.Feiner, John F.Hughes. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Computer Graphics with OpenGL, Donald D. Hearn, M. Pauline Baker. Prentice Hall; 3rd edition 2003. 2. Computer Graphics, Zhigaud Xiang, TMH, 2nd Edition.
<p>E-Resources</p>	<div data-bbox="435 734 810 768" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="435 768 1048 808" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS3202 - CRYPTOGRAPHY & NETWORK SECURITY

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Computer Networks and Introduction to Algorithms	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Basics of security mechanisms & supporting techniques
	CO2	Overview on public key cryptography
	CO3	Describing the advantage of number theory and its usage
	CO4	Exploring various authentication techniques
	CO5	Briefing on IP security and web security
	CO6	Overall course outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction: Attacks, Services and Mechanisms, Security attacks, Security services, A Model for Internetwork Security. Classical Techniques. Conventional Encryption: Conventional Encryption model, steganography, Classical Encryption Techniques, Placement of Encryption function. Modern Techniques: Simplified DES, Block Cipher Principles, Data Encryption Standard, Strength of DES, triple DES, Block Cipher Design Principles and Modes of operations.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Public Key Cryptography: Key distribution, Random Number Generation. Traffic confidentiality, RSA Algorithm, Principles, Key Management, Diffie-Hellman Key exchange, Elliptic Curve Cryptography.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Number theory: Prime and Relatively prime numbers, Modular arithmetic, Fermat's and Euler's theorems, Testing for primality, Euclid's Algorithm, the Chinese remainder theorem, Discrete logarithms.</p> <p>Message authentication and Hash functions: Authentication requirements and functions, Message Authentication, Hash functions, Security of Hash functions and MACs.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Hash and Mac Algorithms: MD File, Message Digest Algorithm, Secure Hash Algorithm, H MAC.</p> <p>Digital signatures and Authentication protocols: Digital signatures, Authentication Protocols, Digital signature standards. Authentication Applications: Kerberos, X.509 directory Authentication service.</p>	

	<p style="text-align: center;"><u>UNIT - V</u></p> <p>IP Security: Overview, Architecture, Authentication, Encapsulating Security Payload, Combining security Associations, Key Management.</p> <p>Web Security: Web Security requirements, Secure sockets layer and Transport layer security, Secure Electronic Transaction. Intruders, Viruses and Related threats. Fire wall Design Principles, Trusted systems.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Cryptography and Network Security: Principles and Practice-William Stallings, Pearson Education. 2. Network Security Essentials (Applications and Standards) by William Stallings, Pearson Education. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Fundamentals of Network Security, by Eric maiwald 2. Principles of Information Security by Whitman, Thomson. 3. Network Security - The Complete Reference by Robert Bragg
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS3203 - FREE&OPEN-SOURCE SOFTWARE (FOSS)


Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Operating Systems and Basics of Unix	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	overview on open source basics
	CO2	Introduction to Linux OS
	CO3	Learning basic commands in UNIX and LINUX OS
	CO4	Exploring real time FOSS applications and development
	CO5	Application development in Linux
	CO6	Course beyond the syllabus
Course Content	<p align="center"><u>UNIT – I</u></p> <p>The Source of Open Source: What is Open source, who creates open source, who uses Open source, Where do I get open source software, when and how I use open source, Open Source History, Open Source Licenses.</p> <p align="center"><u>UNIT – II</u></p> <p>Introduction to Linux OS: OS basics, Linux GUI: Exploring folders, Installation of binary packages, Built in Package Mangers Introduction to Linux file system, man pages, The first command cat, Command History, Basic Unix Commands: vi editor, Redirection operators, some Unix commands.</p> <p align="center"><u>UNIT – III</u></p> <p>File Filters: Basic understanding about uniq, grep, cut, paste, join, tr, df, du, who, w, rm, unlink, ulimit, chmod, umask, chown, chgrp, id, diff, sed, cmp, comm, Introduction to pipes, Backup Commands: tar, cpio, zip and unzip commands, mount and umount</p> <p align="center"><u>UNIT – IV</u></p> <p>Real Time FOSS Applications: Ubuntu Operating System, LAMP, Mozilla Firefox, Virtual Box, Gimp, Moodle, Wordpress, Network Simulator, Open stack, Android, Libre Office, NewGenLib, Maxima, Media Wiki, qBittorrent, LaTeX.</p> <p align="center"><u>UNIT - V</u></p> <p>Open Source Software Development: Starting from what you have, Choose a license and apply it, Setting the tone, Technical infrastructure: What a project needs, Mailing lists, Version Control, Bug Tracker, RSS Feeds, Wikis,</p>	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Bernard Golden, "Succeeding with Open Source", Addison-Wesley Professional 2. N. B. Venkateshwarlu, "Introduction to Linux: Installation and Programming", B S Publishers, 2005. (An NRCFOSS Publication) 3. Karl Fogel, Producing Open Source Software http://producingoss.com, 2010 	

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13CS3204 - COMPILER DESIGN

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basics of Programming Languages and Theory of computation	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

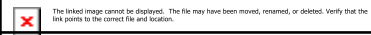

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Basics of compiler design and Lexical analyzer
	CO2	Briefing syntax analyzer, grammar rules, LR and CLR
	CO3	Overview on syntax translation and type checking mechanism
	CO4	Studying various Storage allocation strategies
	CO5	Exploring code optimization and code generation
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Introduction to Compiling: Compilers, Analysis of the Source program. Phases of a compiler, Cousins of the Compiler. Grouping of phases, Compiler construction tools. Lexical Analysis: Role of the analyzer. Input buffering, Specification of tokens, Recognition of tokens, A language for Specifying Lexical analyzer.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Syntax Analysis: Role of the parser, Context-free grammars, Writing a grammar, Top-down parsing, Bottom-up parsing, Operator-precedence parsing, LR parsers. Using ambiguous grammars, Parser generators.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Syntax Directed Translation: Syntax-directed definitions, Construction of syntax trees, Bottom-up evaluation of S-attributed definitions. L-attributed definitions. Top-down translations. Bottom-up evaluation of inherited attributes. Type Checking: Type systems, Specification of simple type checker. Equivalence of type expressions, Type conversions, Overloading of functions and operators, Polymorphic functions.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Run-Time Environments: Source Language issues, Storage organization, Storage- allocation strategies. Access to non-local names. Symbol tables, Language facilities for dynamic storage allocation. Dynamic storage allocation techniques.</p> <p>Intermediate Code generation: Intermediate languages. Declarations, Assignment statements.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Code Generation: Issues in the Design of a code generator, The target machine, Run-time storage management, Basic blocks and flow graphs, Next-use information. A simple code generator, Register allocation and assignment.</p> <p>Code Optimization: Introduction. The principle source of optimization.</p>	

Text Books and Reference Books:	TEXT BOOKS: <ol style="list-style-type: none">1. Alfred V. Aho, Ravi Sethi, and Jeffrey D. Ullman, Compilers- Principles, Techniques and Tools, Pearson Education,2004 REFERENCES: <ol style="list-style-type: none">1. Alfred V. Aho, Jeffrey D. Ullman, Principles of Compiler Design, Narosa publications.2. J.P.Benne, Introduction to Compiling Techniques, 2nd Edition, Tata McGraw-Hill.
E-Resources	 

13EC3201 - MICROPROCESSORS AND INTERFACING

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Fundamentals of Digital Logic Design and Computer Organization	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding the architecture and organization of 8085 MP
	CO2	Studying various addressing modes of 8085 MP
	CO3	Understand the architecture and organization of 8086 MP
	CO4	Overview on interrupt control and data transfer schemes
	CO5	Understanding of digital interfacing
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction to microprocessors, Evaluation of Microprocessors, Types of microprocessors, Architecture of 8085 microprocessor, pin configuration, Instruction Cycle, Timing Diagrams, Stack and Subroutines.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Instruction Set of 8085 microprocessor, Addressing modes, Assembly Language Programs (8085) for addition, subtraction, multiplication, division etc., Interrupts of 8085, Memory and I/O interfacing of 8085 microprocessor.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Architecture of 8086 microprocessor, Instruction set, Addressing modes, Interrupt system. Minimum mode and Maximum mode operations of 8086 and its timing diagrams, Assembler directives, Assembly language programs (8086), Stages of software development.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Data transfer schemes-synchronous, Asynchronous, Interrupt driven and DMA type schemes, Programmable interrupt controller (8259) and its interfacing, Programmable DMA controller (8257) and its interfacing, Programmable Interval Timer (8253) and its interfacing, Programmable communication Interface(8251 USART) and its interfacing.</p> <p style="text-align: center;"><u>UNIT - V</u></p> <p>Memory interfacing to 8086-Interfacing various types of RAM and ROM chips, PPI (8255) and its interfacing, ADC and DAC Interfacing, Waveform generation, Traffic light controller, Stepper motor control, temperature measurement and control.</p>	

