Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Engineering Science	
Prerequisite	Basic knowledge of Maths	
Course Objective	1. Student will be able to solve problem based on successive differentiation and Leibnitz rule. 2. Student will be able to understand basic concept of partial differential equation. 3. Student will be able to understand the application of partial differential equation. 4. Student will be able to explain Lagrange's Method of Undetermined Multipliers. 5. Student will be able to find the rank of matrix and able to solve system of equations	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**LAB**	**Total Marks**
				SEE	**CIA**		
3	1	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Successive differentiation Expansion of functions** Review of Differentiability, Successive differentiation: nth Derivative of xm, nth Derivative of , nth Derivative of , nth Derivative of , nth Derivative of , nth Derivative of , nth Derivative of ,nth Derivative of , nth Derivative of , nth Derivative of , nth Derivative of .Use of Partial Fraction.Leibnitz theorem for the nth Derivative of the Product of two Functions (Without Proof) Determination of the value of the nth Derivative of a function for x=0	**15**	**25**
2	**Partial derivative** Function of several variables, limits & continuity, partial derivatives of the first order, partial derivatives of higher orders, differentiation of a function of a function, which variable is to be regarded as constant. Euler's theorem on homogeneous functions: homogeneous functions, Euler's theorem on homogeneous functions (without proof), total derivative, and the chain rule: Differentiation of implicit function, partial differentiation of implicit function Jacobians.	**15**	**27**
3	**Application of Partial differentiation** Geometrical Interpretation of partial Derivatives, Tangent plane and Normal line to a surface, Linearization and Linear Approximation, Partial Derivative with constrained variables, Taylor's expansions for functions of two variables, errors and approximations, Maxima and Minima of functions of two variables, working rule to find Maximum and or Minimum Values of a function f(x, y), Lagrange's method of undetermined multipliers.	**15**	**23**
4	**Matrix** Review of matrices, review of determinant, elementary row and column transformation, elementary matrices, to compute the inverse of matrices by elementary transformation (Gauss Elimination), Rank of a matrix, Normal form (Canonical form), Rank of Matrix by Triangular Form, solution of simultaneous equations, consistency of a system of linear equations, homogeneous equations, vectors, linear dependence and independence of vectors, linear dependence and independence of vectors by rank method.	**15**	**25**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	50	20	10	10	5	5

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may

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vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Student will be able to solve problem based on successive differentiation and Leibnitz rule.
CO2	Student will be able to understand basic concept of partial differential equation.
CO3	Student will be able to understand the application of partial differential equation.
CO4	Student will be able to explain Lagrange's Method of Undetermined Multipliers.
CO5	Student will be able to find the rank of matrix and able to solve system of equations

Reference Books

1.	**Higher Engineering Mathematics** By Dr. B. S. Grewal
2.	**Higher Engineering Mathematics** By B.V. Ramana, | TMG
3.	**Advance Engineering Mathematics** By R.K. Jain & S.R.K. Iyenger | Narosa Publishing House
4.	**Advanced Engineering Mathematics** By E. Kreyszig | John Wiley & Sons
5.	**Advanced Engineering Mathematics** By C.Ray Wylie & Louis C. Barrett, | TMG

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Basic knowledge of English	
Course Objective	1. Improved Language Proficiency: Enhance reading, writing, listening, and speaking skills in English. 2. Cultural Literacy: Develop an understanding of the cultural and historical context of English-speaking regions. 3. Critical Thinking: Foster analytical thinking and the ability to interpret and evaluate English texts. 4.Effective Communication: Gain confidence in expressing ideas and opinions effectively in both written and oral forms. 5.Literary Appreciation: Explore and appreciate various literary genres and styles in English literature.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	0	3	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Fundamentals of grammar** Parts of Speech (Noun, Pronoun, Adjective, Verb, Adverb, Conjunction, Preposition, Interjection) Article Tense: Application of tenses with respect to time, All tenses & their Sub-divisions	**11**	**25**
2	**Fundamentals of grammar** Forming of Sentences & Clauses, "WH's Concepts, Understanding, Sentences, Punctuation I, Degree of comparison I (Positive, Comparative & Superlative), Tenses (Introduction & Usage)	**11**	**25**
3	**Self improvement , Analyzing the body language** Self Confidence, Self Management Body gestures, Analyzing body languages, Do's and Don'ts, Impacts of body language	**12**	**25**
4	**Fundamentals of grammar** Modal Verbs, Auxilaries, Vocabulary (Roots, Prefix, Sufix, Homonyms, Synonyms & Antonyms)	**11**	**25**
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Analyze	Evaluate	Create
Weightage	25	25	25	25

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Enhance reading, writing, listening, and speaking skills in English.
CO2	Develop an understanding of the cultural and historical context of English-speaking regions.
CO3	Foster analytical thinking and the ability to interpret and evaluate English texts.
CO4	Gain confidence in expressing ideas and opinions effectively in both written and oral forms.
CO5	Explore and appreciate various literary genres and styles in English literature.

Reference Books

1.	**High School English Grammar & Composition (TextBook)** By Wren & Martin | Blackie
2.	**Learn English vocabulary at a Glance** By Dr. Rakesh Bharadwaj | Dr. Rakesh Bharadwaj

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Basic Knowledge of Physics	
Course Objective	To study the basics of Sound and waves. To observe and study characteristics of diode. To study Fiber technology Fiber technology. To learn about superconditivity and magnetic materials. Study about the nanoparticles.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	-	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Acoustics & Ultrasonic** Classification of Sound, Loudness, Weber - Fechner law, Absorption Coefficient, Reverberation, Sabine's formula, Factors affecting acoustics of buildings and their remedies. Introduction and production of ultrasonic wave, properties and detection of ultrasonic, Determination of velocity and application of ultrasonic in Engineering, Application of ultrasonic wave.	**10**	**15**
2	**Dielectrics & Band Theory** Dielectric constant, Polar and Non polar Molecules, Polarization of a Dielectric Material, Three electric vectors, Relation between Dielectric constant and susceptibility, Gauss's law in Dielectrics, Types of polarity, Energy stored in dielectric field Effective mass of Electron, Concept of hole, Energy band structure of conductors, insulator and semi conductor, Semiconductor, Intrinsic and Extrinsic semiconductor, types of diodes (simple diode, Zener diode).	**10**	**15**
3	**Lasers & Fibre Optics** Introduction of laser, Absorption, Spontaneous and Stimulated Emission, Relation between Einstein's 'A' and 'B' Coefficients, Population Inversion, Optical Pumping, Characteristics of laser beam, Action of laser, Ruby laser, Gaseous laser, Semiconductor laser, Application of Lasers. Introduction of Fibre Optics, Acceptance angle and numerical aperture, Types of fibre optics, Single and multiple modes, Mode of Propagation of wave in optical fibres, Attenuation, Signal loss and dispersion in Fibre optics advantages of Fibre optics.	**10**	**10**
4	**Superconductivity & Magnetic Material** Introduction to superconductivity, Types of Superconductor, Properties of Superconductor, Tc-Jc-Hc, Numerical based on Tc-Hc, High Tc- Low Tc superconductors, Application of super conductors, Maglev, Josephson effect, SQUID Introduction of Magnetic Materials, Basic important terms in magnetism, Classification of Magnetic Materials – Diamagnetic, Paramagnetic, Ferromagnetic, Anti ferromagnetic, Ferrimagnetic Materials. Comparison between Dia, Para and Ferromagnetic Materials.	**8**	**10**
5	**Nanophysics & Advanced Engineering Materials** Introduction to nano science-nano materials, Classification of nano structures, Synthesis Methods – Sol-Gel technique, Ball milling method, Chemical Vapour Deposition(CVD), Carbon Nanotubes (CNTs) - Properties and Applications Introduction of Metallic Glasses – Preparation (Melt Spinning Process), Properties, Applications, Shape Memory Alloys (SMA), Temperature Induced Transformation, Stress Induced Transformation, Super elasticity, Applications, Solar Cells (self study/project/poster)	**10**	**10**
	Total	**48**	**60**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy				
Level	Remembrance	Understanding	Application	Analyze
Weightage	10	20	30	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand acoustics and conditions for good hall design.
CO2	Analyze the concept of band theory, dielectric properties of solids and thereby study diode fundamentals.
CO3	Develop the ability to make proper understanding, precautions & design specific to LASER and Fiber optics components with its applications.
CO4	Discuss about superconductivity and magnetic properties of materials.
CO5	Interpret properties of nanomaterials and its applications.

Reference Books

1.	**Engineering Physics (TextBook)** By G.VIJAYAKUMARI | VIKAS | 8th
2.	**Engineering Physics (TextBook)** By K. RAJGOPALAN
3.	**Engineering Physics (TextBook)** By ABHIJIT NAYAK
4.	**Engineering Physics** By S S PATEL | ATUL PRAKASHAN

List of Practical

1.	To observe and draw the V-I characteristic of a PN Junction diode in forward bias and reverse bias.
2.	To observe and draw the V-I characteristic of a Zener diode in forward bias and reverse bias.
3.	To study x-rays diffraction.
4.	To find wavelength of sodium light using x-rays diffraction.
5.	To determine the particle size of the given lycopodium powder using laser diffraction method.
6.	To study & determine Michelson Morley experiment for spatial theory of relativity.
7.	To determine the wavelength of the given laser source of light using grating.
8.	Determine frequency of tuning fork using Sonometer.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	A basic understanding of science and mathematics.	
Course Objective	1. Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions. 2. Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving. 3. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems. 4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
4	0	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**The multidisciplinary nature of environmental studies.** Environmental Science – definition, scope & importance, Evolution of the universe, origin of the earth; solar system; atmosphere of the primitive earth, abiotic component of environment, Environmental balance**,** balance in O2 and CO2 in air; thermal balance; balance in predator and prey population.	**15**	**20**
2	**Ecology** Ecology & its branches, scope of Ecology and its relation to other divisions of sciences; autecology and synecology, Concept and structure of ecosystem, functions of ecosystem, Types of Ecosystems, Concept of habitat; Significance of ecological adaptation; ecological adaptation in plants and animals.	**15**	**20**
3	**Ecosystem** concept and scope of environmental chemistry, chemical toxicology, hazardous chemicals, carcinogens, occupier, effluent etc.The natural cycles of the environment, Ozone depletion –causes and effects; Global warming – major green house gases, causes and effects; Acid rain –causes and effects, Acid – base reactions in water.	**15**	**20**
4	**Biogeochemical cycles** Biogeochemical cycles and Environmental Pollution **Biogeochemical cycles,** Carboncycle**,** Nitrogen cycle**,** Oxygen cycle**,** Water cycle Environmental Pollution, Types of Environmental Pollution, Water Pollution, Air Pollution, Land and Noise Pollution Current Issues in environment sciences	**15**	**20**
	Total	**60**	**80**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	40	30	5	5	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
CO2	Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving
CO3	Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
CO4	Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.

Reference Books

1.	**Textbook of Environmental** By Universities Press (India) Private Ltd, Hyderabad. | Erach Bharucha Second edition,2013
2.	**Environmental Sciences** By Daniel B Botkin & Edward A Keller | John Wiley & Sons.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Zeal to learn the subject	
Course Objective	1. To objective is to impart training to help the students to develop engineering skill on basic topics of mechanical engineering. By this course student can gain knowledge of basic equipment knowledge. 2. To Looking the wide field of the engineering there is a need of basic mechanical course.	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	Tutorial	Lab	Credit	SEE	CIA	LAB	Total Marks
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Introduction** Prime movers, Sources of energy, Types of prime movers, Pressure, Work, Power, temperature, Systems and control volumes, thermodynamic properties, state and equilibrium processes and cycles, Enthalpy, Entropy, Efficiency, zeroth law of thermodynamics. Forms of Energy, energy transfer by work and heat, First and second law of thermodynamics	6	13
2	**Properties of gases** Gas laws, Boyle's law, Charle's law, Combined gas law, Gas constant, Internal energy, Relation between Cp and Cv, Enthalpy, Non flow process, Constant volume process, Constant pressure process, Isothermal process, Polytropic process, Adiabatic process.	5	12
3	**Properties of Steam** Introduction, Steam formation, Types of Steam, Enthalpy, Specific volume of steam and dryness fraction of steam, Internal energy, Steam tables, Measurement of dryness fraction, Bucket calorimeter, Throttling calorimeter, Separating calorimeter, Combined calorimeter.	6	13
4	**Heat Engines** Heat Engines and their classifications, working substances, converting machines, Essential elements of heat engines, Heat engine cycles, Carnot cycle, Rankine cycle, Ottocycle, Diesel cycle.	5	13
5	**Steam Boilers** Study of steam, boilers, fire tube and water tube boilers, its accessories and mountings.	6	13
6	**Internal Combustion Engines** Introduction, classification and brief description of I.C. engines mechanism, 4-Stroke and 2-Stroke petrol and diesel engines, Otto, Diesel and Dual cycles and their air standard efficiencies and mean effective pressures. Comparison of petrol and diesel engines. Engine efficiencies and performance	6	13

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7	**Pumps**	**4**	**8**

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	Introduction, Reciprocating pump, types and operation, Air Chamber, Centrifugal pumps, Priming, Positive displacement pumps.		
8	**Air Compressors** Introduction and classification of air compressor, Reciprocating compressors, Operation of a compressor, Work for compression, Power required, Reciprocating compressor efficiency, Rotary compressors.	4	8
9	**Refrigeration & Air Conditioning** Introduction, Refrigerant, Types of refrigerators, Vapour compression refrigerating system, Window and split air conditioners.	3	7
	Total	45	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze
Weightage	30	30	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Discuss the various sources of energy and basic terminology of Mechanical engineering
CO2	Make calculations for commonly used working fluids i.e. ideal gases and steam
CO3	Analyze various heat engine cycles and understand construction and working of IC engines
CO4	Discuss working and applications of steam boilers and various energy conversion systems