Text Books and Reference Books:	TEXT BOOKS: <ol style="list-style-type: none">1. Ram. B, Fundamentals of Microprocessors and Micro controllers, Dhanpat Rai publications.2. A.K. Ray and K.M. Bhurchandi, Advanced Microprocessors and Peripherals, TMH.3. Douglas V. Hall, Microprocessors and interfacing: Programming and hardware, TMH, 2nd edition.
E-Resources	 

13 CS 32E1 - MOBILE COMPUTING (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Network Fundamentals and Programming in C++ or Java	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learn concepts of frequencies, multiplexing and modulation
	CO2	Exploring the concept of GSM architecture
	CO3	Briefing mobile IP, IP packet delivery and routing techniques
	CO4	Describing TCP and supporting types
	CO5	Exploring wireless application protocols, architectures, GSM
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Wireless Communication Fundamentals: Wireless transmission: Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing, Modulations, Spread spectrum. Medium Access Control: SDMA, FDMA, TDMA, CDMA.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Telecommunication Systems: GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, New data services. DECT: System architecture, Protocol architecture.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Mobile Network Layer: Mobile IP: Goals, assumptions and requirements, Entities and terminology, IP Packet delivery, Agent discovery, Registration, Tunneling and encapsulation, Optimizations. Dynamic Host Configuration Protocol, Mobile ad-hoc networks: Routing, DSDV, DSR, Alternative Metrics.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Mobile Transport Layer: Traditional TCP: Congestion control, Slow start, Fast retransmit/fast recovery. Classical TCP improvements: Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission/time-out freezing, Selective retransmission, Transaction-oriented TCP.</p> <p style="text-align: center;"><u>UNIT -V</u></p> <p>Mobile Application Layer: Wireless application protocol: Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Wireless markup language, WMLScript, Wireless telephony application, Push architecture, Push/pull services.</p>	

<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Jochen Schiller, Mobile Communications, PHI/Pearson Education, Second Edition, 2003 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. William Stallings, Wireless Communications and Networks, PHI/Pearson Education, 2002. 2. Kaveh Pahlavan, Prasanth Krishnamoorthy, Principles of Wireless Networks, PHI/Pearson Education, 2003. 3. Hazyszof Wesolowshi, Mobile Communication Systems, John Wiley and Sons Ltd, 2002.
<p>E-Resources</p>	<div data-bbox="437 517 810 551" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="437 551 1048 584" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS32E2 - NEURAL NETWORKS (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basic knowledge in Computer Networks and Knowledge in Artificial Intelligence	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learns about Learning Process
	CO2	Perfection in Optimization Techniques
	CO3	Gains knowledge in supervisory Learning
	CO4	Knowledge about support vector machines and committee machines
	CO5	Learns about Fuzzy systems
	CO6	Overall course outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Introduction: History of neural networks, Human Brain, models of a neuron, neural networks viewed as Directed graphs, Feedback, network architectures. Learning process: Error correction learning, memory-based learning, Hebbian learning, competitive learning, Boltzmann learning.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Single layer perceptron: Adaptive filtering problem, unconstrained optimization techniques, linear least squares filters, least mean square algorithm, learning curves, perceptron convergence theorem. Multi-layer perceptron: Multi-layer perceptron-back propagation algorithm, XOR Problem, output representation and decision rules, Network pruning techniques.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Radial Basis Function Networks: Introduction, cover's Theorem on the Separability of Patterns, Interpolation problem, supervised learning as an III – Posed Hyper surface Reconstruction problem, Regularization Networks, Generalized Radial Basis Function Networks, XOR Problem (revised), Approximation properties of RBF Networks.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Support vector machines: Introduction, optimal hyper plane for linearly separable patterns, optimal hyper plane for non-separable patterns, SVM for pattern recognition, SVM for non-linear regression. Committee machines: introduction, boosting, learning strategies for the HME model, EM algorithm, application of the EM algorithm to the HME model.</p>	

	<p style="text-align: center;"><u>UNIT – V</u></p> <p>Fuzzy sets, fuzzy systems, and applications: Fuzzy set, Membership functions, Geometry of fuzzy sets, simple operations on fuzzy sets, fuzzy rules for Approximation Reasoning, Defuzzification, fuzzy engineering, and applications.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Neural networks – A Comprehensive Foundation by Simon Haykin – Second Edition – Pearson Education. 2. Neural networks- A class room approach -Satish Kumar-TMH (Unit-V) <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. An Introduction to fuzzy Control, by D.Driankov, H.Hellen Doorn, M.Reinfrank, Naraosa Publishing House. 2. Essential of Fuzzy Modelling and Control, R.K. Yager, D.P.Filev, John Willey & Sons, Inc NY 1994
<p>E-Resources</p>	<div data-bbox="435 701 810 734" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="435 734 1048 768" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS32E3- GRID COMPUTING (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Knowledge in computing and Basic knowledge in computer Networks	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning about Grid architecture
	CO2	Gains knowledge in Grid Monitoring systems
	CO3	Gains knowledge in Grid Security
	CO4	Learns about Data management in Grid
	CO5	Practical knowledge with case studies
	CO6	Overall course outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>An Introduction to the Grid: Introduction, Characterization of the Grid, Grid-Related Standards Bodies, The Architecture of the Grid, OGSA and WSRF.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Grid Monitoring: Grid Monitoring Architecture (GMA), An Overview of Grid Monitoring Systems- Grid ICE – JAMM –MDS, Network Weather Service, R-GMA, Other Monitoring Systems- Ganglia and GridMon.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Grid Security And Resource Management: Grid Security-A Brief Security Primer, Grid Scheduling and Resource Management-Scheduling Paradigms- How Scheduling works -A Review of Condor, SGE, PBS and LSF-Grid Scheduling with QoS.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Data Management And Grid Portals: Data Management-Categories and Origins of Structured Data-Data Management Challenges-Architectural Approaches-Collective Data Management Services-Federation Services-Grid Portals-First-Generation, Second-Generation Grid Portals.</p> <p style="text-align: center;"><u>UNIT - V</u></p> <p>Grid Middleware: List of globally available Middle wares - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features.</p>	

<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Maozhen Li, Mark Baker, The Grid Core Technologies, John Wiley & Sons, 2005 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Ian Foster & Carl Kesselman, The Grid 2 – Blueprint for a New Computing Infrastructure, Morgan Kaufman – 2004. 2. Joshy Joseph & Craig Fellenstein, Grid Computing, Pearson Education 2004. 3. Fran Berman, Geoffrey Fox, Anthony J.G.Hey, Grid Computing: Making the Global Infrastructure a reality, John Wiley and sons, 2003
<p>E-Resources</p>	 

13CS32E4- DISTRIBUTED OPERATING SYSTEMS (ELECTIVE)

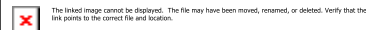

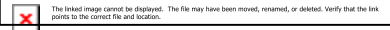
Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Computer Networks and Operating Systems	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Knowing the hardware and software concepts
	CO2	Learning about Synchronization
	CO3	Gains knowledge in distributed files systems
	CO4	Knowing about memory management and process management
	CO5	Learns about real time implemented distributed systems
	CO6	Overall course outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Distributed systems: Introduction, Hardware concepts, Software concepts and Design issues. Layered protocols, Asynchronous transfer mode networks, Client server model, Remote procedure call and Group communication.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Synchronization: Clock synchronization, Mutual exclusion, Election algorithms, Atomic transactions, Deadlocks in distributed systems. Processes and processors in Distributed Systems: Threads, System models, Processor allocation, Scheduling in distributed systems.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Processes and processors in Distributed Systems: Fault tolerance, Real-time distributed systems. Distributed file systems: Design, Implementation: File usage, System Structure, Caching, Replication. Distributed shared memory: Introduction, shared memory concept.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Distributed shared memory: Consistency models, Page-based distributed shared memory. Case Study Amoeba: Introduction, Objects and capabilities, Process management, Memory management, Communication and Servers.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Case Study MACH: Introduction, Process management, Memory management, Communication. Case Study DCE: Introduction, Threads, Remote procedure call, Time Service, Directory Service, Security Service, Distributed File System</p>	

Text Books and Reference Books:	TEXT BOOKS: 1. Tanenbaum A S, Distributed Operating Systems, Pearson Education, 2005 REFERENCES: 1. Sinha P K, Distributed Operating Systems: Concepts and Design, Prentice-Hall of India Pvt Ltd, 2005. 2. Coulouris G, Dollimore J, and Kindberg T, Distributed System Concepts and Design, 4th Edition, Pearson Education, 2005.
E-Resources	 

13CS32P1 - FREE & OPEN-SOURCE SOFTWARE LABORATORY



Course Category	Program Core	Credits:	2
Course Type:	Theory	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Operating Systems and Basics of Unix	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Installation of Ubuntu through virtual box, Implementing C and Java Programs on Linux
Course Content	<ol style="list-style-type: none"> 1. Install Virtual Box and discuss on its configuration settings. Install Ubuntu (Any Linux) OS in Virtual Box environment. 2. Study on Linux OS GUI, including Accessing the internet, Playing Music, shell, games, and settings. 3. Open source office package LibreOffice or OpenOffice basics 4. Installing and removing software's like VLC Player, Java, Games, and external binary packages. 5. Basic Unix Commands. 6. File Filter Commands. 7. C Programs execution in Linux Environment. 8. JAVA Programs execution in Linux OS. 9. Open source Media Wiki Practice. 10. Introduction about Moodle. 	
Text Books and Reference Books:	TEXT BOOKS: <ol style="list-style-type: none"> 1. Bernard Golden, "Succeeding with Open Source", Addison-Wesley Professional 2. N. B. Venkateshwarlu, "Introduction to Linux: Installation and Programming", B S Publishers, 2005. (An NRCFOSS Publication) 3. Karl Fogel, Producing Open Source Software http://producingoss.com, 2010. 	
E-Resources	  	

13EC 32P1 - MICROPROCESSORS LABORATORY

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Programming fundamentals	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Provides knowledge about various arithmetic and logical operations on CPU and different interfacing applications.
Course Content	<p>1. SUMMATION & BLOCK TRANSFER OF DATA</p> <p>a) Write and execute 8086 ALP to add the given series of BCD numbers and show the result.</p> <p>b) Write and execute 8086 ALP to transfer a Block of data from one memory location to another memory location</p> <p>2. MULTIPLICATION & DIVISION</p> <p>a) Write and execute 8086 ALP to perform the following multiplications.</p> <p>1) Using Repeated addition 2) Using SHIFT and ADD instruction</p> <p>b) Write and execute 8086 ALP to perform the following.</p> <p>1) Binary division 2) BCD division</p> <p>2. SEARCHING & SORTING DATA</p> <p>a) Write and execute 8086 ALP to find the minimum and maximum number from a given series of data</p> <p>b) Write and execute 8086 ALP to arrange the given series of data in ascending order and in descending order</p> <p>3. EVALUATION OF MATHEMATICAL EXPRESSION</p> <p>Mathematical Expressions</p> <p>a) $a*b - c/d + e$</p> <p>b) $\sum_{i=1}^n x_i y_i$</p> <p>4. CODE CONVERSION</p> <p>a) Write and execute 8086 ALP to convert HEXA-DECIMAL to BCD number</p> <p>b) Write and execute 8086 ALP to convert BCD to HEXA-DECIMAL number</p> <p>c) Write and execute 8086 ALP to convert HEXA-DECIMAL to ASCII number</p> <p>d) Write and execute 8086 ALP to convert ASCII to HEXA-DECIMAL number</p> <p>5. LOGIC CONTROLLER MODULE</p> <p>Write and execute 8086 ALP to design the logical expression(3 to Decoder) using Logic controller interface module</p> <p>6. STEPPER MOTOR MODULE</p>	

	<p>Write and execute 8086 ALP to rotate a stepper motor either in clockwise direction or in anticlockwise direction and to control the speed of rotation</p> <p>7. SERIAL INPUT DISPLAY UNIT MODULE(SIDU) Write and execute 8086 ALP to display the desired word in a 7-segment display of Serial Input Display Unit Interface module</p> <p>8. PARALLEL INPUT DISPLAY UNIT MODULE (PIDU) Write and execute 8086 ALP to design an Up-Counter and Down- Counter using Parallel Input Display Unit Interface module</p> <p>9. DIGITAL TO ANALOG CONVERTER INTERFACE MODULE Write an 8086 ALP to generate given waveform through CRO using DAC Interface module</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Ram. B, Fundamentals of Microprocessors and Micro controllers, Dhanpat Rai publications. 2. A.K. Ray and K.M. Bhurchandi, Advanced Microprocessors and Peripherals, TMH. 3. Douglas V. Hall, Microprocessors and interfacing: Programming and hardware, TMH, 2nd edition.
<p>E-Resources</p>	<div data-bbox="437 902 810 943" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="437 943 1048 981" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

Vision and Mission of the INSTITUTE

Vision:

To emerge as a comprehensive Institute that provides quality technical education and research thereby building up a precious human resource for the industry and society.

Mission:

- To provide a learner-centered environment that challenges individuals to actively participate in the education process.
- To empower the faculty to excel in teaching while engaging in research, creativity and public service.
- To develop effective learning skills enabling students to pick up critical thinking thus crafting them professionally fit and ethically strong.
- To reach out industries, schools and public agencies to partner and share human and academic resources.

Vision and Mission of the Department

Vision:

The department is committed to continually improve its educational environment in order to develop graduates with the strong academic and technical backgrounds needed to get distinction in the discipline globally and to achieve academic excellence by imparting in-depth knowledge to the students, facilitating research activities and cater to the ever changing industrial demands and societal needs.

Mission:

- M1:** To encourage students to become self-motivated, problem solving individuals who can find and understand of the knowledge needed to be successful in their profession.
- M2:** To provide intellectual inputs to knowledge-based industries in the form of qualified and trained manpower.
- M3:** To attain self-sustainability and overall development through Research and Consultancy.
- M4:** To produce best quality Computer Science Professionals by imparting quality training, hands on experience and value education.
- M5:** Providing an environment in which students are given the essential resources to address and solve real-world problems, participating in interdisciplinary and multidisciplinary research and its applications.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1:To produce graduates having strong fundamental knowledge in basic sciences and engineering, along with sound principles of computer programming with exposure to Computer Science and Engineering concepts that lead to problem solving techniques.

PEO2:To produce employable graduates who will be placed in various engineering positions in the computational world in firms of international repute.

PEO3:To produce graduates with strong communication skills and work effectively on team-based software development projects and will practice the ethics of their profession consistent with a sense of social responsibility.

PEO4:To pursuit of advanced degrees in engineering at different levels of research and consultancy. They get exposed to several other domains resulting in lifelong learning to broaden their professional knowledge.

PROGRAMME OUTCOMES (POs)

An Engineering Graduate will be able to:

- PO1:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- PO6:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**NBKR INSTITUTE OF SCIENCE & TECHNOLOGY:: VIDYANAGAR(AUTONOMOUS)
(AFFILIATED TO JNTU ANANTAPUR:NELLORE)**

SPSR NELLORE DIST

IV YEAR OF FOUR YEAR B.TECH DEGREE COURSE – I SEMISTER

**COMPUTER SCIENCE AND ENGINEERING
SCHEME OF INSTRUCTION AND EVALUATION**

(With effect from the academic year 2016-2017)
(For the batch admitted in the academic year 2013-2014)

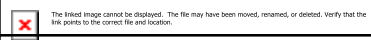
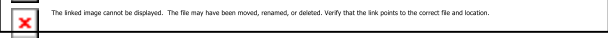
S.No	Course Code	Course Title	Instruction Hours/Week			Credits	Evaluation							
							Sessional Test-I		Sessional Test-II		Total Sessional Marks (Max. 40)	End Semester Examination		Maximum Total Marks
			THEORY				L	T	D/P	Duration In Hours		Max. Marks	Duration In Hours	
1	13SH4102	Management Science	4	-	-	4	2	40	2	40	0.8*Best of mid+0.2*other mid	3	60	100
2	13CS4101	Data Warehousing and Data Mining	4	-	-	4	2	40	2	40		3	60	100
3	13CS4102	Artificial Intelligence	4	-	-	4	2	40	2	40		3	60	100
4	13CS4103	C#and .net Framework	4	-	-	4	2	40	2	40		3	60	100
5	13CS4104	Web Technologies	4	-	-	4	2	40	2	40		3	60	100
6	13CS41E2	Elective-II	4	-	-	4	2	40	2	40		3	60	100
		PRACTICALS												
7	13CS41P1	C#and .net Laboratory			3	2	-	-	-	-	Day to Day Evaluation and a test (40 Marks)	3	60	100
8	13CS41P2	Networks and Compiler Design Laboratory			3	2	-	-	-	-		3	60	100
TOTAL			24	-	06	28	-	-	-	-		-	480	800

Course Code	Course Title	Instruction Hours/Week			Credits
		L	T	P	
	Elective - II				
13CS41E1	Software Architecture	4			4
13CS41E2	Service Oriented Architecture	4			4
13CS41E3	Wireless Networks	4			4
13CS41E4	Soft Computing	4			4