Reference Books

1. **Elements of Mechanical Engineering**
   By K. P. Roy and Prof. S. K. Hajra Chaudhary | Media Promoters & Publishers Pvt. Ltd.
2. **Fundamental of Mechanical Engineering**
   By G.S. Sawhney | Prentice Hall
3. **Elements of Mechanical Engineering**
   By N M Bhatt and J R Mehta | Mahajan Publishing House
4. **Basic Mechanical Engineering**
   By Pravin Kumar | Pearson Education
5. **Fundamental of Mechanical Engineering**
   By G.S. Sawhney | PHI Publication New Delhi
6. **Elements of Mechanical Engineering**
   By Sadhu Singh | S. Chand Publication
7. **Introduction to Engineering Materials**
   By B.K. Agrawal | McGraw Hill Publication, New Delhi

List of Practical

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1.	To demonstrate & study of different types of boilers
2.	To demonstrate & study of different types of boiler mountings & accessories
3.	To study about different types of calorimeters
4.	To demonstrate & study of I.C. engine
5.	To carry out performance test on centrifugal pump
6.	To carry out performance test on Reciprocating pump
7.	To find out different operating parameters and to do performance of two stage air compressor
8.	To study about refrigeration system & Air conditioner.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Zeal to learn the subject	
Course Objective	1. Understand the standards and common cases as well as dimensioning in technical drawings. 2. Able to develop multi-aspect sketches, sectional views and geometries of complex parts. 3. Visualize objects in all dimensions and learn displaying technique for graphical presentation of part.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
2	-	4	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Engineering Graphics** Drawing instruments and accessories, BIS – SP 46. Use of plane scales, Diagonal Scales and Representative Fraction	**2**	**10**
2	**Engineering Curves** Classification and application of Engineering Curves, Construction of Conics, Cycloidal Curves, Involutes and Spirals along with normal and tangent to each curve.	**5**	**20**
3	**Projections of Points and Lines** Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length and inclination with the reference planes.	**4**	**10**
4	**Projections of Planes** Projections of planes (polygons, circle and ellipse) with its inclination to one reference plane and with two reference planes, Concept of auxiliary plane method for projections of the plane	**4**	**10**
5	**Projections of Solids and Section of solids** Classification of solids. Projections of solids (Cylinder, Cone, Pyramid and Prism) along with frustum with its inclination to one reference plane and with two reference planes. Section of such solids and the true shape of the section	**4**	**10**
6	**Orthographic Projections** Fundamental of projection along with classification, Projections from the pictorial view of the object on the principal planes for view from front, top and sides using first angle projection method and third angle projection method, full sectional view	**6**	**20**
7	**Isometric Projections and Isometric View or Drawing**	**5**	**20**

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing		
	Total	**30**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Create
Weightage	20	20	10	10	40

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Know and understand the conventions and the methods of engineering drawing
CO2	Interpret engineering drawings using fundamental technical mathematics.
CO3	Construct basic and intermediate geometry and comprehend the theory of projection.
CO4	Improve their visualization skills so that they can apply these skills in developing new products
CO5	Improve their technical communication skill in the form of communicative drawings
CO6	Use computer software for engineering drawing.

Reference Books

1.	**A Text Book of Engineering Graphics** By P.J.Shah | S.Chand & Company Ltd
2.	**Elementary Engineering Drawing** By N.D.Bhatt | Charotar Publishing House
3.	**Engineering Drawing** By N.D.Bhatt | Charotar publication

List of Practical

1.	Lettering and Dimensioning
2.	Engineering Curves
3.	Loci of Points
4.	Projection of points and line.
5.	Projections of Plane and solid
6.	Development of surfaces
7.	Orthographic Projection.
8.	Isometric Projection.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Basic Computer Fundamentals	
Course Objective	1. To understand basic computer knowledge and programming structure 2 To Learn programs for conditional, branching looping. 3.To develop application using array, structure, function, pointer and file	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction** **Fundamental of Computer** Basic block diagram of Computer components, hardware, software, memory, generation of computer, Flowcharts and algorithm **Overview of C** Introduction, Importance of C, Sample C programs, Basic structure of C programs, Programming style, Executive a C program. **Constants, Variables, and Data Types** Introduction, Character Set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of Variables, assigning values to variables, Defining symbolic constants. **Operators and Expression** Introduction, Arithmetic of Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bit-wise Operators, Special Operators, Arithmetic Expressions, Evaluation of expressions, Precedence of arithmetic operators, Some computational problems, Type conversions in expressions, Operator precedence and associatively, Mathematical function	**15**	**20**
2	**Management Input and Output Operators** Introduction, reading a character, writing a character, formatted input, formatted output, the structure of c program input-output function **Decision-Making statement** Introduction, Decision-making with IF statement, Simple IF statement, the IF ELSE statement, Nesting of IF … ELSE statements, The ELSE IF ladder, The switch statement, the turnery (? :) Operator, the GOTO statement.	**10**	**20**
3	**Loop and arrays**	**10**	**20**

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	Decision-Making Looping Introduction, the WHILE statement, the DO statement, and The FOR statement, Jump in loops Break and continue. **Array** Introduction, One-dimensional arrays, Two-dimensional arrays, Initialization of two-dimensional arrays, Concept of Multidimensional arrays		
4	**Handling of Character strings** Introduction, Declaring and initializing string variables, reading string from the terminal, writing a string to the screen, Arithmetic operations on characters, Putting string together, String Operations String Copy, String Compare, String Concatenation and String Length, String Handling functions. **User-Defined Functions** Introduction, Need for user-defined functions, The form of C function, Return values, and their types, Calling a function, category of functions, No arguments and no return values, Arguments with return values, Handling of non-integer functions, Nesting of functions, Recursion, Functions with arrays, The scope and Lifetime of variables in functions, ANSI C functions.	**15**	**20**
5	**Structures and Unions** Introduction, Structure definition, giving values to members, Structure initialization, Comparison of structures, Arrays of structures, Arrays within structures, Structures within Structures, Structures, and functions, Unions, Size of structures, and Bit fields. **Pointers** Introduction, understanding pointers, Accessing the address of a variable, Declaring and initializing pointers, Accessing a variable through its pointer, Pointer expressions, Pointer increments and scale factor, Pointers and arrays, Pointers and character strings, Pointers and Functions, Pointers, and structures. Dynamic memory allocation. **File Management in C** Introduction, Defining files and their Operations, Error handling during I/O operations, Random access files, Command line arguments	**10**	**20**
		Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze
Weightage	10	30	30	30

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Formulate algorithm/flowchart for given arithmetic and logical problem
CO2	Translate the algorithm/flowchart into C program using the correct syntax and execute it.
CO3	Write a program using branching ,looping, iteration and recursion.
CO4	Implement simple program using structure and Union.
CO5	Implement simple program using array and pointer.

Reference Books

1.	**Let Us C (TextBook)** By Yashwant Kanetker | BPB Publication
2.	**ANSI C** By Balaguruswami | Wiley India Pvt Ltd
3.	**"Computer programming"** By Ashok N. Kamthane | Pearson Education

List of Practical

1.	Write a program to display "Hello Computer" on the screen.
2.	Write a C program to display Your Name, Address and City in different lines.
3.	Write a C program to find the area of a circle using the formula: Area = PI * r.
4.	Write a C program to print the multiply, addition, division & subtraction value of two accepted numbers.
5.	Write a C program to swap a variable value of no1 and no2.
6.	Write a program to find a maximum from given two numbers.
7.	Write a program to find a minimum from given two numbers.
8.	Write a program to find a maximum from given three numbers.
9.	Write a program to find a minimum from given three numbers.
10.	Write a C program to print a multiplication table from 1 to 12.
11.	Write a C program to find addition of 45 to 65 using loop.
12.	Write a C program to check whether a number is prime or not.
13.	Write a C program to show month using Switch statement.
14.	Write a C program to print the 3x3 array.
15.	Write C program to print range of 101 to 130 using array.
16.	Write a C program to find the length of the given string.
17.	Write a C program to copy one string into another string.
18.	Write a C program to concate (merge) the two strings.
19.	Write a C program to print the following shape.
20.	Write a C program to find the addition of two values using function.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Engineering Science	
Prerequisite	03000101-T - MATHEMATICS-I	
Course Objective	To equip students with advanced mathematical techniques and tools essential for solving complex engineering and science problems.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	1	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Review of the maxima & minima, point of inflexion, Asymptotes, Curve Tracing**	**13**	**28**
	Review of the maxima & minima, point of inflexion. Introduction of Asymptote, Types of Asymptotes: Asymptote parallel to x-axis, Asymptote parallel to y-axis, oblique Asymptote, Rules to find Asymptote parallel to x-axis, Rules to find Asymptote parallel to y-axis, Rules to find Curve Tracing oblique Asymptote, problems based on Asymptote. Multiple point, cusp, node, symmetry about x-axis, symmetry about y-axis, symmetry about x=y line, symmetry about opposite coordinate, Origin, tangent, intercept, tracing of curve.		
2	**Gamma Function & Beta Function**	**10**	**22**
	Introduction Gamma function, the value of Gamma(without proof), Problem based on Gamma function, Beta functions, Relation between Beta and Gamma function, Show that B(m, n)=B(n, m), Problem-based on Beta Function, application to the area, volume, Define Dirichlet integral, Problem-based on Dirichlet integral.		
3	**Double and triple integral**	**9**	**20**
	Introduction, Double Integral, Problems based on Double Integral, Change of order of integration, Problems based on Change of integration, Change of variables, Problem based on Change of variables, Triple integral, Problem based on Triple Integral		
4	**Differential of Vector**	**6**	**14**
	Introduction, Point function, Gradient, Problems based on Gradient of a vector, Divergence of a vector, Problems based on divergence Curl of a vector, Problems based on curl and their physical interpretations.		
5	**Integration of Vector**	**7**	**16**
	Line integral, problems based on line integral, Surface integral, problems based on Surface integral, Volume integral, Problems based on Volume integral, Green's theorem(without proof) and problems based on Green's theorem, Stoke's theorem(without proof), problems based on Stoke's theorem, Gauss divergence theorems (without proof), problems based on Gauss divergence theorems.		
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	50	20	10	10	5	5

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Student will be able to tracing a curve able to explain relation between Gamma and beta function.
CO2	Student will able to solve double and triple integral and change of variable in integral.
CO3	Student will able to understand gradient, divergence and curl.
CO4	Student will be able to use vector integration.
CO5	Student will be able to solve problem based of Green's theorem, Stock's theorem and Gauss divergence theorem.

Reference Books

1.	**Higher Engineering Mathematics** By Dr. B. S. Grewal
2.	**Advanced engineering mathematics** By Mishra V P | V P Mishra Publishers, New Delhi 2009

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Skill Enhancement Courses	
Prerequisite	An open mindset and willingness to cultivate personal growth through soft skills development.	
Course Objective	1. Effective Communication: Enhance verbal and non-verbal communication skills for interpersonal and professional success. 2. Self-Confidence: Build self-assurance and assertiveness in various personal and professional scenarios. 3. Team Collaboration: Develop teamwork, leadership, and conflict resolution skills for better collaboration. 4. Emotional Intelligence: Improve self-awareness and empathy to manage emotions and relationships effectively. 5. Adaptability and Resilience: Foster adaptability and resilience to navigate challenges and change with confidence.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	0	3	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to soft skill** Meaning and introduction to soft skill, Types of soft skill (communication, empathy, leadership, time management, observation, conflict resolution, listening skill,) Difference between soft skill and hard skill, IQ,SQ,EQ and emotion competence	**15**	**25**
2	**Habits** Guiding Principles, Identifying Good And Bad Habits, Habit Cycle; Breaking Bad Habits, Using The Zeigarnik Effect For Productivity And Personal Growth, Forming Habits of Success	**7**	**25**
3	**Personality development** Meaning of personality, elements of personality, Determents of personality, Personal development plan	**25**	**8**
4	**Self-management skill** Time management (planning, scheduling and meeting), Emotion and stress management, SWOT analysis, Etiquettes and manners, Personal grooming (Appearance, Dressing)	**15**	**25**
	Total	**62**	**83**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Analyze	Evaluate	Create
Weightage	25	25	25	25

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Effective Communication: Enhance verbal and non-verbal communication skills for interpersonal and professional success.
CO2	Self-Confidence: Build self-assurance and assertiveness in various personal and professional scenarios.
CO3	Team Collaboration: Develop teamwork, leadership, and conflict resolution skills for better collaboration.
CO4	Emotional Intelligence: Improve self-awareness and empathy to manage emotions and relationships effectively.
CO5	Adaptability and Resilience: Foster adaptability and resilience to navigate challenges and change with confidence.