13SH4102 - MANAGEMENT SCIENCE

Course Category	Humanities and Social Sciences	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Good in English and Minimum awareness on Economics	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding the concept of Management and its objectives
	CO2	Exploring the corporate planning mission and objectives
	CO3	Overview on Human resource management
	CO4	Getting more functionality about personal management
	CO5	Understanding mass production, PERT and CPM
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Concept of Management – Administration, organization – Functions of Management, evolution of management thought – Organization, principles of organization – Types – Organization charts – Managerial objectives and social responsibilities.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Corporate planning – Mission, Objectives, and programs, SWOT analysis – Strategy formulation and implementation – plant location and plant layout concepts- Production control.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Human resources management- Manpower planning – Personnel management – Basic functions of personnel management, job evaluation and merit rating – Incentive plans – Marketing, Functions of marketing.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Productivity – Batch and mass production – Work study- Basic procedure involved in method study work measurement –Elements of cost- method of calculation of overhead charges – Depreciation.</p> <p style="text-align: center;"><u>UNIT - V</u></p> <p>Network Analysis to project management - PERT/CPM- Application of network techniques to engineering problems. – Cost Analysis- Project crashing.</p>	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Principles of management by Koontz and O.Donnel. 2. Industrial Engineering and Management by O.P.Khanna 	

	<p>REFERENCES:</p> <ol style="list-style-type: none">1. Marketing by Philip Kotler2. PERT/CPM by L.S. Srinath.3. Business policy by Gluek (TMH).
<p>E-Resources</p>	 <p>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</p>  <p>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</p>

13CS4101 - DATA WAREHOUSING AND DATA MINING

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Students need to have good awareness on Database Management Systems	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Basics of Data Warehousing and Development Life Cycle
	CO2	Understanding of Data warehouse design and modelling
	CO3	Introduction to Data Mining & Data Pre-processing
	CO4	Exploring Mining Frequent Patterns, Associations and Correlations
	CO5	Understanding of Classification and prediction, Cluster Analysis and Outlier Analysis.
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Introduction to Data Warehousing: Introduction: Data Warehouse, Data Warehousing, Framework of the Data Warehouse, Data Warehouse Options, Developing Data Warehouses, The Business Driven Approach, The DWRM Technique, Requirements Management Control, The Data Warehouse Development Life Cycle, Data Warehouse Development Methodologies.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Data Warehouse Design & Modeling: Defining Dimensional Model, Granularity of Facts, Additives of Facts, Functional Dependency of The Data, Slowly Changing Dimensions Types, Implementing Rapidly Changing Dimensions, Multi-use Dimensions, Designing: Identifying The Source, Data Warehouse Architecture (ETL process)</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Introduction to Data Mining: Data Mining, Architecture of Data Mining, Data Mining Functionalities, Interestingness of a Pattern, Classification of Data Mining Systems, Major Issues in Data Mining, Data Mining Task Primitives.</p> <p>Data Pre-processing: Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Concept Description: Characterization and Discrimination: Attribute-Oriented Induction for Data Characterization, Mining Class Discriminations, And Presentation Of Both Characterization And Discrimination.</p> <p>Mining Frequent Patterns, Associations and Correlations: Basic concepts and a Road Map, The Apriori Algorithm, Generating Association Rules, Improving The Efficiency of Apriori, Mining Frequent Item Sets Without Candidate Generation, From Association Analysis to Correlation Analysis.</p>	

	<p style="text-align: center;"><u>UNIT – V</u></p> <p>Classification and Prediction: Issues Regarding Classification and prediction, Decision Tree Induction, Bayes’ Theorem, Naive Bayesian Classification, Linear Regression, Nonlinear Regression, Other Regression-Based Methods.</p> <p>Cluster Analysis: Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods.</p> <p>Outlier Analysis: Distance-Based Outlier Detection, Density-Based Local Outlier Detection</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Data Mining Concepts and Techniques, Jiawei Han and Michelin Kamber, Morgan Kaufman Publications. 2. Data Warehousing Design, Development and Best Practices, Soumendra Mohanty, TMH. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Data Mining Introductory and Advanced Topics, Margaret H Dunhan, Pearson Education. 2. Data Mining, Ian H. Witten Eibe Frank, Morgan Kaufman Publications. 3. The Data Warehouse Life Cycle Toolkit, Ralph Kimball, WILEY Computer publishing.
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">  <small>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</small> </div> <div style="border: 1px solid black; padding: 5px;">  <small>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</small> </div>

13CS4102 - ARTIFICIAL INTELLIGENCE

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Students need to have basic mathematics skills and coding skills. Students need to have analytical skills and thinking skills.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

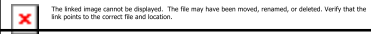
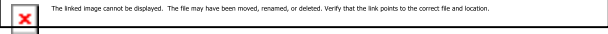
Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning basics of intelligent agents and decision making
	CO2	Learning various search strategies and applying to real world problems
	CO3	Understanding the structure of Constraint Satisfaction Problems
	CO4	Understanding of Knowledge -based Agents & Reasoning patterns
	CO5	Learning about kinds of learning
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction: A.I, History of A.I, The state of the Art, Intelligent Agents: Agents and Environments, Good behavior, The nature of Environments, The Structure of Agents.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Problem Solving: Problem Solving Agents, Toy Problems, Real-World Problems, Searching For Solutions.</p> <p>Uninformed Search strategies: BFS, DFS, Depth-limited search. Informed Search strategies: GBFS, A* Search.</p> <p>Local Search Algorithms: Hill-climbing.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Constraint Satisfaction Problems: Constraint Satisfaction Problems, Backtracking Search for CSPs, Local Search for CSPs, The Structure of The Problem.</p> <p>Adversarial Search: Games, Optimal Decision in Games, Alpha-Beta Pruning, Imperfect, Real-Time Decisions, Games That Include an Element of Chance, State-of- the-Art Game Programs.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Knowledge and Reasoning: Logical Agents: Knowledge -based Agents, The WUMPUS World, Logic, Propositional Logic, and Reasoning Patterns in Propositional Logic, Resolution, Forward and Backward Chaining. First-order Logic: Syntax and Semantics of First-Order Logic, Using FOL- Assertions and Queries in FOL.</p> <p style="text-align: center;"><u>UNIT - V</u></p> <p>Learning: Learning from Observations- Forms of Learning, Inductive Learning, Learning Decision Trees, Ensemble Learning</p> <p>Knowledge in Learning: A Logical Formulation of Learning, Knowledge In Learning, Explanation-Based Learning, Learning using Relevance Information.</p>	

<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Artificial Intelligence- A Modern Approach, Stuart Russell, Peter Norvig (Pearson Education), 2nd edition. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Artificial Intelligence- Rich E & Knight K (TMH), 4th edition. 2. Artificial Intelligence Structures and Strategies complex problem Solving – George F. Luger Pearson Education.
<p>E-Resources</p>	<div data-bbox="416 412 794 443" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="416 443 1031 483" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS4103 - C # AND .NET FRAMEWORK

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Before learning the subject students need to have very basic knowledge of any one programming language like 'c'.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning the basics of C#
	CO2	Understanding of Object oriented Aspects of C#
	CO3	Able to build applications on Windows environment using .net
	CO4	Able to develop Web Based Applications
	CO5	Able to build server and client using .Net Framework
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Basics Of C#: Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures and Enumerations.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Object Oriented Aspects Of C#: Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator overloading, Delegates, Events, Errors and Exceptions.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Application Development On .NET: Building Windows Applications, Accessing Data With ADO.NET.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Web Based Application Development On .NET: Programming Web Applications With Web Forms, Programming Web Services.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>The CLR And The .NET Framework: Assemblies, Versioning, Attributes, Reflection, Viewing metadata – Type discovery, Reflecting on a Type, Marshalling, Remoting, Understanding Server Object Types, Specifying a Server With an Interface, Building a Server, Building the client – Using Single Call, Threads.</p>	
Text Books and Reference Books:	<p>TEXTBOOKS:</p> <ol style="list-style-type: none"> 1. E. Balagurusamy, Programming in C#, TMH, 2004. 2. J. Liberty, Programming C#, 2nd Edition, O'Reilly, 2002 	

	<p>REFERENCES:</p> <ol style="list-style-type: none">1. Herbert Schildt, The Complete Reference -C#, TMH, 2004.2. Robinson et al, Professional C#, 2nd Edition, Wrox Press, 2002.3. Andrew Troelsen, C# and the .NET Platform, A1 Press, 2003.4. S. Thamarai Selvi and R. Murugesan, A Textbook on C#, Pearson Education, 2003.
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13CS4104 -WEB TECHNOLOGIES

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Student needs to have knowledge in Java programming. Student need to have awareness on client- server architecture	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning about HTML and Java Script
	CO2	Understanding the concepts of DHTML, XML & Web Servers
	CO3	Understanding on java based web technologies
	CO4	Understanding more on JSP
	CO5	Exploring on Client server computing
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT – I</u></p> <p>Introduction To Web Technology: Web Pages-Types And Issues, Tiers, The Concept Of A Tier, Web Pages, Static Web Pages. HTML: Introduction to HTML, Common Tags, Need For Dynamic Web Pages. Java Script: Introduction to Scripting, Control Structures-I, Control Structures-II, Functions, Arrays, Objects.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>DHTML: Cascading Style Sheets, Document Object Model And Collections, Event Model. XML: Basics of XML, DTD, XML Schema, XML Vocabularies. Web Servers: IIS, Apache, & WAMP Servers.</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Java based Web Technologies: Introduction to Java Servlets, Servlet Life Cycle, Http Servlet Class, Http Servlet Request & Response Interfaces, Session Tracking, Cookies, Using JDBC from a Servlet Java Server Pages (JSP): Introduction to JSP, Elements in JSP.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Client Server Computing: Introduction to Client/Server, Client Server Models Client/Server Architectures: 2-Tier, 3-Tier and N-tier, Basic Building Blocks of Client Server, Building Blocks Arrangements, Server Scalability.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>PHP: Overview of PHP, PHP Basics, String Processing & Regular Expressions, Connecting to a Database, Cookies using PHP.</p>	

<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Dietel and Nieto, Internet & World wide Web How to Program 4ed: PHI/Pearson Education Asia. 2. Client/Server Survival Guide, 3rd Edition by Dan Harkey. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. H. Schild, The Complete Reference JAVA2, 5 ed.: Tata McGraw Hill. 2. B. Boiko, Content Management Bible. 3. S. M. Grath, XML by Example, 5 ed.: Prentice Hall of India/Pearson Education. . 4. C. Bates, Web Programming building Internet Applications, 2 ed.: WILLEY Dream Tech.
<p>E-Resources</p>	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm

13CS 41E1 - SOFTWARE ARCHITECTURE (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Student need to have analysis skills and thinking abilities and requires SE basics.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Focus on IT architectures
	CO2	More understanding on interoperability
	CO3	Understanding Design Patterns
	CO4	Have experience on implemented broker architectures like CORBA
	CO5	Able to create and evaluate a product
	CO6	Overall course Outcome
Course Content	<p align="center"><u>UNIT - I</u></p> <p>Introduction to Software Architecture: An Engineering Discipline for Software, Status of S/W Architecture. Architecture Business Cycle: Introduction, Where do Architectures Come from, Software Processes and the Architecture Business Cycle, Features of Good Architecture.</p> <p align="center"><u>UNIT - II</u></p> <p>Architecture Styles: Overview Pipes and Filters, Data Abstraction and Object Oriented organization, Event-based Implicit Invocation, Layered Systems, Registers, Interpreters, Process Control, Other Familiar Architectures, and Heterogeneous Architectures. Shared Information Systems: Introduction, Database Integration, Interpretation in Software Development Environments, Architectural Structures for Shared Information Systems.</p> <p align="center"><u>UNIT - III</u></p> <p>Architectural Design Guidance: Guidance for User Interface Architectures. Case Study in Inter-Operability: World Wide Web. Design Patterns: Introduction, Pattern Types, Architectural Patterns, Structural Patterns, Patterns for Distribution, Patterns for Interactive Systems.</p> <p align="center"><u>UNIT - IV</u></p> <p>Formal Models And Specifications: The Value of Architectural Formalism, Formalizing the Architectural of a Specific System, Formalizing an Architectural Style and Architectural Design Space. Case Study of an Industry Standard Computing Infrastructure: CORBA Architectural Description Languages: ADL's today, Capturing Architectural Information in an ADL, Application of ADL's in System Development, Choosing an ADL, Example of ADL.</p>	

	<u>UNIT – V</u>
	<p>Reusing Architectural Assets within an Organization: Creating Products and Evaluating a Product Line, Organizational Implications of a Product Line, Component Based Systems.</p> <p>Software Architectures in Future: Legacy Systems, Achieving Architecture, From Architecture to System.</p>
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. S/W Arch. Perspective: on an Emerging Discipline by Mary Shaw, David Garlan, 1996, PHI. 2. Software Architecture in Practice by Len Bass, Paul Elements, Rick Kazman, 1998, PEA 3. Design Patterns, Gamma et al, 1995, PEA. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Measuring the Software Process: A Practical Guide to Functional Measure, Garmus, Herros, 1996, PHI. 2. Meas. Software Process: Stat. Proce. Cont. for Software process Improvements, Florac, Carleton, 1999, PEA. 3. Introduction to Team Software Process, W.Humphery, 2002, PEA. 4. Software Design: Methods and Techniques, Peters, 1981, Yourdon. 5. Pattern Oriented Software Architecture, Buschmann, 1996, Wiley. 6. An Introduction to Software Architecture, Gamma, Shaw, 1995, World Scientific. 7. Software Architecture, Shaw, gamma, 1996, PHI.
E-Resources	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm

13CS41E2 - SERVICE ORIENTED ARCHITECTURE (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Student need to have analysis skills and thinking abilities and requires SE basics	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Focus on IT architecture and Applications
	CO2	Understanding Software platforms for various Applications
	CO3	Briefing service oriented analysis and design
	CO4	Exploring SOA Implementation and its governance
	CO5	Understanding meta data management
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Software Architecture: Types of IT Architecture , SOA – Evolution – Key Components , Perspective of SOA, Enterprise-wide SOA – Architecture, Enterprise Applications, Solution Architecture for Enterprise Application ,Software Platforms for Enterprise Applications , Patterns for SOA , SOA Programming Models.</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Service-oriented Analysis and Design: Design of Activity, Data, Client and Business Process Services, Technologies of SOA ,SOAP ,WSDL ,JAX ,WS ,XML, WS for .NET, Service integration with ESB, Scenario , Business Case for SOA , Stakeholder Objectives, Benefits of SOA ,Cost Savings .</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>SOA implementation and Governance: Strategy, SOA development, SOA Governance, Trends in SOA, Event-Driven Architecture, Software As Service, SOA Technologies, Proof-of-concept, Process Orchestration, SOA Best Practices.</p> <p style="text-align: center;"><u>UNIT – IV</u></p> <p>Meta Data Management: XML security, XML signature, XML Encryption, SAML, XACML, XKMS, WS-Security and Security in Web Service Framework, Advanced Messaging.</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Transaction Processing: Paradigm, Protocols And Coordination, Transaction Specifications, SOA In Mobile.</p>	

Text Books and Reference Books:	TEXT BOOKS: <ol style="list-style-type: none">1. Understanding SOA with Web Services by Eric Newcomer, Greg Lomow, Pearson Education.2. Web Services Security by Mark O' Neill, et al., Tata McGraw-Hill Edition, 2003.3. Service –Oriented Architecture for Enterprise Applications by Shankar Kambhampaly, Wiley
E-Resources	<ol style="list-style-type: none">1. https://nptel.ac.in/courses2. https://freevideolectures.com/university/iitm

13CS41E3 - WIRELESS NETWORKS (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Need to have knowledge in fundamentals of computer networks	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Gain knowledge on example wireless networks
	CO2	Learn more about multiple access in wireless networks
	CO3	Gain knowledge about satellite systems
	CO4	More understanding on wireless LAN Networks
	CO5	More understanding about Adhoc Networks
	CO6	Overall course outcome
Course Content	<u>UNIT – I</u>	
	<p>Introduction to Wireless Networks: Evolution of Wireless Networks : Early Mobile Telephony, Analog Cellular Telephony , Digital Cellular Telephony, Cordless Phones, Wireless Data Systems, Fixed Wireless Links, Satellite Communication Systems, Challenges.</p>	
	<u>UNIT – II</u>	
	<p>Wireless Communications Principles and Fundamentals: The Electromagnetic Spectrum: Transmission Bands and Their Characteristics, Spectrum Regulation, Wireless Propagation Characteristics and Modeling, Analog and Digital Data Transmission, Modulation Techniques for Wireless Systems, Multiple Access for Wireless Systems.</p>	
	<u>UNIT – III</u>	
<p>Satellite Networks: Satellite Communications Characteristics, Spectrum Issues, Applications of Satellite Communications, Satellite Systems, VSAT Systems, Examples of Satellite-based Mobile Telephony Systems and Satellite-based Internet Access.</p> <p>Fixed Wireless Access Systems: Wireless Local Loop versus Wired Access, Wireless Local Loop, Wireless Local Loop Subscriber Terminals (WLL), Wireless Local Loop Interfaces to the PSTN.</p>		
<u>UNIT – IV</u>		
<p>Wireless Local Area Networks: Benefits of Wireless LANs, Wireless LAN Applications, Wireless LAN Topologies, Wireless LAN Requirements.</p> <p>The Physical Layer: The Infrared Physical Layer, The Medium Access Control (MAC) Layer: The HIPERLAN 1 MAC Sublayer, The IEEE 802.11 MAC Sublayer.</p>		
<u>UNIT – V</u>		
<p>Wireless ATM and Adhoc Routing: ATM, Wireless ATM, Wireless ATM Architecture, HIPERLAN 2 - An ATM Compatible WLAN, Routing in Wireless</p>		