Reference Books

1.	**Soft skill know the self and know the world (TextBook)** By Dr. K. Alex –S.chand | PHL learning Pvt. Ltd. New Delhi
2.	**Personal growth and wealth** By Dale Carnegie , Napoleon Hill, Dr. Joseph Murphy

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Engineering Science	
Prerequisite	Zeal to learn the subject	
Course Objective	Understand chemical principles and applications in engineering contexts and processes	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Electrochemistry** Introduction, concept of electrochemistry, Differences between Metallic Conductors and Electrolytic Conductors, Electro chemical cell (or) Galvanic cell, Differences between Galvanic cell and Electrolytic cell., Single electrode potential, Standard electrode potential, Nernst Equation,Reference Electrodes(Quinehydrone Electrode).	**12**	**25**
2	**Material Chemistry** Introduction, Polymers-classification with examples, polymerization-addition, condensation and co- polymerization Plastics: Thermoplastics and thermosetting plastics; Compounding of plastics; Preparation, properties and applications of Nylon-6, 6 RUBBER:-Natural rubber its process and vulcanization, elastomers, Buna-s Lubricants: Classification with examples, properties- viscosity, flash, fire, cloud and pour point.	**12**	**25**
3	**Corrosion And Its control** Corrosion, Causes of corrosion, Theories of corrosion, Types of corrosion, Factors effecting corrosion, Corrosion control methods, Metallic coatings	**9**	**20**
4	**Chemical Aspects of Biotechnology & Battery chemistry** **(a)Chemical aspect of Biotechnology** Definition, Benefits through biotechnology – Agriculture, Food quality, Medicines etc. Fermentation, Fermentation processes, Enzymes and its application in industries, Bio fuels and Bio membrane **(b)BATTERY CHEMISTRY** Batteries, Primary Batteries, Secondary Batteries, Differences between Primary and secondary batteries	**15**	**30**
	Total	**48**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Application	Analyze
Weightage	20	60	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	**After completion of this course students will able to** 1. Apply the knowledge of electrochemistry and its reactions.
CO2	2.Analyze the Different types of polymeric materials
CO3	3. Apply the knowledge of corrosion to prevent it
CO4	4. Understand the different aspects of biotechnology

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CO5	5. Apply the engineering chemistry knowledge in the industries

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Reference Books	
1.	**Essentials of Physical chemistry** By B. S. Bahl & Arun Bahl | S Chand, 2012
2.	**Engineering Chemistry** By Jain and Jain
3.	**'Vogel's Textbook of Quantitative Chemical analysis** By G. H. Jeffery, J. Bassett, J. Mendham & R. C. Denney | 5/E, ELBS (English Language Book Society) Longman

List of Practical	
1.	Determination of alkalinity in the given water sample
2.	Identification of Functional groups in Organic Compound systematic procedure
3.	Estimation of Chloride contents in Water sample – Argentometric Method
4.	Estimation of Dissolved Oxygen (DO) in water Sample (Winkler's method).
5.	Estimation of Hardness of Water sample – EDTA Method
6.	Determination of approximate pH of a given solution using pH indicators
7.	Determination of Molecular Weight and Degree of Polymerization – Viscometry Method

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Core Courses	
Prerequisite	Zeal to learn the subject	
Course Objective	1. The objective of this Course is to provide an introductory treatment of Engineering Mechanics to all the students of engineering, with a view to prepare a good foundation for taking up advanced courses in the area in the subsequent semesters. 2. This course provides basic fundamentals of how to determine stress and deformation in a wide range of simple, practical structural problems, and an understanding of the mechanical behavior of materials under various load conditions.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction** Scalar and vector quantities, absolute and derived units, The science of mechanics, fundamental principles, SI units.	**5**	**13**
2	**Fundamentals of Statics** Coplanar concurrent and non-concurrent force system: Resultant, Equilibrant, Free body diagrams. Coplanar concurrent forces:- Resultant of coplanar concurrent force system by analytical and graphical method, Law of triangle of forces, Law of polygon of forces, Equilibrium conditions for coplanar concurrent forces, Lami's theorem. Application of statically determinate pin – jointed structures. Coplanar non-concurrent forces:- Moments & couples, Characteristics of moment and couple, Equivalent couples, Force couple system, Varignon's theorem, Resultant of non-concurrent forces by analytical method, Equilibrium conditions of coplanar non-concurrent force system, Application of these principles.	**10**	**20**
3	**Centre of gravity and Moment of Inertia** Center of gravity of curves, plane areas and bodies, Pappus Guldinus theorem I & II, method of integration, Area moment of inertia, mass moment of inertia, M.I. of flywheel, Different methods of M.I., law of parallel axis, law of perpendicular axis	**5**	**13**
4	**Friction** Theory of friction, Types of friction, inclined plane friction, ladder friction, wedge friction, belt and rope friction	**5**	**13**
5	**Simple Lifting Machines** Velocity ratio, mechanical advantage, efficiency, reversibility, Law of machines, simple wheel & axle, differential wheel & axle, single purchase crab winch, differential wheel & axle, pulley & pulley block.	**5**	**13**

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6	**Dynamics of Particles**	**6**	**13**

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	De-Alembert's principle, motion of connected bodies, motion along inclined planes, impulse and momentum, Single degree free vibration Physical and Mechanical properties of materials:- Properties related to axial, bending and torsional and shear loading, Toughness, hardness, proof stress, factor of safety, working stress, and load factor.		
7	**Stresses & Strains** Elastic, homogeneous, isotropic materials, limit of elasticity and proportionality, yield limit, ultimate strength, strain hardening, section of composite materials, prismatic and non prismatic sections Strains:- Linear, shear, lateral, thermal and volumetric, Poisson's ratio. Stresses:- Normal stresses axial- tensile and compressive, shear and complementary shear, thermal and hoop. Applications to composite material stepped and tapered bars.	5	8
8	**Beams** Types of supports, Types of beams, Types of loads, determinate and indeterminate beams. Bending moments and Shear force , Bending moment and shear force diagrams for statically determinate beams subjected to couples, connected forces, uniformly distributed loadings, relation between bending moment, shear force and rate of loading, point of contra flexure.	4	7
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate
Weightage	30	30	10	10	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Solve practical problems of engineering by applying fundamental principles of mechanics & principles of equilibrium.
CO2	Calculate stability of systems using fundamentals of friction and its importance through simple applications.
CO3	Determine stresses and strains under axial & thermal loads.
CO4	Apply principles of statics to analyze statically determinate beams, cables and trusses.

Reference Books

1.	**Strength of Materials** By S. Ramamrutham | S.Chand Publication
2.	**Applied Mechanics** By B.Junarkar & H. J. Shah | Charotar publication
3.	**Engineering Mechanics** By M.N.Patel | Mahajan publication

List of Practical

1.	Law of parallelogram

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2.	Warm and warm Wheel

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3.	Simple Lifting Machine
4.	Lami's Theorem
5.	Simple Wheel & Axle
6.	Equilibrium of coplanar concurrent forces
7.	Equilibrium of Non-coplanar concurrent forces
8.	Single purchase crab
9.	Double purchase crab

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Core Courses	
Prerequisite	Zeal to learn the subject	
Course Objective	1. The objective is to impart training to help the students to develop engineering skill sets. 2. This exercise also aims in inculcating respect for physical work and hard labor in addition to some amount of value addition by getting exposed to interdisciplinary engineering domains.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**			**LAB**	**Total Marks**
0	0	4	4	-	-	100	100

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction & Safety** To understand the safety and secure working culture in industries and workshops. To learn safety rules of workshops. Rules and regulation in industry regarding safety act.	**15**	**25**
2	**Sheet Metal Shop** Description of tools and operations involved in sheet metal fabrication such as shearing, bending, joining (locked groves joint, riveting) Exercise like tray, Funnel etc.	**15**	**25**
3	**Fitting Shop** Introduction to tool and measuring instruments, their use, safe keeping, safety precautions Practical exercises involving sawing, filing, marking, squareness, chipping etc.	**15**	**25**
4	**Carpentry Shop** Introduction to tools, instruments and equipments required to shape wooden block. Exercise on cutting, filling and other various operations on woods.	**15**	**25**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Create
Weightage	20	20	20	40

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand various manufacturing processes in machine shop and perform basic operations of welding, fitting, smithy and carpentry work. a) Perform basic operations of welding, fitting, smithy and carpentry work. b) Explain various manufacturing processes in machine shop.
CO2	Discuss application of plumbing fitting, masonry items and about plastic molding and glass cutting for various engineering application.
CO3	Measure different electrical quantities and trouble shoot electrical and electronics appliances
CO4	Conduct experiments with various kits such as Raspberry and Adriano for embedded system Development.
CO5	Use basic commands of computer operating systems

Reference Books

1.	**Workshop Technology Vol. II** By Hajra Choudhari | MPP Ltd
2.	**Workshop technology** By R.S. Khurmi | S. chand publication
3.	**Workshop Technology** By B.S.Raghuvanshi | Dhanpat Rai & Co

List of Practical

1.	Case study on Industrial safety and management.
2.	To prepare a job for sheet metal operation
3.	To prepare a job for Carpentry shop
4.	To prepare a job for fitting shop

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Core Courses	
Prerequisite	03000101 - MATHEMATICS-I	
Course Objective	1. To study and understand the role of civil engineering in national development. 2. To study the various branch of civil engineering and their scope. 3. To do different surveys like chain survey, compass survey for measurement of ground.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	-	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction and Water Resources and Hydraulics** • Impact of Infrastructural Development on the Economy of a Country. • Role of Civil Engineers, Importance of Planning. • Scheduling and Construction management. Collection and conveyance of raw water from source **Water Resources and Hydraulics** • Importance of Hydrology, Classification of Water resources & Requirement of water for Various uses. • Water Management Strategies, Water Resources Development in India. • Introduction of Dams, Introduction of water supply and Drainage System.	**7**	**15**
2	**Surveying** **Chain Survey:-** • Linear measurements, Errors in chaining, problems on obstacle **Directions and Bearings:-** • Types of Bearings and Meridians, Whole Circle Bearing and Quarter Circle Bearings, • Compunctions of Angles from bearings and bearings from angle, Magnetic Declination, Local Attraction, Various Problems. **Elevation Measurements:-** • Introduction of Level Machine, Methods of leveling, Recording and Reducing of levels, Contour Survey. **Area and volume:** • Measurement by Planimeter. **Modern Tools of Surveying and Mapping:** • Introduction to Theodolite, Electronic Distance Measurement Instruments, Total Station.	**26**	**55**
3	**Construction Materials** Introduction, Masonry Materials: Stones, Bricks, Blocks, Tiles; Binding Materials: Lime & Cement; Aggregates, Mortar & Concrete, Timber, Specification of all Building Materials as per IS Standards, Method of Drawing Plan, Elevation and Section of Building.	**6**	**15**
4	**Transportation Engineering** • Role of Transportation in National development, Transportation Ways, Surface Transportation and Aviation. • Elements of Highway materials properties and highway Construction, BOT Projects for Highways, Elements of Traffic Engineering and Traffic Control.	**6**	**15**
	Total	**45**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	25	40	25	5	5	0

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Recognize the significance of civil engineering in routine life, the importance of surveying, importance, and use different equipments for linear measurements
CO2	Learn to use different equipments for angular measurements
CO3	Learn to use different equipments for Elevation Measurements
CO4	Learn about construction materials
CO5	Describe various public transportation system, water conservation methods, water -waste water quality and advances in civil engineering

Reference Books

1.	**1. Elements of civil engineering** By B.C.Punamia | Lakshmi Publication
2.	**Elements of Civil Engineering (TextBook)** By Dr. R. P. Retaliya | Atul Prakashan
3.	**Elements of civil engineering** By R. K. Jain | Tata McGraw Hill Pub. Co. New Delhi.
4.	**Elements of civil engineering** By R. B. Khasiya | Mahajan Publication

List of Practical

1.	Introduction To Surveying Lab
2.	chaining of a survey line
3.	Ranging and chaining of a survey line
4.	Study of prismatic compass
5.	Traversing using prismatic compass
6.	Study and use of dumpy level
7.	Study and use of dumpy level and simple levelling
8.	Study and use of dumpy level and Reciprocal levelling
9.	Study of theodolite and its uses
10.	Introduction to Construction Material Testing Lab

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Core Courses	
Prerequisite	Basic knowledge of Mathematics and Physics	
Course Objective	1. Understand the basic terminology/definitions of electrical and electronics engineering 2. Apply the knowledge of theorems/laws to analyze the simple circuits 3. Use the principles of electromagnetic induction in electrical applications	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction** **DC Circuits:** Electrical circuit elements (R, L, and C), voltage and current sources, Kirchhoff's current and voltage laws, and analysis of simple circuits with dc excitation. Superposition, Thévenin, and Norton Theorems. Time-domain analysis of first-order RL and RC circuits	**10**	**20**
2	**AC Circuits** Representation of sinusoidal waveforms, peak and RMS values, Phasor representation of AC quantities, real power, reactive power, apparent power, and power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), and Series and parallel resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections, Power measurement in three-phase circuits.	**10**	**25**
3	**Transformers** Magnetic materials, BH characteristics. Construction and working principle of single phase and three phase transformers. Ideal and practical transformer. Auto-transformer and its applications.	**10**	**15**
4	**Electrical Machines** Generation of rotating magnetic fields. Construction and working of the following machines: Three-phase induction motor, Single-phase induction motor, Separately excited DC motor, and Synchronous generators.	**10**	**20**
5	**Electrical Installations Components of LT Switchgear** Switch Fuse Unit (SFU), MCB, ELCB, MCCB. Types of Wires and Cables. Earthing – Types of Earthing and its importance. Safety precautions for electrical appliances. Types of Batteries, Important Characteristics for Batteries. Elementary calculations for energy consumption. Basics of power factor improvement.	**10**	**20**
	Total	**50**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	40	20	20	20	0	0

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Apply fundamental electrical laws and circuit theorems to electrical circuits.
CO2	Compare Ac and Dc circuits and apply their concepts to practical problems.
CO3	Analyse single-phase and three-phase AC circuits.
CO4	Describe the operating principle and applications of static and rotating electrical machines.
CO5	Comprehend electrical installations, their protection, and personnel safety.

Reference Books

1.	**BASIC ELECTRICAL AND ELECTRONICS ENGINEERINGUNIVERSITY SCIENCE PRESS** By R. K. Rajput | UNIVERSITY SCIENCE PRESS | Second, Pub. Year 2012
2.	**Basic Electrical Engineering (TextBook)** By U. A. Bakshi, V. U. Bakshi | Technical Publications Pune | Second Revised Edition, Pub. Year 2009
3.	**Basics Of Electrical Engineering (TextBook)** By J.S. Katre | Khanna publication, New Delhi, Pub. Year 2011
4.	**Elements of Electrical Engineering (TextBook)** By U. A. Patel | Atul Prakashan , Ahmedabad
5.	**ELEMENTS OF ELECTRICAL ENGINEERING (TextBook)** By J. N. SWAMY, N. V. SINHA | MAHAJAN PUBLISHING HOUSE | NINTH, Pub. Year 2013
6.	**Electrical Technology** By Thereja B.L. | S. Chand & Company Ltd; New Delhi, Pub. Year 2010

List of Practical

1.	Verification of Kirchhoff's law.
2.	Perform series and parallel combination of resistors.
3.	Measurement of active and reactive power in single phase A.C. Circuit.
4.	Measurement of impedance of R-L, R-C & R-L-C series circuit and study of resonance phenomenon.
5.	To Measure the active reactive power in 3Φcircuit. To Measure the power factor.
6.	To study star and delta connection on three phase circuit and verify equivalent circuit.
7.	To perform(a) turn ratio and polarity test on single phase transformer. (b) Conversion of the two-winding transformer into autotransformer.
8.	To determine the efficiency and voltage regulation of a single-phase transformer by load test.
9.	To perform open circuit & short circuit tests on a single-phase transformer.
10.	Draw the symbols of different types of protection devices.