	<p>Security Issues in Wireless Systems: The Need for Wireless Network Security, Attacks on Wireless Networks, Security Services, Wired Equivalent Privacy (WEP) Protocol, Mobile IP, Weaknesses in the WEP Scheme Virtual Private Network (VPN).</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. P. Nicopolitidis, M.S.Obaidat, G.I.Papadimitriou, A.S.Pomportsis: Wireless Networks, John Wiley & Sons Ltd 2003. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. 802.11 Wireless Networks: The Definitive Guide, 2nd Edition by Matthew S. Gast
<p>E-Resources</p>	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm

13CS41E4 - SOFT COMPUTING (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Need to have Algorithmic analysis and requires more knowledge in Artificial Intelligence	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding of Genetic Algorithms
	CO2	Good knowledge on Neural Networks
	CO3	More about various learning techniques
	CO4	Understand Fuzzy Logic
	CO5	Able to develop applications using Fuzzy modelling
	CO6	Overall course outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Fundamentals of Neural Networks: Basic concepts of Neural Networks, Model of an Artificial Neuron, Neural Network Architectures, Characteristics of Neural Networks, Learning Methods, Taxonomy of Neural Network architectures, Early Neural Network Architectures, Applications</p> <p>Back-Propagation Networks: Architecture of a Back propagation Network, Back propagation learning, Applications, Effect of Tuning parameters of the back propagation neural network, selection of various parameters in BPN, Variations of standard Back propagation Algorithm, Research Directions .</p> <p style="text-align: center;"><u>UNIT – II</u></p> <p>Associative Memory – Autocorrelators, Heterocorrelators: Kosko’s Discrete BAM, Wang et al.’s Multiple Training Encoding Strategy, Exponential BAM, Associative Memory for Real-coded Pattern Pairs, Applications, Recent Trends.</p> <p>Adaptive Resonance Theory: Introduction, ART1, ART2, Applications, Sensitivities of Ordering of Data Fuzzy logic – Fuzzy versus Crisp, Crisp sets, Fuzzy sets, Crisp relations, Fuzzy relations, Crisp Logic, Predicate Logic, Fuzzy Logic, Fuzzy Rule based system, Defuzzification Methods, Applications</p> <p style="text-align: center;"><u>UNIT – III</u></p> <p>Fundamentals of Genetic Algorithms – Genetic Algorithms: History, Basic concepts, Creation of offsprings, Working Principle, Encoding, Fitness Function, Reproduction.</p> <p>Genetic Modeling: Inheritance Operators, Cross Over, Inversion and Deletion, Mutation Operator, Bit-wise Operators, Bit-wise Operators used in GA, Generational Cycle, Convergence of Genetic Algorithm, Applications, Multi-level Optimization, Real Life Problem, Differences and similarities between GA and other traditional methods, Advances in GA.</p>	

	<p style="text-align: center;"><u>UNIT – IV</u></p> <p>Integration of Neural Networks: Fuzzy Logic and Genetic Algorithms – Hybrid Systems, Neural Networks, Fuzzy Logic and Genetic Algorithms Hybrids, Preview of the Hybrid Systems to be discussed Genetic Algorithm Based Back-Propagation Networks - GA based Weight Determination, Applications Fuzzy Back Propagation Networks – LR-type Fuzzy numbers, Fuzzy Neuron, Fuzzy BP Architecture, Learning by Fuzzy BP, Inference by Fuzzy BP, Applications</p> <p style="text-align: center;"><u>UNIT – V</u></p> <p>Simplified Fuzzy ARTMAP – Fuzzy ARTMAP: A Brief Introduction, Simplified Fuzzy ARTMAP, Working of Simplified Fuzzy ARTMAP, Application: Image Recognition, Recent Trends</p> <p>Fuzzy Associative Memories – FAM: Introduction, Single Association FAM, Fuzzy Hebb FAMs, FAM Involving a Rule Base, FAM Rules with Multiple Antecedents/Consequents, Applications</p> <p>Fuzzy Logic Controlled Genetic Algorithms: Soft Computing Tools, Problem Description of Optimum Design, Fuzzy Constraints, Illustrations, GA in Fuzzy Logic Controller Design, Fuzzy Logic Controller, FLC-GA Based Structural Optimization, Applications.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Rajasekaran S, and Vijayalakshmi Pal G A, Neural Networks, Fuzzy Logic Algorithms - Synthesis and Application, Prentice-Hall of India Pvt Ltd, 2000 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Walker E A, A First Course in Fuzzy Logic, 2nd Edition, CRC Press, 1999 2. Lu, Fuzzy Logic with Engineering Application, John Wiley, 2004. 3. Haupt, Genetic Algorithms, John Wiley, 1999. 4. Yegnanarayana B, Artificial Neural Networks, Prentice-Hall of India Pvt L
<p>E-Resources</p>	<ol style="list-style-type: none"> 1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm

13CS41P1 - C# AND .NET LABORATORY

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Need to have very basic knowledge in programming language like 'C'. Hands on practice on Networking	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding C# and .Net functionality implementation
Course Content		<ol style="list-style-type: none"> 1. Write a simple program in C# to write a string on the screen. 2. Write a program in C# to prompt the user for some input and then take some action. 3. Write a program to demonstrate how unary operators are used. 4. Write a program in C# to demonstrate how binary operators work. 5. Write a program in C# to demonstrate different kinds of arrays including jagged arrays. 6. Write a program in C# to override a method which calculates pay of an employee taking bonus into account. 7. Write a program in C# to ask a user to enter a choice to add, delete, modify or view address using methods, for each function. 8. Write a program in C# to demonstrate and verify that the static constructor runs only one time, even though two instances of Class are created, and that it runs before the instance constructor runs. 9. Write a program in C# to show that when a struct is passed to a method, a copy of the struct is passed, but when a class instance is passed, a reference is passed. 10. Write a Program to implement an Interface. 11. Write a program to invoke an event when a list of documents is changed. 12. Write a program in C# to create a base class shape and derived classes i.e., Rectangle, Circle, and Triangle. Invoke the method from base class shape using polymorphism. 13. Create an Active-X control for file operations. 14. Develop a component for converting the currency values using COM/.NET. 15. Develop a component for encryption and decryption using COM/.NET. 16. Develop a component for retrieving information from message box using DCOM/.NET
Text Books and Reference Books:		<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. E. Balagurusamy, Programming in C#, TMH, 2004. 2. J. Liberty, Programming C#, 2nd Edition, O'Reilly, 2002. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Herbert Schildt, The Complete Reference –C#, TMH, 2004. 2. Robinson et al, Professional C#, 2nd Edition, Wrox Press, 2002. 3. Andrew Troelsen, C# and the .NET Platform, A1 Press, 2003. 4. S. Thamarai Selvi and R. Murugesan, A Textbook on C#, Pearson Education, 2003.

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13CS41P2 - NETWORKS AND COMPILER DESIGN LABORATORY

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Need to have Theoretical knowledge in computer networks and in compiler design.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding Network Algorithms and compiler design issues implementations.
Course Content		<ol style="list-style-type: none"> 1. Implement the following Framing Techniques <ol style="list-style-type: none"> i) Bit Stuffing ii) Character Stuffing 2. Write a program for error detecting code using CRCCITT (16-bits). 3. Write a program for distance vector algorithm to find suitable path for transmission. 4. Write a program for client-server application for chat using TCP. 5. Write a program for client-server application for chat using UDP. 6. Write a program for Hamming Code generation for error detection and correction. 7. Write a program for simple RSA algorithm to encrypt and decrypt the data. 8. Write a program to identify the tokens of a given input file. 9. Write a program to compute FIRST of non-terminal. 10. Write a program to compute FOLLOW of non-terminal. 11. Write a Program to check whether a grammar is left Recursive and remove left recursion. 12. Write a Program to remove left factoring. 13. Write a program to identify the tokens of a given input file. 14. Write a program to the following address codes <ol style="list-style-type: none"> i. Zero address code ii. One address code iii. Two address code
Text Books and Reference Books:		<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. S. Tanenbaum (2003), Computer Networks, 4th edition, Pearson Education/ PHI, New Delhi, India. 2. Alfred V. Aho, Ravi Sethi, and Jeffrey D. Ullman, Compilers-Principles, Techniques and Tools, Pearson Education, 2004 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Behrouz A. Forouzan (2006), Data communication and Networking, 4th Edition, Mc.Graw-Hill. 2. Alfred V. Aho, Jeffrey D. Ullman, Principles of Compiler Design, Narosa publications. 3. J.P. Benne, Introduction to Compiling Techniques, 2nd Edition, Tata McGraw-Hill

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**NBKR INSTITUTE OF SCIENCE & TECHNOLOGY:: VIDYANAGAR (AUTONOMOUS)
(AFFILIATED TO JNTU ANANTAPUR:NELLORE)**

SPSR NELLORE DIST

IV YEAR OF FOUR YEAR B.TECH DEGREE COURSE – II SEMESTER

COMPUTER SCIENCE AND ENGINEERING

SCHEME OF INSTRUCTION AND EVALUATION

(With effect from the academic year 2016-2017)

(For the batch admitted in the academic year 2013-2014)

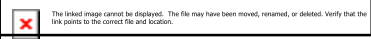

S.No	Course Code	Course Title	Instruction Hours/Week			Credits	Evaluation										
			L	T	D/P		Sessional Test-I		Sessional Test-II		Total Sessional Marks (Max. 40)	End Semester Examination		Maximum Total Marks			
							Duration In Hours	Max. Marks	Duration In Hours	Max. Marks		Duration In Hours	Max. Mark				
		THEORY															
1	13CS4201	Cloud Computing	4	-	-	4	2	40	2	40	0.8*Best of two+0.2*least of two	3	60	100			
2	13CS4202	Storage Area Networks	4	-	-	4	2	40	2	40		3	60	100			
3	13CS42E3	Elective-III	4	-	-	4	2	40	2	40		3	60	100			
		PRACTICALS															
4	13CS42P1	Web Technologies Laboratory			3	2	-	-	-	-	Day to Day Evaluation and a test (40 Marks)	3	60	100			
5	13CS42P2	Project Work			3	6	-	-	-	-	Continuous Assessment and Seminar (80 Marks)	3	120	200			
TOTAL			12	-	06	20	-	-	-	-		-	360	600			

Course Code	Course Title	Instruction Hours/Week			Credits
		L	T	P	
	Elective - III				
13CS42E1	Advanced Database Management Systems	4			4
13CS42E2	Embedded Systems	4			4
13CS42E3	Multimedia & Application Development	4			4
13CS42E4	Advanced Computer Architecture	4			4

13CS 4201 - CLOUD COMPUTING

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Students need to have knowledge on computing basics, Data management techniques	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Defining cloud computing and history
	CO2	Describing the need of cloud Computing and its benefits
	CO3	Developing cloud services by using different service tools
	CO4	Exploring on different cloud services like calendar etc.
	CO5	Exploring on word processing tools, Blogs and Wikis
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>Introduction To Cloud Computing: Define Cloud Computing, A short history of cloud computing, How cloud computing works, Companies in the cloud today, Why cloud computing matters, Pros and cons of cloud computing, benefits of cloud computing, Who shouldn't be using cloud computing.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Developing Cloud Services: Why develop web based applications, the pros and cons of cloud service development, Types of cloud service development, Discovering cloud services development services and tools.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Cloud Computing For Everyone: Cloud computing for the family, Cloud computing for the community, cloud computing for the corporation.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Cloud Services: Collaborating on calendars, Schedules, and Task Management, Exploring online scheduling applications, Exploring online planning and task management, Collaborating on Word Processing, Storing and sharing files and Other Online Content, Exploring Online Photo-Editing Applications.</p> <p style="text-align: center;"><u>UNIT - V</u></p> <p>Other Ways To Collaborate Online: Collaborating via Web-Based Communication Tools, Collaborating via Social Networks and Groupware, Collaborating via Blogs and Wikis.</p>	
Text Books and Reference Books:	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, August 2008 	

	<p>REFERENCES:</p> <ol style="list-style-type: none">1. Cloud Application Architectures by George Reese2. Cloud computing: Concepts, Technology and Architecture by Thomas E.
<p>E-Resources</p>	 <p>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</p>  <p>The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location.</p>

13CS4202 - STORAGE AREA NETWORKS

Course Category	Program Core	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Need to have knowledge in computer networks, network storage, and network organizations	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Exploring on storage area networking and architectures
	CO2	Giving more details about radical change in information and storage and processing.
	CO3	Exploring on SANs about the need in real life
	CO4	Understanding and view on Data Center evolution
	CO5	Exploring on Killer Apps for SANs
	CO6	Overall Course Outcome
Course Content	<p style="text-align: center;"><u>UNIT - I</u></p> <p>What Storage Networking Is and What It Can Mean to You: What is SAN, Why Connect Storage to a Network, The Secret to SANs' Success: Software, The Best Is Yet to Come: Radical Changes in Information, Storage and Processing, Back to Earth, A Couple of Closing Clarifications.</p> <p>What to Expect from SANs: The SAN Paradigm Shift, A Model for Enterprise Information Processing, Ten Ways the SAN Paradigm Shift Changes Information Processing for the Better.</p> <p style="text-align: center;"><u>UNIT - II</u></p> <p>Leading Up to SANs: One View of Data Center Evolution;</p> <p>Killer Apps for SANs: Backup—The Application Everyone Loves to Hate, Highly Available Data, Disaster Recoverability, Clusters—Continuous Computing, Data Replication, The Bottom Line: Continuous Global Access to Timely Information.</p> <p style="text-align: center;"><u>UNIT - III</u></p> <p>Storage Networking Architecture: The Path from Data to Application, Network Storage Systems.</p> <p>The Storage in Storage Networking: Challenges for Network Storage, The Cost of Online Storage, Making SAN Storage Perform, Keeping SAN Storage Up and Working, Choosing among Storage Options.</p> <p style="text-align: center;"><u>UNIT - IV</u></p> <p>Basic Software for Storage Networking: Software for SANs, Shared Access Data Managers, Computer System I/O Performance, Volumes: Resilience, Performance, and Flexibility, File Systems and Application Performance.</p> <p>Advanced Software for Storage Networking: Data Replication, Types of Data Replication, Different Types of Data Replication, Synchronous and Asynchronous Replication, Using Data Replication.</p>	

	<p style="text-align: center;"><u>UNIT – V</u></p> <p>Clusters: The Processing in Data Processing, Cluster Data Models, Disaster Recovery and Global Clusters, Clusters and Storage Area Networks.</p> <p>Enterprise Backup Software for Storage Area Networks: Backup Management for SANs, Enterprise Data Protection, Enterprise Backup Architecture, Enterprise Backup Policies, Minimizing the Impact of Backup</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Storage Area Network Essentials - A Complete Guide to Understanding and Implementing SANs by Richard Barker and Paul Massiglia, Wiley, 2002 <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Introduction to Storage Area Networks and System Networking by Jon Tate et.al., IBM Red Books. 2. SAN - The Network for Storage, a paper by Ashish Chaturvedi, Tata Consultancy Services. 3. Using SANs and NAS by W.Curtis Preston, Mike Loukides.
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS42E1 - ADVANCED DATA BASE MANAGEMENT SYSTEMS
(ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Students need to have basic knowledge on Database systems	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learning about different types of databases
	CO2	Knowing about Parallel systems and distributed systems
	CO3	More knowledge on Distributed databases
	CO4	More knowledge on Object-based databases
	CO5	Able to understand practical database systems with case studies
	CO6	Overall course Outcome
Course Content	<p align="center"><u>UNIT – I</u></p> <p>Database-System Architectures: Centralized and Client–Server Architectures, Server System Architectures, Parallel Systems, Distributed Systems, Network Types. Query Processing: Overview, Measures of Query Cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions.</p> <p align="center"><u>UNIT – II</u></p> <p>Parallel Databases: Introduction, I/O Parallelism, Inter-query Parallelism, Intraquery Parallelism, Interoperation Parallelism, Interoperation Parallelism, Query Optimization, Design of Parallel Systems, Parallelism on Multicore.</p> <p align="center"><u>UNIT – III</u></p> <p>Distributed Databases: Homogeneous and Heterogeneous Databases, Distributed Data Storage, Distributed Transactions, Commit Protocols, Concurrency Control in Distributed Databases, Availability, Distributed Query Processing, Heterogeneous Distributed Databases, Cloud-Based Databases, Directory Systems.</p> <p align="center"><u>UNIT – IV</u></p> <p>Object-Based Databases: Overview, Complex Data Types, Structured Types and Inheritance in SQL, Table Inheritance, Array and Multiset Types in SQL, Object- Identity and Reference Types in SQL, Implementing O-R Features, Persistent Programming Languages, Object-Relational Mapping, Object-Oriented versus Object- Relational</p> <p align="center"><u>UNIT - V</u></p> <p>CASE STUDY</p> <p>Oracle: Database Design and Querying, Tools, SQL Variations and Extensions, Storage and Indexing, Query Processing and Optimization,</p>	