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11.	Draw a chart of different types of switches, connectors and wirings.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 3**
Type of Course	Core Courses	
Prerequisite	Basic knowledge of Maths	
Course Objective	1. Student will be able to learn concepts of ordinary differential equation and able to solve differential equation. 2. Student will able to solve nth order differential equation, differential equation with constant coefficient and variable coefficient. 3. Student will be able to use Frobenius method. 4. Student will be able to solve problem based on Laplace transformation. 5. Student will be able to explain Fourier series.	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	1	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**First order ODE Application of differential equations of first order.** Definition, practical approach to differential equations, formation of a differential equation-Geometrical meaning, equation of the first order and first degree, Variable separable, homogeneous equations, equation reducible to homogeneous form, linear equations, Bernoulli's equation, exact equations, equation reducible to exact equation. Orthogonal trajectories.	12	26
2	**Linear differential equations of nth order** Linear differential equations of nth order with constant coefficients, Complementary functions and particular integrals, Method of variation of parameters, Method of undetermined coefficients. Cauchy's and Legendre's linear equations, linear dependence of solutions, Applications to engineering problems (without derivation).	11	24
3	**Series Solution of Differential Equation and Special Functions** Series solution of ordinary differential equations of 2nd order with variable coefficients (Frobenius Method),Bessel and Legendre equations and their series solutions, Properties of Bessel functions and Legendre polynomials	7	16
4	**Laplace Transform** Laplace transform, Existence theorem, Laplace transform of derivatives and integrals, Inverse Laplace transform, Unit step function, Dirac delta function, Laplace transform of periodic functions, Convolution theorem, Application to solve simple linear and simultaneous differential equations	9	21
5	**Fourier series** Periodic functions, Trigonometric series, Fourier series of period 2π, Euler's formulae, Functions having arbitrary period, Change of interval, Even and odd functions, Half range sine and cosine series.	6	13
	Total	45	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	50	20	10	10	5	5

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Student will be able to learn concepts of ordinary differential equation and able to solve differential equation.
CO2	Student will able to solve nth order differential equation, differential equation with constant coefficient and variable coefficient.
CO3	Student will be able to use Frobenius method.
CO4	Student will be able to solve problem based on Laplace transformation.
CO5	Student will be able to explain Fourier series.

Reference Books

1.	**Higher Engineering Mathematics** By B.V. Ramana, | TMG
2.	**Advance Engineering Mathematics** By R.K. Jain & S.R.K. Iyenger | Narosa Publishing House
3.	**Higher Engineering Mathematics** By Dr. B. S. Grewal
4.	**Advanced Engineering Mathematics** By E. Kreyszig | John Wiley & Sons
5.	**Ordinary and Partial Differential Equations** By M.D. Raisinghania | S. Chand Publishing | Twentieth edition, Pub. Year 2020

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Course	Bachelor of Technology (B.Tech.)	**Semester - 3**
Type of Course	Skill Enhancement Courses	
Prerequisite	Proficiency in the language of instruction (usually English) and a basic understanding of academic writing conventions.	
Course Objective	1. Clarity and Precision: Develop the ability to express complex ideas clearly and concisely. 2. Research Proficiency: Acquire skills in conducting and citing academic research effectively. 3. Critical Thinking: Enhance critical analysis and argumentation skills in writing. 4. Citation and Referencing: Master proper citation and referencing formats, such as APA or MLA. 5. Academic Integrity: Promote ethical writing practices and avoid plagiarism in academic work.	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	Tutorial	Lab	Credit	SEE	CIA	LAB	Total Marks
3	0	0	3	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Academic & research writing** Introduction; Importance of academic writing; Basic rules of academic writing, English in academic writing I & II; Styles of research writing.	10	25
2	**Plagiarism:** Introduction: Tools for the detection of plagiarism; Avoiding plagiarism, Literature review: Introduction, Source of literature; Process of literature review, Online literature databases; Literature management tools, referencing and citations	12	25
3	**Report** Report writing for an event, CV writing, Job Application, Types of letters- Business letters, Cover letter.	11	25
4	**E-Mails** Memo, Notice, Agenda, Minutes of Meeting, Business correspondence, How to write emails- do's and don'ts	11	25
	Total	44	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Analyze	Evaluate	Create
Weightage	25	25	25	25

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Clarity and Precision: Develop the ability to express complex ideas clearly and concisely.
CO2	Research Proficiency: Acquire skills in conducting and citing academic research effectively.
CO3	Critical Thinking: Enhance critical analysis and argumentation skills in writing.
CO4	Citation and Referencing: Master proper citation and referencing formats, such as APA or MLA.
CO5	Academic Integrity: Promote ethical writing practices and avoid plagiarism in academic work.

Reference Books

1.	**Academic Writing, Anti- Plagiarism And Citations (TextBook)** By Vinod Kumar Kanvaria | Shipra Publications

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Course	Bachelor of Technology (B.Tech.)	**Semester - 3**
Type of Course	Core Courses	
Prerequisite	03050201-T - ELEMENTS OF ELECTRICAL ENGINEERING	
Course Objective	1. To understand fundamentals of Basic Electronics 2. To understand application of Electronics devices.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Energy Bands in Solids** Charged Particles, Field Intensity, Potential Energy, The eV Unit of Energy, The Nature of the Atom, Atomic Energy Levels, Electronic Structure of The Elements, The Energy Band Theory of Crystals, Insulators, Semiconductors, and Metals.	**8**	**15**
2	**Transport Phenomena in Semiconductors** Mobility and Conductivity, Electrons and Holes in an Intrinsic Semiconductor, Donor and Acceptor Impurities, Charge Densities in a Semiconductor, Electrical Properties of Ge and Si, The Hall Effect, Conductivity Modulation, Generation and Recombination of Charges. Diffusion, The Continuity Equation, Injected Minority –Carrier Charge, The Potential Variation within a Graded Semiconductor	**10**	**20**
3	**Junction Diode Characteristics** Open –Circuited p-n Junction, p-n Junction as a Rectifier, Current Components in a p-n Diode, Volt-Ampere Characteristic, Temperature Dependence of the V/I Characteristic, Diode Resistance, Space Charge, Transition Capacitance, Charge-Control Description of a Diode, Diffusion Capacitance Junction Diode Switching Times, Breakdown Diodes, Tunnel Diode, Semiconductor Photodiode, Photovoltaic Effect, Light –Emitting Diodes.	**12**	**20**
4	**Diode Circuits** Diode as a Circuit Element, Load-Line Concept, Piecewise Linear Diode Model, Clipping Circuits, Clipping at Two Independent Levels, Comparators. Sampling Gate, Rectifiers, Other Full-Wave Circuits, Capacitor Filters, Additional Diode Circuits	**10**	**20**
5	**Transistor Characteristics** Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, CB Configuration, CE Configuration, CE Cutoff region, CE Saturation Region, Typical Transistor, CE Current Gain, CC Configuration, Analytical Expressions for Transistor Characteristics Maximum Voltage Rating, Phototransistor	**10**	**25**
	Total	**50**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	20	20	20	20	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	To Understand the Electronics structure of the elements and energy band theory of crystals
CO2	To understand transport phenomena in a semiconducting material.
CO3	To Compare the different Diode Characteristics.
CO4	To Explain the different Diode circuits and Analyze the performance of circuits
CO5	To Define Transistor configuration and Analyze transistor characteristics.

Reference Books

1.	**BASIC ELECTRONICS (TextBook)** By JIGAR H. SHAH | ATUL PRAKASHAN | FIFTH, Pub. Year 2013
2.	**BASIC ELECTRICAL AND ELECTRONICS ENGINEERINGUNIVERSITY SCIENCE PRESS** By R. K. Rajput | UNIVERSITY SCIENCE PRESS | Second, Pub. Year 2012
3.	**Integrated Electronics** By Jacob Millman, Christos C. Halkias | Tata Mac-Grawhill
4.	**Electronic Devices And Circuit Theory** By Robert Boylestad, Louis Nashelsky | Prentice Hall

List of Practical

1.	To obtain V-I characteristic of P-N junction diode in forward Bias.
2.	To obtain V-I characteristic of P-N junction diode in Reverse Bias.
3.	To obtain V-I characteristics of Zener diode in forward bias.
4.	To obtain V-I characteristics of Zener diode in reverse bias.
5.	To obtain output waveforms of half wave rectifier.
6.	To obtain output waveforms of full wave rectifier.
7.	To obtain output waveforms of Bridge wave rectifier.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 3**
Type of Course	Core Courses	
Prerequisite	03050201-T - ELEMENTS OF ELECTRICAL ENGINEERING	
Course Objective	1. Understanding of principle, operation, and analysis of digital electronics. 2. Represent various number systems & perform conversions among them. 3. Design digital combinational circuits. 4. Analyze sequential digital circuits like flip-flops, registers, and counters. 5. Introduction to processor and controller.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Binary number system and logic gates** Digital computer and digital systems, Binary Numbers, Number base conversion Octal and Hexadecimal Numbers, complements, Binary Codes, Binary Storage and register, Binary Logic, and Integrated Circuit. Various Codes like Weighted, EXCESS-3, Grey codes, ASCII codes, and Code Conversion. Introduction, Laws of Boolean algebra, Demorgan's theorem, Positive and Negative logic, Basic logic gates: AND, OR, NOT, XOR, XNOR GATES & Respective Boolean Function, Truth table, Universal Logic Gates, NAND, NOR, etc.	**12**	**25**
2	**Combinational Logic Design** Review of Boolean Algebra and De Morgan's Theorem, SOP & POS forms, Canonical forms, Karnaugh's maps, don't care conditions, Half and Full Adders, Subtractors, Serial and Parallel Adders, BCD Adder. decimal adder, magnitude comparator, decoder, demultiplexer, multiplexer, ROM, and Programmable Logic Array.	**10**	**20**
3	**Sequential Logic Design** Latch, R-S, J-K master-slave, J-K, D-type flip-flops, Triggering of flip-flops, Analysis, and design of sequential circuits using state tables, diagrams, equation reductions, and assignments. Registers, left shift, right shift, serial-parallel input-output combinations, ripple, and synchronous counters, Up-Down counting, word time generation, Johnson counter. Timing Sequences, Memory Unit	**12**	**25**
4	**Logic Families and Semiconductor Memories** Introduction, Bipolar transistor characteristics, characteristics of RTL, DTL, IIL, TTL, MOS, CMOS, ECL CIRCUITS. Specifications, Noise margin, Propagation delay, fan-in, fan-out, etc.	**6**	**15**
5	**Processor & Control Logic Design** Introduction, Processor organization, Arithmetic logic unit, Design of ALU, Status register, design of shifter, Processor Unit, and Design of accumulator. Introduction, Control Organization, Hard-Wired Control, Micro-Program Control.	**6**	**15**

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Total	**46**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	20	20	20	20	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Apply knowledge of Boolean algebra and other minimization techniques for digital circuit design.
CO2	Identify, formulate, and solve a problem based on combinational and sequential circuits.
CO3	Select the appropriate hardware and software tools for combinational and sequential circuit design.
CO4	To Understand the basics of semiconductor devices and logic families.
CO5	To Understand the fundamentals of processor and controller.

Reference Books

1.	**DIGITAL ELECTRONICS** By G. K. KHARATE | OXFORD UNIVERSITY PRESS | FOURTH, Pub. Year 2011
2.	**Digital Logic And Computer Design** By Morrismano | PHI
3.	**Digital Principles And Applications** By Malvino And Leach
4.	**Modern Digital Electronics"** By R. P. Jain | TMH

List of Practical

1.	To study the basic logic gates: AND, OR, NOT, XOR, XNOR.
2.	To study and verify universal gates and: NAND, NOR.
3.	To study Boolean algebra and Demorgan‟s theorem.
4.	To study full-adder and half-adder circuits.
5.	Code Converter Circuit – Binary to Grey and Grey to Binary.
6.	To study magnitude comparator – 4 bit and 8 bit
7.	To implement an 8 X 1 multiplexer.
8.	To verify various flip-flops: SR, D, T, and JK.
9.	To study counters: BCD counter.
10.	To study TTL logic and CMOS logic of gate implementation.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 3**
Type of Course	Core Courses	
Prerequisite	03080101-T - PROGRAMMING IN C	
Course Objective	1. To organizing data for implementation of efficient algorithms and program development. 2. To develop the capability of selecting a particular data structure. 3. To develop application using array, structure, function, pointer and file	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Data Structure, Types of Data Structures** Introduction to Data Structure and Algorithm Data Types, primitive and non-primitive Performance Analysis and Measurement Linear & Non Linear Data Structures. String, Introduction, Operation performed on string Array, Introduction to Arrays, Linear array and its representation Binary Search and Linear Search with algorithm Pointers, Records and its representations., Recursion, Tower of Hanoi	**10**	**15**
2	**Link List, Stack, Queue (Linear data Structure)** Introduction of stack, PUSH and POP operation along with algorithms, Application of Stack Expression Conversion: Prefix, Postfix ,Infix Link List Introduction, Types of Link List, Operations along with Algorithms-Insert, Delete, Search, Traverse, Application Queue types and Representation of Queue -Simple, Circular, Dequeue, Priority Operations Performed on Queue-Insert, delete, search, Application of Queue	**15**	**20**
3	**Tree and Graphs-(Non Linear)** Introduction of different trees and its representations, Types of Tree, Traversal algorithm, Binary search tree, Insert, Delete, Search in tree, Conversion of General Trees To Binary Trees, Applications Of Trees, Heap tree Graphs, Basic Terminology and Representation, Traversal of Graph, Sequential representation of graphs, Link list of graph, Graph-Matrix Representation of Graphs, Operations on graphs	**15**	**20**
4	**Hashing and File Structure, File Organization** Hashing, Hash Table, Hash Function, Hashing Technique, Collision, Collision Resolution Techniques File Organization, Introduction to File, Types of File Organization, Concepts of fields, records and files, Sequential, Indexed and Relative/Random File Organization, Indexing structure for index files, hashing for direct files, Multi-Key file organization and access methods.	**10**	**20**
5	**Sorting and Searching** Sorting types, Insertion, sort, Selection Sort, Quick Sort, Merge Sort, Radix sort, Searching types, Sequential Search and Binary Search	**10**	**25**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	10	15	15	20	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Discuss The Basic Concept and Principle of Data Structure
CO2	Implement Data Strcuture And Algorithm to Solve Problem.
CO3	Learn the Basic Techniques of Algorithm Analysis
CO4	Descibe various Tree and Graph travsersal Algorithm
CO5	Differentiate Primitive and Non Primitive Structures

Reference Books

1.	**An Introduction to Data Structures with Applications. (TextBook)** By Jean-Paul Tremblay & Paul G. Sorenson | Tata McGraw Hill.
2.	**Data Structures using C & C++** By Ten Baum | Prenctice-Hall International
3.	**Fundamentals of Computer Algorithms by** By Horowitz, Sahni | Galgotia Pub. 2001 ed.