<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Abraham Silberchatz, Henry F. Korth, S.Sudarsan, Database System Concepts, Fifth Edition, McGraw-Hill, 2006. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Ramez Elmasri & Shamkant B. Navethe, Fundamentals of Database Systems, fourth Edition, Pearson Education, 2004. 2. Stefano Ceri, Giuseppe Pelagatti, Distributed Databases Principles and Systems, McGraw-Hill International Editions, 1985. 3. Thomas M. Connolly, Carolyn E. Begg, Database Systems – A Practical Approach to Design, Implementation and Management, Third edition, Pearson Education, 2003.
<p>E-Resources</p>	<div data-bbox="443 548 821 582" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div data-bbox="443 582 1061 616" style="border: 1px solid black; padding: 2px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS42E2 - EMBEDDED SYSTEMS (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Basic knowledge in Microprocessors and Memory organization and assembly language programming.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Learn about Example embedded systems
	CO2	Learn more on Microprocessor architecture.
	CO3	Developing small applications like A/D conversion and D/A conversion
	CO4	Knowing basics of Real time operating systems
	CO5	Knowing debugging techniques in Real time operating systems
	CO6	Overall course outcome
Course Content	<p align="center"><u>UNIT - I</u></p> <p>Embedded Computing: Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples.</p> <p align="center"><u>UNIT - II</u></p> <p>The 8051 Architecture: Introduction, 8051 Micro controller Hardware, Input/output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/output, Interrupts.</p> <p>Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions.</p> <p align="center"><u>UNIT - III</u></p> <p>Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.</p> <p>Applications: Interfacing with Keyboards, Displays, D/A & A/D Conversions, Multiple Interrupts, Serial Data Communication.</p> <p align="center"><u>UNIT - IV</u></p> <p>Introduction to Real-Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment.</p> <p align="center"><u>UNIT - V</u></p> <p>Basic Design Using a Real-Time Operating System: Principles, Semaphores and Queues, Hard Real -Time Scheduling Considerations, Saving Memory and Power, An example RTOS like μC OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for</p>	

	<p>Getting Embedded Software into the Target System ; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System.</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Computers as Components-principles of embedded computer system design, Wayne Wolf, Elsevier. 2. The 8051 Microcontroller, Third Edition, Kenneth J. Ayala, Thomson. 3. An Embedded Software Primer, David E. Simon, Pearson Education. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Embedding system building blocks, Labrosse, via CMP publishers. 2. Embedded Systems, Raj Kamal, TMH. 3. Micro Controllers, Ajay V Deshmukhi, TMH. 4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley. 5. Microcontrollers, Raj kamal, Pearson Education
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS42E3 - MULTIMEDIA & APPLICATION DEVELOPMENT
(ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Need to have knowledge on computer graphics. Have overview on WWW.	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100



Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Understanding fundamental concepts of Text and Images
	CO2	Exploring the concepts of video and Digital video
	CO3	Exploring more on Action scripts like data types and type checking, inheritance etc.
	CO4	Developing some applications & Basic Video compression Techniques using classes
	CO5	Learning basics of multimedia networks and compare with an ATM Networks
	CO6	Overall Course Outcome
Course Content	<u>UNIT - I</u>	
	Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools, Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.	
	Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.	
	<u>UNIT – II</u>	
	Action Script I: ActionScript Features, Object-Oriented ActionScript, Data types and Type Checking, Classes, Authoring an ActionScript Class. Action Script II: Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.	
<u>UNIT – III</u>		
Application Development: An OOP Application Frame work, Using Components with ActionScriptMovieClip Subclasses. Multimedia data compression: Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding and Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, and Embedded Zero tree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).		
<u>UNIT – IV</u>		
Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.		

	<p style="text-align: center;"><u>UNIT – V</u></p> <p>Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications: Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand (MOD).</p>
<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/Pearson Education. 2. Essentials ActionScript 2.0, Colin Mook, SPD O, REILLY. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech. 2. Macromedia Flash MX Professional 2004 Unleashed, Pearson. 3. Multimedia and communications Technology, Steve Heath, Elsevier (Focal Press). 4. Multimedia Applications, Steinmetz, Nahrstedt, Springer. 5. Multimedia Basics by Weixel Thomson. 6. Multimedia Technology and Applications, David Hilman ,Galgotia.
<p>E-Resources</p>	<div style="border: 1px solid black; padding: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px;">  The linked image cannot be displayed. The file may have been moved, renamed, or deleted. Verify that the link points to the correct file and location. </div>

13CS42E4 - ADVANCED COMPUTER ARCHITECTURE (ELECTIVE)

Course Category	Program Elective	Credits:	4
Course Type:	Theory	Lecture – Tutorial – Practical:	4-0-0
Prerequisite:	Need to have thorough knowledge on assembling and disassembling of different types of	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Good knowledge on Parallel architectures and architectural classification
	CO2	Understanding of differences between Pipeline processing and vector processing in advanced architecture computers
	CO3	Good understanding of how SIMD computers process
	CO4	More knowledge on multiprocessing
	CO5	Gain knowledge on data flow computers
	CO6	Overall course outcome
Course Content	<p align="center"><u>UNIT - I</u></p> <p>Introduction to parallel processing: Evolution of computer systems, Parallelism in uniprocessor systems, Parallel computer structures, Architectural classification schemes, Parallel processing applications.</p> <p align="center"><u>UNIT - II</u></p> <p>Memory and Input Output subsystems: Hierarchical memory structures, Virtual memory system, Cache memory and management, Input - Output subsystems</p> <p>Principles of pipelining and vector processing: Pipelining, Instruction and Arithmetic pipelines, principles of designing pipelined processors, Vector processing requirements.</p> <p align="center"><u>UNIT - III</u></p> <p>Structures and Algorithms for Array processors: SIMD Array processor, SIMD Interconnection networks, Parallel algorithms for array processors, Associative Array processing</p> <p>SIMD computers and performance enhancement: The space of SIMD computers, Massively parallel processor, Performance enhancement methods.</p> <p align="center"><u>UNIT - IV</u></p> <p>Multiprocessor Architecture and programming: Functional structures, Interconnection networks, Parallel memory organizations, Multiprocessor operating systems, Exploiting concurrency for Multiprocessing.</p> <p align="center"><u>UNIT - V</u></p> <p>Data Flow Computers: Data driven computing and languages, Data flow computer Architecture, VLSI computing structures, VLSI matrix arithmetic process.</p>	

<p>Text Books and Reference Books:</p>	<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Computer Architecture and Parallel Processing, Kai Hwang and Faye A. Briggs. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. Advanced Computer Architecture, Kai Hwang, Tata McGraw Hill. 2. John L. Hennessey and David A. Patterson, Computer architecture – A quantitative approach, Morgan Kaufmann / Elsevier Publishers, 4th. Edition, 2007. 3. K.Hwang, Advanced Computer Architecture, Parallelism, Scalability, Programmability, McGraw Hill, 1993
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13CS42P1 - WEB TECHNOLOGIES LABORATORY

Course Category	Program Core	Credits:	2
Course Type:	Practical	Lecture – Tutorial – Practical:	0-0-3
Prerequisite:	Student needs to have knowledge in Java programming. Student need to have awareness on client- server architecture	Sessional Evaluation: Univ.Exam Evaluation: Total Marks:	40 60 100

Course Outcomes		Upon successful completion of the course, the students will be able to:
	CO1	Implementation of web based Application by using XML, JSP, PHP and MySQL.
Course Content		<ol style="list-style-type: none"> 1. Develop a static web page that demonstrates basic HTML tags. 2. Develop a web page to demonstrate different types of CSS. 3. Develop a web application using Java script to perform the following tasks: <ol style="list-style-type: none"> i) Registration validation ii) User login iii) User profile and credit card payment. 4. Design an XML document to structure the student data and validate using DTD. 5. Design an XML document to structure and display the data using an XSL. 6. Create and save an XML document at the server. Which contains user information or 7. Program to Implement Login form Using Servlets. 8. Implement a program to provide user authentication using cookies. 9. Implement a simple JSP page to perform simple functions. 10. Implement Arithmetic expressions using JSP. 11. Implement session Tracking and cookie Management in JSP. 12. Implement Arithmetic operators using PHP. 13. Write a program to implement String Operations using PHP. 14. Write a program to implement Functions with parameters using PHP. 15. Write a PHP code for creating database in MySQL. 16. Implement a Cookie based login form and get last login time using PHP
Text Books and Reference Books:		<p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 1. Dietel and Nieto, Internet & World wide Web How to Program 4ed: PHI/Pearson Education Asia. 2. Client/Server Survival Guide, 3rd Edition by Dan Harkey. <p>REFERENCES:</p> <ol style="list-style-type: none"> 1. H. Schild, The Complete Reference JAVA2, 5 ed.: Tata McGraw Hill. 2. B. Boiko, Content Management Bible. 3. S. M. Grath, XML by Example, 5 ed.: Prentice Hall of India/Pearson Education. 4. C. Bates, Web Programming building Internet Applications, 2 ed.: WILLEY Dream Tech.

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13CS42P2 – PROJECT WORK

Course Category:	Project	Credits:	6
Course Type:	Practical	Lecture-Tutorial-Practical:	0-0-3
Pre-requisite:	Basic knowledge in Computer Science Engineering Courses, modern tools in software and hardware design	Sessional Evaluation: External Exam Evaluation: Total Marks:	40 60 100

Course Objectives :	The aim of the project work to provide an opportunity for the student to develop personally and professionally by arranging and performing a project of his/her own choice in any field within the wider context of societies at an approved host institution.		
Course Outcomes	CO1	Implementation of Project and gets a knowledge on own specific area.	