List of Practical

1.	Write a C program to display linear array elements.
2.	Write a C program to calculate length of a given string.
3.	Write a C program to perform index operation on a given String.
4.	Write a C program to Concate two String.
5.	Write a C program to find Sub string of given string.
6.	Write a C program to implement PUSH and POP operation of STACK.
7.	Write program to implement simple queue using C language.
8.	Write a C program to search an element using linear search.
9.	Write a C program to search an element using Binary search
10.	Write a C program to sort given list using Insertion sort
11.	Write a C program of matrix addition
12.	Write a C program of matrix multiplication.
13.	Write a C program to traverse single linked list.
14.	Write a C program to implement Bubble sort.
15.	Write a C program to implement Radix sort.
16.	Write a C program to implement Merge sort.
17.	Write a C program to implement Selection sort.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 3**
Type of Course	Core Courses	
Prerequisite	03080101-T - PROGRAMMING IN C	
Course Objective	1. To understand the Fundamental of Database Management System, RDBMS and locking mechanism. 2. To learn the fundamental of data models and SQL query. 3. To develop application using PL/SQL blocks.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction, Data Models** What is database system, purpose of database system, view of data, Types of Databases, database architecture, transaction management Hierarchical data model, Network data model, Relational Data model	**8**	**15**
2	**Relational Database Design and E-R Model, E-R Model, Normalization** Structure of Relational databases, Domains, Relations, Relational algebra – fundamental operators and syntax, relational algebra queries, tuple relational calculus Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams, weak entity sets, extended E-R features – generalization, specialization, aggregation, reduction to E-R database schema, Data redundancy Normal forms 1NF, 2NF, 3NF, BCNF and 4NF	**12**	**15**
3	**Structured Query Language, Constraints, Functions, Advanced Query** Introduction to SQL, DDL, DML, DCL, TCL. Basic commands and Functions of SQL, Data Definition Language (DDL), Data Manipulation language (DML),Data Control Language (DCL), Transaction control Language (TCL) and all related commands, Use of Group by, Having, order by Primary key, foreign key, unique, not null, check, IN operator Aggregate functions, Built-in functions –numeric, date, string functions Set operations, Sub-queries and correlated sub-queries, Join and types of Join	**20**	**30**
4	**Introduction to PL/SQL, Basics of PL/SQL** The PL/SQL Syntax, The PL/SQL Block Structure, Fundamentals of PL/SQL, Advantages of PL/SQL data Types. Advanced SQL features such as updatable views, stored procedures, Triggers	**10**	**30**
5	**Transaction Management and Concurrency Control** Transaction concepts, ACID properties, Serializability and Concurrency Control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, optimistic methods, database recovery management.	**10**	**10**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	15	25	20	20	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Discuss the fundamental concepts of relational database and SQL
CO2	Understand the Syntax, Block Structure and Fundamental of PL/SQL
CO3	Use ER model for Relational model mapping to perform database design effectively
CO4	Outline the various storage and optimization techniques
CO5	Summarize the properties of transactions and concurrency control mechanisms

Reference Books

1.	**Fundamentals of Database Systems** Pearson Education, Pub. Year 2006
2.	**An introduction to Database Systems (TextBook)** By Desai Bipin C. | Pearson Education Asia | 7, Pub. Year 2001

List of Practical

1.	Perform the following : (a) View all databases, create a database of university, select that database and view all table in it. (b) Perform DDL commands (create, Alter, Truncate, Drop).
2.	Perform DML (insert, update, delete) and DQL commands on student_info table.
3.	Retrieve details from student_info table using distinct, order by clause and LIMIT clause.
4.	Create customers table using Constraints with given Attributes: Customer_id – Primary key, Auto increment, Customer_name – Not Null, Contact_no – Unique key, City – Not Null.
5.	Retrieve details from customers table using group by clause.
6.	Create Product table with given attributes and Perform Aggregate functions (count, sum, avg, min, max) on product table. Product_id – Primary key, Product_name - Not Null, Quantity – Not Null, Price – Not Null.
7.	Perform Numeric functions (sqrt, abs, floor, ceiling, round, square, power) on product table.
8.	Perform String functions (ASCII, Char, Concat, Concat_ws, Left, Right, Lower, Upper, Ltrim, Rtrim, Trim, Reverse, substring, replace) on student_info table.
9.	Perform Date functions (NOW, CURDATE, CURTIME, DATE, EXTRACT) on student_info table.
10.	Apply check and default constraints on customers table.
11.	Retrieve details from customers table using IN operator.
12.	Perform join (inner, left, right, full outer) on tables.
13.	Write a Subquery to transfer all the records from one table to another.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 3**
Type of Course	Core Courses	
Prerequisite	03080101-T - PROGRAMMING IN C	
Course Objective	1. Allow programmers to think in terms of the structure of the problem rather than in terms of the structure of the computer. 2. Decompose the problem into a set of objects 3. Objects interact with each other to solve the problem	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction of OOPS, Principles of OOP, C++ Basics** Introduction to Object Oriented Programming, Difference between Procedure Oriented and Object Oriented Programming, Difference between C and C++ Class, Object, Inheritance, Polymorphism, Dynamic Binding, Message Passing Programming Structure, Variables in C++, C++ Output/ Input, Keywords in C++, New style of the header file specification, Comments in C++, Token, Enum, Typecasting, Operators, Control Structures, Default Arguments, Scope Resolution Operator, New and Delete Operator, Manipulators	**15**	**25**
2	**Classes, Object and Function, Constructor & Destructor** Introduction to Class and Objects, Access Specifier, Memory Allocation for an object, Simple Function, Call and Return by Reference, Static data, Function and Members, Inline Function, Function Overloading, Friend Functions, Friend Class, Array of Class Object. Constructor, Characteristics of Constructor, Types of Constructor, Destructor, Characteristics of Destructor	**15**	**20**
3	**Inheritance** Introduction, Advantages of Inheritance, Inheritance using different access Specifiers, Initialization of Base class members through a derived class object, Different forms of Inheritance, Virtual Base Classes, Abstract Class, Function Overriding.	**10**	**20**
4	**Operator Overloading** Introduction to Operator overloaded, Rules for Overloading Operator, Declaration of Operator Overloading, Unary Operator Overloading, Binary Operator Overloading, Data Conversion, and Type Conversions	**10**	**15**
5	**Files & Pointers** C++ Streams, C++ Streams Classes, I/O Operations, Open, and Close File, Read/write modes in C++, Managing Output with Manipulators, File Modes and File Pointers, Pointer to constant and constant to Pointer	**10**	**20**
	Total	**60**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	25	25	10	10	10	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Learn the Basic concept of C++ programming & understand the fundamental principles of the OOP concept.
CO2	How to write a C++ program using the concept of Classes, Objects, Functions, Constructors & Destructors.
CO3	Understing the concept of inheritance & polymorphism along with the method over-loading concept.
CO4	Implement the concept of operator Overloading.
CO5	Implement the concept of Files & Pointers using functions.

Reference Books

1.	**Let us C++** By Y kanitkar | BPB Publication
2.	**Object Oriented Programming with C++ (TextBook)** By E Balaguruswami | The Mc Graw-Hill Education India Pvt. Ltd

List of Practical

1.	Write a program to print “Hello World”.
2.	Write a program to perform operation of calculator.
3.	Write a program to add two numbers by using the function.
4.	Write a program to swap two numbers.
5.	Write a program to check whether number is even or odd.
6.	Write a program to find the largest number among three numbers.
7.	Write a program to generate multiplication table of a given number.
8.	Write a program to reverse a number.
9.	Write a program to calculate the power of a number.
10.	Write a program to multiply two numbers.
11.	Write a program to subtract complex number using operator overloading.
12.	Write a program to check whether a number is palindrome or not.
13.	Write a program to check whether a number is prime or not.
14.	Write a program to find the length of a string.
15.	Write a program to concatenate two strings.
16.	Write a program to write content of a file “studentmarks.txt”.
17.	Write a program to read from file “studentmarks.txt”.
18.	Write a program using a copy constructor to copy an object's data to another entity.
19.	Write a program of multiple inheritance.

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20.	Write a program which illustrates the use of the parameterized constructor.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 4**
Type of Course	Core Courses	
Prerequisite	Basic knowledge of Maths	
Course Objective	1. Student will be able to solve problem based on analytic function and harmonic function. 2. Student will be able to solve integration of complex function and understand contour integral. 3. Student will be able to find zeros of transcendental and polynomial equation. 4. Student will be able to use Bisection method, Regula Falsi method, and Newton-Raphson method to solve. 5. Student will be able to solve to problem based on interpolation and numerical integral and differentiation.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SSE**	**CIA**	**LAB**	**Total Marks**
3	1	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Function of Complex variable** Analytic function, C-R equations, Theorem on C-R equation(without proof), C-R equation in polar form, Properties of Analytic Functions (orthogonal system), Laplace Equation, Harmonic Functions, Determination of Analytic function Whose real or Imaginary part is known : (1) When u is given, v can be determined (2) When v is given, u can be determined (3) By Milne-Thompson method and Finding Harmonic Conjugate functions. Conformal Mapping and its applications: Define conformal Mapping, Some standard conformal transformations: (1) Translation (2) Rotation and Magnification (3) Inversion and Reflection.	**13**	**28**
2	**Complex Integration** Definition of the complex line integral, Problem based on complex line integral. Cauchy's integral theorem (without proof), Cauchy's integral formula for derivatives of an analytic function, problem based on Cauchy's integral theorem & Cauchy's integral formula. Expansion of function in Power Series, Taylor's series and Laurent's series, singularities, Residue, find the Residue of the function, Cauchy's Residue theorem (Without proof).	**10**	**22**
3	**Zeroes of transcendental and polynomial equation** Zeroes of the transcendental and polynomial equation using Bisection method, Rate of convergence of Bisection method, Problem based on it, Regula-Falsi method, Rate of convergence of Regula-Falsi method, problem based on it, Newton-Raphson method, Rate of convergence of Newton-Raphson method, problem based on it.	**7**	**16**
4	**Interpolation** Finite differences, difference tables, Newton's forward interpolation & it's problems, Newton's backward interpolation & it's problems, Newton's divided difference formula for unequal intervals & it's problems ,Lagrange's divided difference formula for unequal intervals & it's problems	**8**	**18**
5	**Numerical integration & Numerical Differentiation** Trapezoidal method & it's problems method, Simpson's one third and three-eight rules & problem based on Simpson's one third and three-eight rules Solution of ordinary differential equations by following methods: Euler's Method, Picard's Method and forth-order Runge- Kutta methods & it's problems	**7**	**16**
	Total	**45**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	50	20	10	10	5	5

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Student will be able to solve problem based on analytic function and harmonic function.
CO2	Student will be able to solve integration of complex function and understand contour integral.
CO3	Student will be able to find zeros of transcendental and polynomial equation.
CO4	Student will be able to use Bisection method, Regula Falsi method, and Newton-Raphson method to solve.
CO5	Student will be able to solve to problem based on interpolation and numerical integral and differentiation.

Reference Books

1.	**Advance Engineering Mathematics** By R.K. Jain & S.R.K. Iyenger | Narosa Publishing House
2.	**Advanced Engineering Mathematics** By E. Kreyszig | John Wiley & Sons
3.	**Advanced Engineering Mathematics** By C.Ray Wylie & Louis C. Barrett, | TMG
4.	**Complex variables and Applications** By J. W. Brown and R. V. Churchill | McGraw Hills | 9th, Pub. Year 2021

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Course	Bachelor of Technology (B.Tech.)	**Semester - 4**
Type of Course	Skill Enhancement Courses	
Prerequisite	Basic communication skills and a willingness to develop public speaking and corporate communication abilities.	
Course Objective	1. Confident Public Speaking: Develop the ability to speak confidently and persuasively in various public settings. 2. Effective Business Communication: Master skills for clear, concise, and impactful communication in corporate environments. 3. Presentation Skills: Create and deliver engaging and informative presentations for professional success. 4.Interpersonal Effectiveness: Enhance relationship-building, negotiation, and conflict resolution skills. 5.Crisis Communication: Learn to navigate and communicate effectively during challenging situations in the corporate world.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	0	3	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Interview & types** Preparation for interview-do's and don'ts-self introduction. How to handle rejections. Selection test-types	**10**	**25**
2	**Presentation skills** know your audience guidelines for an effective presentation-common flaws and overcoming them-body language and tips for giving presentation, Group discussion, Debate, telephone and email etiquettes	**12**	**25**
3	**skills** Essential corporate communication skills, Interpersonal Skills , Life management skills, Negotiation & Conflict management, Leadership skills, Teamwork	**11**	**25**
4	**Types of business meetings** Fundamentals of oral communication, Ethics in corporate communication, role of culture in national/international communication, persuasive communication	**11**	**25**
	Total	**44**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Analyze	Evaluate	Create
Weightage	25	25	25	25

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Confident Public Speaking: Develop the ability to speak confidently and persuasively in various public settings.
CO2	Effective Business Communication: Master skills for clear, concise, and impactful communication in corporate environments.
CO3	Presentation Skills: Create and deliver engaging and informative presentations for professional success.
CO4	Interpersonal Effectiveness: Enhance relationship-building, negotiation, and conflict resolution skills.
CO5	Crisis Communication: Learn to navigate and communicate effectively during challenging situations in the corporate world.

Reference Books

1.	**Corporate Governance (TextBook)** By Bob Tricker | Oxford.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 4**
Type of Course	Skill Enhancement Courses	
Prerequisite	Basic knowledge of Planning, organizing, staffing, directing, controlling.	
Course Objective	1. Planning: Setting objectives and creating a roadmap to achieve them. 2. Organizing: Structuring resources and tasks to meet goals efficiently. 3. Leading: Guiding and motivating employees to work towards common objectives. 4. Controlling: Monitoring progress and making necessary adjustments. 5. Decision-Making: Making informed choices to address challenges and opportunities.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	0	3	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Management and its various functions** Definition, nature, scope, and function of management, Different schools of Management Thoughts (Scientific Management by F.W.Taylor & 14 princi, Nature, Purpose / Significance, Types of planning, Steps in planning, planning premises, Decision Mak, Impediments in sound decision-making, steps in the decision-making process	**12**	**25**
2	**Organizing & Staffing: (Recruitment process)** Nature, importance, process, formal & informal organizations, Organi, Nature, importance, role & fun, Leadership, leadership styles	**11**	**25**
3	**Communication & Motivation** Concept, importance, process, types, Barriers, and breakdown of communication, Concept, designing of reward system, Maslow's theory, Meaning, importance, types of control, process, and control techniques.	**11**	**25**
4	**Functional Areas of management** Marketing management, Production management, Financial management	**11**	**25**
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Analyze	Evaluate	Create
Weightage	25	25	25	25

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Planning: Setting objectives and creating a roadmap to achieve them. .
CO2	Organizing: Structuring resources and tasks to meet goals efficiently.
CO3	Leading: Guiding and motivating employees to work towards common objectives.
CO4	Controlling: Monitoring progress and making necessary adjustments.
CO5	Decision-Making: Making informed choices to address challenges and opportunities.

Reference Books

1.	**Conflict Management and Organizational Efficiency (TextBook)** By Sanjeev Kumar

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Course	Bachelor of Technology (B.Tech.)	**Semester - 4**
Type of Course	Core Courses	
Prerequisite	03080101-T - PROGRAMMING IN C	
Course Objective	The goal of this course is to provide students with an understanding of basic concepts in the theory of computation. At the end of this course students will: understand key mechanisms in design of operating systems modules understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks compare performance of processor scheduling algorithms produce algorithmic solutions to process synchronization problems use modern operating system calls such as Linux process and synchronization libraries practice with operating system concepts such as process management, synchronization, networked processes and file systems	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction** What is an O.S, Evolution of OS, OS Services, Types Of OS: Batch Processing, Time Sharing, and Real-time Operating Systems, Concepts of OS, Different Views of OS, Processes and Communication, Manage Memory, brief introduction about the Linux and Unix Operating System, Input Output Management	**12**	**20**
2	**Process Management & Communication** Process, Process Control Block, Process States, Threads, Types of Threads, Multithreading, Classical IPC Problems, Reader's and writer Problem, Dinning Philosopher Problem, etc., Scheduling, Scheduling Algorithms, Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Strict Alternation, Peterson's Solution, The Producer-Consumer Problem, Semaphores, Event Counters, Monitor, Message Passing	**18**	**25**
3	**Deadlock** Deadlock Problem, Deadlock Characterization-Detection, recovery, avoidance, ignorance., Banker's algorithm for single & multiple resources, Deadlock Prevention	**12**	**20**
4	**Memory Management** Paging: Principle Of Operation, Page Allocation, H/W Support For Paging, Multiprogramming With Fixed partitions, Segmentation, Swapping, Virtual Memory: Concept, Performance Of Demand Paging, Page Replacement Algorithms, Thrashing, Locality	**10**	**20**
5	**Unix/Linux Operating System & File System**	**8**	**15**

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	Introduction to Unix and its file system, Introduction to Linux and its file structure, Some commands, Features and disadvantages		
	Total	**60**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy					
Level	Remembrance	Understanding	Application	Analyze	Evaluate
Weightage	20	30	15	15	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand critical mechanisms in the design of operating systems modules.
CO2	Understand process management, concurrent processes, and threads, memory management, virtual memory concepts, deadlocks
CO3	Compare the performance of processor scheduling algorithms
CO4	Analyze different IPC problems and their solutions.
CO5	Explain the difference between Linux and Windows Operating Systems.

Reference Books

1.	**Operating System by Tanenbaum (TextBook)** By Tanenbaum | Pearson publication

List of Practical

1.	Write a C program to implement the FCFS Scheduling Algorithm.
2.	Write a C program to implement the SJF Scheduling Algorithm.
3.	Write a C program to implement Priority Scheduling Algorithm.
4.	Write a C program to implement Round robin Scheduling Algorithm.
5.	Write a C program to implement First Fit Allocation Algorithm
6.	Write a C program to implement Best Fit Allocation Algorithm.
7.	Write a C program to implement Next Fit Allocation Algorithm.
8.	Write a C program to implement Worst Fit Allocation Algorithm.
9.	Perform any 10 basic Linux commands

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Course	Bachelor of Technology (B.Tech.)	**Semester - 4**
Type of Course	Core Courses	
Prerequisite	Basic Computer Hardware & software knowledge | 03060302-T - DIGITAL LOGIC DESIGN	
Course Objective	1. To understand the organization of a computer system in terms of its main components. 2. To understand internal structure and operation of digital computer. 3. To Understand the translation of assembly instructions into their binary representation.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	1	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Digital Logic Circuits, Digital Component and Data Representation** Digital Computers, Logic Gates, Boolean Algebra. Combinational circuits, Flip-flops, Sequential Circuits. Integrated Circuits, Decoders, Multiplexers, Registers, Shift Registers, Binary Counters, Memory units, and Number Systems.	**10**	**15**
2	**Overview of Register Transfer, Micro Operations, Basic Computer Organization and Design** Register Transfer and Register Transfer Language, Bus, and Memory transfer. Arithmetic Micro Operation, Logic Micro Operation, Shift Micro Operation, Arithmetic and Logic Shift Unit. Instruction Codes – Register, Instruction, Time, and Control. Instruction Cycle, Memory Reference Instruction, I/O and Interrupt, Design of Computer, Design of Accumulator Logic.	**15**	**20**
3	**Basic Computer Programming, Micro Programmed Control** Introduction, Machine Language, Assembly Language, the Assembler, Program Loops. Programming Arithmetic and Logic Operation, Subroutines, I/O–Programming. Control Memory; Address sequencing, Micro Program Example, Design of Control Unit**.**	**15**	**20**
4	**Central Processing Unit** Introduction to Central Processing Unit, General Register Organization, Stack. Organization Instruction Formats, Addressing Modes, Data Transfer, and Manipulation. Program Control, RICS, and CISC.	**10**	**25**
5	**Pipeline, Vector Processing** Parallel Processing; Pipelining-Arithmetic Pipelining, Instruction Pipelining, RISC Pipelining Vector Processing, Array Processor, Asynchronous Data Transfer, DMA, Priority Interrupt.	**10**	**20**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Analyze	Evaluate
Weightage	40	10	20	30

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Identify various parts Of the System's memory Hierarchy
CO2	Understand pipeline and Parallel Processing Techniques
CO3	Analysis of How Central Processing Works
CO4	Understand Numbering systems and conversion of numbering systems
CO5	Comprehend the features and performance parameters of different types of computer architectures.

Reference Books

1.	**Computer System Architecture (TextBook)** By M. Morris Mano | Pearson
2.	**Structured Computer Organization** By Andrew S. Tanenbaum and Todd Austin | PHI

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Course	Bachelor of Technology (B.Tech.)	**Semester - 4**
Type of Course	Core Courses	
Prerequisite	Basic front end related concepts | 03080101-T - PROGRAMMING IN C	
Course Objective	1. Learn how to design and develop a Web page using HTML and CSS. 2. Learn how to link pages so that they create a Web site. 3. Learn to apply CSS in a web page	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**A brief Introduction to the Internet** Computer Networks, Internet, URL (Uniform Resource Locator), Internet Service Provider, Intranet, Extranet, Virtual Private Network. Application of Internet: World Wide Web, Search Engines, News, groups, Electronic Mail, Web Portal, Chat, Video Conferencing, FTP, Remote Login, E-Commerce, E-Learning, E-Governance, E-Banking	**10**	**20**
2	**Basics of HTML** What is Internet Language? Understanding HTML, Creating a Web page, Linking to other Web Pages, Publishing HTML Pages, Text Alignment and Lists, Text Formatting Fonts Control, Email Links, and link within a Page	**10**	**20**
3	**Advance HTML** Creating a Table, Creating HTML Forms, Creating Web Page Graphics, Putting Graphics on a Web Page, Custom Backgrounds and Colors, and Creating Animated Graphics.	**15**	**25**
4	**Cascading Style Sheet** CSS, Defining Style with HTML Tags, Features of Style Sheet, Style Properties, Style Classes, External Style Sheet	**10**	**15**
5	**JavaScript** Introduction to JavaScript: Writing First Java Script, External JavaScript, Variables: Rules for variable names, Declaring the variable, Assign a value to a variable, Scope of variable, Using Operators, Control Statements, JavaScript loops, JavaScript Functions: Defining a Function, Returning a value from a function, User defines function.	**15**	**20**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	15	15	25	20	5	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand the basic networking and internet concepts
CO2	Understand the principle of basic world wide web
CO3	Use various HTML tags and advanced HTML to develop the user-friendly web pages
CO4	Use various CSS to develop user-friendly web pages and more attractive.
CO5	Use JavaScript to develop dynamic web pages.

Reference Books

1.	**10 minutes Guide to HTML Style Sheets (TextBook)** By Craig Zacker | PHI

List of Practical

1.	Write an HTML code to create a Home page having three links: About Us, Our Services and Contact Us.
2.	Write an HTML code to display your CV on a web page
3.	Write an HTML code to create E-commerce home page the usage of inline CSS.
4.	Write an HTML code to create bank home page the usage of Internal CSS.
5.	Write an HTML code to create IT Company home page the usage of External CSS.
6.	Create your mark sheet in HTML Code.
7.	Write a JavaScript program to subtract two numbers and display the difference
8.	Write a JavaScript program to add two numbers and display the sum in an alert box.
9.	Write a Javascript program to calculate multiplication and division of two numbers (input from the user) using 2 functions namely Multiply.
10.	Write a Javascript program to calculate multiplication and division of two numbers (input from the user) using 2 functions namely Division.
11.	Write a JavaScript program to division two numbers and display the difference
12.	Write a JavaScript program to multiplication two numbers and display the difference
13.	Write a JavaScript program to add two numbers and display the multiplication in an alert box.
14.	Write a JavaScript program to add two numbers and display the Division in an alert box.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 4**
Type of Course	Core Courses	
Prerequisite	Basic CSS and HTML concepts | 03080101-T - PROGRAMMING IN C	
Course Objective	1. Establishing Fundamental Java Programming Skills 2. Mastery of Object-Oriented Concepts in Java 3. Advanced Java Concepts: Inheritance, Polymorphism, Exception Handling, and GUI Programming	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Java** Basics of Java programming, Creating first Java classes. Features of Java, Adding comments to Java, Saving, compiling, and running a Java application. Creating a Java application using GUI output Data types, Variables, and Operators. Control structures including selection, Looping, Java methods, Overloading, and Math class. Arrays in Java, Advantages of Java, Applications of Java, Constants, Literals, variables, Keywords, Identifiers, numeric type conversion, Operators in Java. String handling functions and string buffer class.	**10**	**15**
2	**Methods, Object, Classes, Conditions & Loops in Java** Basics of objects and classes in Java. Constructors, Finalizer, Visibility modifiers, Methods, and objects. Inbuilt classes like String, Character, String Buffer, and File this reference. Method overloading, Constructors, Sending arguments to constructors, Constructors overloading. 'this' keyword, Static variable. Working with constants, if and if…..else, Nesting if… else, Using logical AND and OR operators, switch statements, Using the conditional AND not operators, Using the NOT operator, and Understanding precedence. While loop, for loop, do…. while loop.	**15**	**25**
3	**Inheritance and Polymorphism** Inheritance in Java, Super, and subclass. Overriding, Object class, Polymorphism, and Dynamic binding. Generic Programming, Casting objects, Instance of the operator, Abstract class, Interface in Java, Package in Java, Accessing superclass methods. Constructor calling during inheritance, Extending classes. Method overriding, Final method, Final superclass, Static method.	**10**	**25**
4	**Exception Handling** Learning about exceptions, Understanding the limitations of traditional error, and handling. Trying code and catching exceptions. Throwing and catching multiple exceptions. 'finally' block, Understanding the advantages of exception handling. Checked and unchecked exceptions, Creating own exceptions (custom exception).	**10**	**15**
5	**Multi-Threading & Applet**	**15**	**20**

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	Introduction, Thread Life Cycle. Creating and running thread (using Thread class and, Runnable interface).Thread Priorities. Thread join (), sleep () method, Thread synchronization. Exception handling with try-catch-finally, Collections in Java. Introduction to JavaBeans and Network Programming. Introduction of Applet, Lifecycle of an Applet, Comparing Applets and Application, Creating Applets. Parameters passing in the applet, Line, Rectangles, Ovals, Arcs, Polygons, and Polyline methods. Event handling in Java, Event types, Mouse, and key events. GUI Basics, Panels, Frames. Layout managers: Flow Layout, Border Layout, Grid Layout.GUI components like buttons, Checkboxes, Radio buttons, Labels, Text fields, Text areas, Combo boxes, Lists, Scroll bars, Sliders, Windows, Menus, and Dialog boxes.		
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Evaluate	Create
Weightage	25	25	10	10	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand fundamentals of Java programming.
CO2	Learn object-oriented programming, including inheritance and polymorphism.
CO3	Gain proficiency in exception handling and multithreading.
CO4	Explore inbuilt classes and libraries in Java.
CO5	Basic knowledge of advanced topics such as JavaBeans, network programming, and collections.

Reference Books

1.	**Object Oriented Programming in java (TextBook)** By Dr. G.T.Thampi | Dreamtech
2.	**Programming with Java** By E. Balagurusamy | Sixth Edition, Tata Mc Graw Hill

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List of Practical	
1.	Write a Program in JAVA that takes the input of the age of 3 people by the user and determines the oldest and youngest among them.
2.	Write a Program in JAVA to find positive or negative values using if else from the user input.
3.	Write a Program in JAVA to find out if a number is divisible by 5 and 7 using an if-else statement.
4.	Write a Program in JAVA to find out if a number is odd or even using user input.
5.	Write a Program in JAVA to find out profit or loss using user input.
6.	Write a Program in JAVA to check if a year is a leap year or not.
7.	Write a Program in JAVA to perform the calculator function using a switch case.
8.	Write a Program in JAVA that asks the user to enter marks of 5 subjects and print the corresponding grade using a switch case.
9.	Write a Program in JAVA to take 10 integers from the keyboard using a loop and print their average value on the screen.
10.	Write a Program in JAVA to Print 1 to 10 using a while loop.
11.	Write a Program in JAVA to Print 1 to 10 using the do while loop.
12.	Write a Program in JAVA to find out if the input number is Armstrong or not using a loop.
13.	Write a Program in JAVA to find out if the input number is Palindrome or not using a loop.
14.	Write a Program in JAVA to find 1st 10 out of the input number is Armstrong or not using a loop.
15.	Write a Program in JAVA to find out the 1st 10 Fibonacci series numbers using a loop.
16.	Write a Program in JAVA to find out the factorial of a given number using a loop.
17.	Write a Program in JAVA to find out whether a given number is prime or not using a loop.
18.	Write a Program in JAVA to print the below patterns using loops:
19.	Write a Program in JAVA to take input in a 1D Array & print it using a loop.
20.	Write a Program in JAVA to take input in a 2D Array & print it using a loop.
21.	Write a Program in JAVA to perform Single inheritance.
22.	Write a Program in JAVA to perform Multilevel inheritance.
23.	Write a Program in JAVA to perform Hierarchical inheritance.
24.	Write a Program in JAVA to perform Method Overloading.
25.	Write a Program in JAVA to perform Method Overriding.
26.	Write a Program in JAVA to perform how Abstraction Class & Abstraction Method work.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 5**
Type of Course	Core Courses	
Prerequisite	03070403-T - INTRODUCTION TO INTERNET AND HTML	
Course Objective	The purpose of this course is to be able to explain, configure, verify, and troubleshoot complex computer networks at an introductory level.	

Teaching Scheme (Contact Hours)				**Assessment**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SSE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Computer Network** Network History,Introduction of Network,Uses of computer network, Application of Network, Network hardware, Network software, Network Simulator, Network ,Differentiate various Line Configuration,use of Server, use of various types of server and their role,Types of Network, Internet, Intranet, Extranet,Protocols,Connection Oriented and Connection less service, Peer-Peer Network, Client -Server Network	**10**	**15**
2	**The Reference Model** OSI Model , TCP/IP Model, Comparision of TCP/IP and OSI ,Topology, types of topology, Design and thier implementaion ,Types of switching network,Circuit switching, Packet switching, Message switching,MAC address,Mobile telephone system,Line Configuration, Multiplexing ,Simple Duplex, Half Duplex, Full Duplex, Protocols- stop & Wait,Sliding Window	**15**	**20**
3	**Transmission Medias and IP address** Introduction of Transmission Medias- Twisted, Coaxial , Fiber optical cables,Radio waves, Infrared, Microwave,Laser,Use and application of medias, connectors, Ethernet cabling, Comparision of wired and wireless media,IP protocol, Subnet masking, Types of IP and classification, IP address scheme,IP V4, IP V6, IPV4 header,Routing and Routing Protocols,	**15**	**20**
4	**Network Devices and Flow Control** Network Devices Network devices and their types:Repeaters, Hubs, Switches, Router, Bridges,Brouter,Gateways, Comparision and use, LAN implementation and requirement **,**Flow Control, Flow Control techniques,Data Error and types, Error correction and detection techniques, Hamming code,Hamming distance	**10**	**20**
5	**The Application Layer** DNS,DNS name space, Resource records, Name servers,URL, Electronic mail,Mail protocols, Email architecture and services, User agent, Message formats, Message transfer, Final delivery, World Wide Web Architectural overview,File Transfer Protocol and Trival File Transfer Protocol, HTTP,HTTPS,Network Security, Firewall,Types of Firewall,TCP,UDP,Network commands	**10**	**25**
	Total	**60**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy					
Level	Remembrance	Understanding	Application	Evaluate	Create
Weightage	20	15	20	20	25

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Describe the components and infrastructure that form the basis for most computer networks
CO2	Describe the technical aspects of Computer Network on the Internet.
CO3	Understand the use of various Network components and Transmission Media.
CO4	Understand routing strategies for an IP based networking infrastructure.
CO5	Configure Different topologies in Cisco Packet tracer

Reference Books

1.	**Computer Network** By Andrew S. Tanenbaum | Pearson
2.	**Introduction to Data Communication and Networking (TextBook)** By Behrouz Forouzan | TMH

List of Practical

1.	Write down basic Networking commands.
2.	Configure Line (Bus) Topology in Cisco Packet Tracer.
3.	Configure Ring Topology in Cisco Packet Tracer.
4.	Configure Star Topology in Cisco Packet Tracer.
5.	Configure Mesh Topology in Cisco Packet Tracer.
6.	Configure Tree Topology in Cisco Packet Tracer.
7.	Configure Hybrid Topology in Cisco Packet Tracer.
8.	Write down steps to configure Local Area Network.
9.	Give Classification of Transmission Medias with diagram.
10.	Give IP address Classification.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 5**
Type of Course	Core Courses	
Prerequisite	Project Management skills | 03070603-T - OBJECT ORIENTED ANALYSIS AND DESIGN WITH UML	
Course Objective	1. To assist the student in understanding the basic theory of software engineering 2. To apply these basic theoretical principles to a group software development project	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	1	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**INTRODUCTION** Definition, Programs v/s Software products, Software, Changing nature of software, Software Myths, Emergence of SE, Changes in Software development, Computer system engineering, Layered technology, Process Framework, CMMI, Personnel and team process models, software reliability, software quality, ISO9000 Certification	**15**	**25**
2	**SOFTWARE MODELS , PROJECT MANAGEMENT** Use of life cycle model, Process models, Comparison of models, Responsibility of project manager, Skills needed for SPM, Project Planning, SPMP Document, Project size estimation-LOC, FPM. Project estimation techniques-empirical, heuristic and analytical techniques. Scheduling- Ghant chart and Pert Chart, Staffing, Risk Management- identification, assessment, containment	**15**	**25**
3	**REQUIREMENT ANALYSIS AND SPECIFICATION** Goal of requirement and specification, Phases, Requirement engineering tasks, Software Requirement Specification(SRS), Characteristics of good & bad SRS document, Formal Techniques	**10**	**15**
4	**DATA ORIENTED ANALYSIS AND DESIGN** Difference between Data and Information, E-R Diagram, Control and Process Specification, Data Dictionary, Objective, What is good software design, Cohesion and Coupling, Software design approaches and d/b them, Structured Analysis, DFD's and its symbols, Structures design, Flowchart v/s Structure chart, Transformation of DFD model into Structured Chart—transform and transaction, Design Review, Design process, quality and guidelines, Design CONCEPTS, Design model- structure, behavior and architectural	**10**	**20**
5	**TESTING** Concepts, Psychology of testing, Levels of testing, White-Box testing, Black-box testing	**10**	**15**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze
Weightage	30	30	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand Software Devlopment Life Cycle and its importance
CO2	Develop some basic level of software architecture
CO3	Understanding the concept and Importance of Software Project Management.
CO4	List and Diffrerentiate between Various Testing Technique.
CO5	Compare different Software Devlopment Process Models

Reference Books

1.	**Software Engineering : A Practitioner's Approach (TextBook)** By Roger S. Pressman | McGraw-Hill
2.	**Fundamentals of Software Engineering** By Rajib Mall | PHI

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Course	Bachelor of Technology (B.Tech.)	**Semester - 5**
Type of Course	Core Courses	
Prerequisite	03070402-T - COMPUTER ORGANIZATION AND ARCHITECTURE	
Course Objective	1. Easily explanation of different types of server. 2. We can get basic and depth knowledge for IIS role and implementations in server.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** – Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Windows Server 2012** Web Basics and Fundamentals, Web Servers and Meaning, role, Different types of Web Servers and types of server Difference between different servers Application Server and their role, Installation of IIS , Modules in IIS, IIS Architecture.	**10**	**15**
2	**Application and port services** WWW service, Properties, Directory Level Properties, File Level Application Pool , Configuring FTP service, Authentication, Installing SMTP Server.	**15**	**20**
3	**Security in IIS** Virtual Server, Virtualization, SMTP Server Access, SMTP Domains, Security Issues, Securing website, Group policies Security Policy in 2012 Server.	**15**	**25**
4	**Hyper –V & their services** Installation of different server in windows server 2012, managing services ,creating and configuring Hyper-v **,**VLAN,	**10**	**20**
5	**Understanding the of DNS, IPV4 & IPV6** Understanding the TCP/IP Model, DNS etc. Configuring IPv4, Using Host File, Installing DNS, Zones, Forward Zones, DHCP Creating & configuring security certificate in windows server 2012.	**10**	**20**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Application	Analyze	Create
Weightage	15	25	30	30

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understanding of IIS ,different web server and protocols.
CO2	Basic knowledge of installation & configuration of application & port services
CO3	Use of ADDS, Virtual machine & different policies, security issues in server.

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CO4	Basic knowledge of configuration & installation, of Hyper-v & Vlan and different server in windows server 2012
CO5	Apply different policies and understand thier role using IIS

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Reference Books	
1.	**IIS 6: The Complete Reference** By Hethe Henrickson and Scott Hofmann | TMG
2.	**IIS6 Resource Kit (TextBook)** By MS Press
3.	**Microsoft Windows Server 2008: The Complete Reference (TextBook)** By Danielle Ruest & Nelson Ruest | McGraw-Hill/Osborne Media (2008)

List of Practical	
1.	Installation of Windows Server 2012.
2.	IIS installation in Windows Server 2012.
3.	Different roles of IIS and use.
4.	Installation of ADDS in IIS.
5.	Setting up DNS forward zones, reverse zones, querying DNS.
6.	URL configuration of website
7.	Crate GPO and use different Policies in IIS.
8.	Hyper-V installation
9.	SMTP server installation.
10.	VLAN configuration

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Course	Bachelor of Technology (B.Tech.)	**Semester - 5**
Type of Course	Core Courses	
Prerequisite	03070403-T - INTRODUCTION TO INTERNET AND HTML	
Course Objective	1. To develop skills needed for building interactive, data-driven sites 2. To learn object oriented concepts with PHP 3. To learn effective usage of cookies and sessions	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Introduction To PHP, Building blocks of PHP, Working With Arrays, Working with Strings And Date and Time Functions, Working with Forms** Basic syntax, Variables, Data Types, Operators and expressions, Constants. Flow Control: Switch flow, Loops, Code Block, Sending data to the browser. Arrays, Creating array, Array related Functions. Working with Function: Function, Calling Function, Defining Function, Returning the Values from user defined function, Variable Scope, Argument. formatting String with PHP, Date and Time Function, String Manipulation and Investigating Strings with PHP. Creating form, Handling form, Validating form data, Accessing form data, use of Hidden fields to save State, Redirecting user, file Upload and Sending Mail on Form Submission.	**15**	**25**
2	**Introduction to MySQL & Interacting with MySQL, Understanding the Database Design , Using MySQL with PHP** The importance of good database design, Types of Table Relationship, Understanding Normalization. Learning Basic SQL Command: Table Creation, Insert row, Select Command Using Where Clause, Update and Delete Command, Replace Command, String Function, Date and Time Functions, Stored Procedures, Join, Indexing and Sorting query. connecting to MySQL and selecting the database, executing simple queries, retrieving query results, counting return Records, updating, Record Addition, Viewing Record, and Deletion Record with PHP	**15**	**25**
3	**Introduction to Cookies & working With Files and Directories ,Working with files ,Working with Cookies and User Session** Include Files with INCLUDE, creating and deleting files, opening a file for reading, writing or Appending, Reading from files, Validating Files. Working with Directories: Open Pipes to and from Process using Popen(), Running command with Exec(), Running Command with System() or Passthrough(). Introduction of Cookie, Setting a Cookie with PHP, Introduction of Session, Improving Session Security, Starting a Session, Working with Session Variables, Passing Session Id in the query String, Destroying Session and Unsetting Variables.	**10**	**15**
4	**Introduction to Object Oriented Programming With PHP and Error Handling** Introduction, the basic, auto loading objects, Class, Extends, Constructs, Scope Resolution Operator, Parent, serializing object, The magic objects – sleep and awake, reference inside the constructor, comparing objects. Visibility, overloading, object interface, pattern, magic method, reflection, extending exception. Error Handling and Debugging: General error types and debugging, displaying PHP errors, Adjusting Error Reporting, Creating Custom error handler, PHP debugging techniques, SQL and MySQL debugging techniques.	**10**	**20**
5	**Introduction to Joomla** Introduction to Joomla including 1.0,1.5 and 1.6, Site -wide settings and user management, Setting up and organizing menus and navigation, Managing content articles, Working with Joomla components, Using Joomla modules and plugins, Choosing and configuring Joomla templates	**10**	**15**

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Total	**60**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy					
Level	Remembrance	Understanding	Application	Analyze	Create
Weightage	10	20	25	30	15

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand the basic networking and internet concepts
CO3	Use various HTML tags and advance html to develop the user friendly web pages
CO4	Use various CSS to develop the user friendly web pages and more attractive.
CO5	Use the JavaScript to develop the dynamic web pages.

Reference Books

1.	**PHP MySQL and Apache, SAMS Teach Yourself (TextBook)** By Julie C. Meloni | SAMS

List of Practical

1.	Write a Program to print “Hello World”.
2.	Write a program to concatenate two strings.
3.	Write a program to add two integer numbers.
4.	Write a program to swap two numbers.
5.	Write a program to find the area and perimeter of a circle.
6.	Write a program to print bio when name is echoed.
7.	Write a program to print birth date and time.
8.	Write a program to print the date in different formats.
9.	Write a program to print current time zone.
10.	Write a program to accept the details from a form and show it into different page.
11.	Write a program to accept the details from a form and show it into same page.
12.	Create a form and use different validators.
13.	Write a program to check the eligibility of voting in India.
14.	`Write a program to connect php to MySql and show the message “Connection Established”.
15.	Write a program to demonstrate Cookie

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Course	Bachelor of Technology (B.Tech.)	**Semester - 5**
Type of Course	Core Courses	
Prerequisite	03080401-T - OBJECT ORIENTED PROGRAMING WITH JAVA	
Course Objective	1. Develop a web-based application using Servlets & JSPs. 2. Develop web applications using the Struts framework. 3. Skill to use a pre-built framework for rapid application development.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to J2EE** Introduction to advances java technologies, MVC Architecture, Java GUI components, Swing, AWT, Look and Feel. **Basic swing components** Text Fields, Buttons, Toggle Buttons, Checkboxes.	**15**	**25**
2	**Java Database Programming &RMI** Java database Programming.java.sql Package, JDBC driver types, java beans, RMI Architecture, Designing RMI application, Executing RMI application.	**10**	**15**
3	**Java Servlet** Server-side programming with Java Servlet, HTTP and Servlet, Servlet API, Life cycle, configuration and context, Request and Response objects, Session handling, and event handling, Introduction to filters with writing simple filter application.	**15**	**25**
4	**Java Server Pages** JSP architecture, JSP page life cycle, JSP elements, Expression Language, Tag Extensions, Tag Extension API, Tag handlers, and JSP Fragments. Tag Files, JSTL, Core Tag library, Overview of XML Tag library, SQL Tag library, and Functions Tag library.	**10**	**20**
5	**Struts2** Introduction to the Apache Struts. MVC Architecture, Struts Architecture, How Struts Works, Introduction to the Struts Controller, Introduction to the Struts Action Class, Using Struts Action From Class, Using Struts HTML Tags, Introduction to Struts, Validator Framework Client Side Address Validation in Struts, Custom Validators Example, Developing Application with Struts Tiles.	**10**	**15**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	25	25	10	10	10	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	Explain MVC architecture, GUI components, Java database programming, RMI, Servlet and Java Server pages.
CO2	Analyze how to work with swing component, Database connectivity, server side programming with java and JSP.
CO3	Design web based application using java server pages and database programming.
CO4	Conduct experiments of database programming using Java Database Connectivity (JDBC) API
CO5	Prepare small application through java swing components.

Reference Books	
1.	**Black Book " Java server programming" J2EE** By Kathy walrath | 1st ed., Dream Tech Publishers
2.	**Complete Reference J2EE** By James Keogh | mcgraw publication
3.	**Java EE 5 for beginners (TextBook)** By Bayross and Shah | SPD

List of Practical	
1.	Create Servlet file which contains following functions: 1.Connect 2. Create Database 3. Create Table 4. Insert Records into respective table 5. Update records of particular table of database 6. Delete Records from table. 7. Delete table and also database.
2.	User can create a new database and also create new table under that database. Once database has been created then user can perform database operation by calling above functions. Use following Java Statement interface to implement program: 1.Statement 2. Prepared statement 3. Callable statement
3.	`Create Servlet file and study web descriptor file.
4.	Create login form and perform state management using Cookies, Http Session and URL Rewriting.
5.	Implement Authentication filter using filter API.
6.	Write RMI application where client supplies two numbers and server response by summing it. Provide your custom security policy for this application.
7.	Implement Student information system using JDBC and RMI.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 5**
Type of Course	Core Courses	
Prerequisite	03070402-T - COMPUTER ORGANIZATION AND ARCHITECTURE	
Course Objective	To introduce architecture and operation of typical microprocessors and microcontrollers. To familiarize the programming and interfacing of microprocessors and microcontrollers. To provide strong foundation for designing real world applications using microprocessors and microcontrollers.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Microprocessors** General definitions of microcomputers, microprocessors, Microcontrollers and digital signal processors. Evolution of microprocessors. Register structure, ALU. Bus Organization, Timing and Control of microprocessor	**10**	**15**
2	**8085 Microprocessor** 8085 Architecture and its operation, Signal descriptions and pins of 8085 microprocessor. Memory interfacing, Assembly Language Programming of 8085: Programming model. Addressing modes, Instruction set, Arithmetic and Logic operations.	**15**	**25**
3	**8086 Microprocessor** Internal organization of 8086 microprocessor. Signal descriptions And pins of 8086 microprocessor. Physical memory organization, Minimum mode 8086 System and timings. Maximum mode 8086 system and timing, Assembly Language of 8086. Description of Instructions, Assembly directives. Assembly software programs with algorithms	**15**	**20**
4	**Special Architectural Features** Programming: Stack structure, Interrupts and Interrupt service routine. Interrupt programming, Macros, Timings and Delays, interfacing with 8086. Interfacing with peripheral ICs like 8255, 8254, 8279, 8259 etc. Interfacing with LEDs, LCDs. Interfacing ADCs, and DACs etc.	**10**	**20**
5	**Introduction to Microcontroller** 8051 Microcontrollers: Microcontrollers and embedded processors. Overview of the 8051 family: The program counter in the 8051, 8051 data types and directives, 8051 flag bits and the PSW register, 8051 register banks and stack.	**10**	**20**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	20	20	10	20	10	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	Understanding the architecture and Operation of Microprocessor and Microcontoller
CO2	Understand various Types of Memory Use in MicroProcessors
CO3	Solve Assembly language Programme For Microprocessor Using Various Addressing Modes.
CO4	Analyze the Performance and limitations of Microprocessors.
CO5	Understand and realize the Interfacing of memory & various I/O devices with 8085 microprocessor

Reference Books	
1.	**Microprocessor Architecture, Programming, and application with 8085, (TextBook)** By Ramesh Gaonkar | Penram International Publication
2.	**Microprocessor x86 programming** By K. R. Venugopal & Rajkumar | BPB Publication
3.	**The 8080/85 Family: Design, Programming & Interfacing** By John Ufferbeck | PHI India

List of Practical	
1.	Write a program to addition two 8-bit number using 8085
2.	Write a program to subtract two 8-bit number using 8085
3.	Write a program to Addition two 16-bit number using 8085
4.	Write a program to subtract two 16-bit number using 8085
5.	Write a program to addition of two digit using memory location 8085
6.	Write a program to addition of two 16-bit number using 8086 microprocessor
7.	Write a program to subtract two 16-bit number using 8086 microprocessor
8.	To demonstrate the interfacing of 8279 Display and keyboard controller

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Course	Bachelor of Technology (B.Tech.)	**Semester - 6**
Type of Course	Core Courses	
Prerequisite	03000301-T - MATHEMATICS-III	
Course Objective	1. To introduce the different Graphic components and Primitives. 2. To develop an understanding of 2D and 3D Transformations.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Computer Graphics , Display Technologies and Graphics Hardware.** Computer Graphics and its Applications, Graphics generation process and its terminologies. Input and Output Devices, Raster scan and Random Scan, Graphics mode, Display Adapter Card.	**10**	**20**
2	**Graphic Primitives.** 2-D Graphics Primitives: DDA and Bresenham Line Drawing Algorithm , Mid Point Circle Drawing Algorithm, Ellipse, Polygon filling algorithms, Filling with different patterns, Character generation, Aliasing and Anti-Aliasing, Jaggies.	**15**	**20**
3	**Transformations, Basic Transformations and Composite ,Transformations Other transformations** 2-D Transformation, Homogeneous Coordinate Transformation System. Translation, Rotation and Scaling, Pivot point Rotation, Fixed Point Scaling. Reflection and Shear.	**10**	**20**
4	**Clipping Algorithm** Windowing and Clipping Basics, Line Clipping Algorithm: Cohen-Sutherland Polygon Clipping Algorithm: Sutherland Hodgeman Polygon Clipping Algorithm**,** Window to view-port transformation.	**10**	**20**
5	**Curves, Surfaces and 3D Graphics** Spline Curve, Introduction to Interpolation and Approximation Curve, Bezier Curve, Properties and Application of Bezier Curve. 3-D Viewing and Transformation: Representation of 3-D object in form of polygon mesh, curve and surfaces, 3-D geometrical transformation, parallel and perspective projection, Color Models: RGB, YIQ, CMY.	**10**	**20**
	Total	**55**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	25	25	10	10	10	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	Understand the basics of computer graphics, different graphics system and applications of computer graphics.
CO2	Understand various algorithms for scan conversion and filling of basic objects and their comparative analysis.
CO3	Use of geometric transformations on graphics objects and their application in composite form.
CO4	Extract scene with different clipping methods and its transformation to graphics display device.
CO5	Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.

Reference Books	
1.	**Computer Graphics (TextBook)** By Donald Hearn and M.Pauline Baker | Donald Hearn and M. Pauline Baker

List of Practical	
1.	Write a program to perform basic graphics and shapes creation using inbuilt methods
2.	Write a program to perform DDA Line drawing algorithm
3.	Write a program to perform Bresenham's Line drawing Algorithm
4.	Write a program to perform Mid-Point Circle generation
5.	Write a program to perform Flood fill algorithm
6.	Write a program to perform Boundary fill algorithm
7.	Write a program to perform Transformations in 2D : Translate
8.	Write a program to perform Transformations in 2D : Rotate
9.	Write a program to perform Transformations in 2D : Scalling
10.	Write a program to perform Line clipping

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Course	Bachelor of Technology (B.Tech.)	**Semester - 6**
Type of Course	Core Courses	
Prerequisite	03070501-T - COMPUTER NETWORK	
Course Objective	1. To provide an introduction to the fundamental principles of cryptography and network security. 2. To study various Encryption techniques. 3. To illustrate how to prevent, detect, and mitigate security threats against the network.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to cryptography and Network Security** Roadmap, Introduction to security, Security Trends, OSI security Architecture ,Security Attacks, Security services Security Mechanisms, A model for network Security, Security Attack and Security Threat, Malicious Software Hacking, Cryptography, Digital Signature, Firewall and its types, User identification and authentication, Other security measures	**10**	**15**
2	**Encryption Techniques** Symmetric Cipher model, Substitution Techniques, Transposition Techniques Steganography Block Cipher Principles, DES (Data Encryption Standard), Strength of DES, Block Cipher design principles. AES (Advance Encryption Standard), Origin, Evaluation, AES Cipher More on Symmetric ciphers- Block cipher mode of operation.	**15**	**20**
3	**Public Key Cryptography and RSA** Principles of public key cryptosystems, Applications for public key Cryptosystems, RSA Algorithm, Security of RSA, Key Management- Distribution of Public keys, Distribution of secret keys using public key cryptography, Diffie-Hellman Key Exchange	**15**	**20**
4	**Message Authentication And Hash Function** Authentication Requirements, Authentication Functions, MAC (Message Authentication Codes), Hash Functions, Birthday attacks, Secure Hash Algorithm (SHA).	**10**	**20**
5	**Electronic Mail Security –Network Security** PGP and its operation, S/MIME, MIME and its Functionality IP Security, Applications, Architecture, Services, Security Association AH,ESP, Web security threats, SSL and SET, FIREWALL and its types	**10**	**25**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	15	15	15	15	25	15

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand different security models and attacks
CO2	Enable the students to learn fundamental concepts of computer security and cryptography and utilize these techniques in computing systems.
CO3	Understand management issues and algorithm
CO4	Understand different security issues and their types
CO5	Evaluate different encryption techniques of cryptography

Reference Books

1.	**Cryptography and Network Security (TextBook)** By William Stalling | Pearson

List of Practical

1.	Write a program to perform Caesar Cipher.
2.	Write a program to perform Mono alphabetic Cipher.
3.	Write a program to perform Playfair Cipher.
4.	Write a program to perform Polyalphabetic Cipher.
5.	Write a program to perform One Time Pad Cipher.
6.	Draw Feistel Cipher Structure.
7.	Draw Data Encryption Standard Structure.
8.	Draw Advance Encryption Standard Structure.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 6**
Type of Course	Core Courses	
Prerequisite	03070501-T - COMPUTER NETWORK	
Course Objective	1. Be able to Configure and maintain the organization's internal computer network. 2. Manage network security tools, e.g., firewall, anti-virus and intrusion detection systems. 3. Implement and maintain emergency backup and restore systems for mission-critical network servers	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Internet Working & IP Subnetting** Internetworking basics, OSI Layer, Half Duplex, Full Duplex, Ethernet, Cabling, TCP/IP Model: TCP protocols, IP Addressing, Private IP Addressing, NAT, Sub netting Basics, How to create Subnets, CIDR Classes Inter-domain, Routing, Classes of Addresses	**10**	**15**
2	**Intro to CISCO-IOS & IP Routing** Cisco Router User Interface, Connecting to a Router, Setup Model, Command Line Interface, CLI Prompts, Setting Passwords, Banners, Hostnames, Router Interfaces, Viewing and Saving Configurations. (Commands in lab hours) IP Routing in Larger Networks, Types of Routing, Static, Dynamic and Default Routing, Administrative Distances, Routing Loops, Maximum Hop Count, Route Poisoning, Hold downs	**15**	**20**
3	**Routing Protocols** RIP: Timers, Configuring, Verifying RIP,IGRP: Meaning Configuration, Difference between RIP and IGRP. Debugging Commands, EIGRP: Protocol, Features, Neighbor Discovery, RTP, DUA. Multiple AS. OSPF: Basics, Terminology, SPF Tree Calculation.	**15**	**25**
4	**Layer2 Switching VLANS & Access list** Meaning, Devices, STP, LAN Types, 1900, 2950,Switches,Basic commands, Vlan Basics, Membership, Frame Tagging, VLAN Trunking Protocol, Intro to Access List, Standard Access List, Telnet Access, Extended Access List, Named Access list.	**10**	**20**
5	**Wide Area Networking Protocols & Introduction to frame Relay** Intro to WAN, WAN Terms, Cabling WAN, Serial, Transmission, Data Terminal Equipment, Point to Point Protocol, Meaning and Importance. Application demonstration through Simulator.	**10**	**20**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Evaluate	Create
Weightage	15	15	25	25	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Be able to Configure and maintain the organization's internal computer network.
CO2	Manage network security tools, e.g., firewall, anti-virus etc.
CO3	Monitor network performance and configure network hardware, for example, Cisco routers and switches.
CO4	Implement and maintain emergency backup and restore systems for mission-critical network servers.
CO5	Configure different routing protocol in simulator

Reference Books

1.	**Computer Networks (TextBook)** By Andrew S Tannenbaum | Pearson Publication

List of Practical

1.	Understanding Modes: Standard Mode, Advance Mode
2.	CLI Prompt & execution of basic commands
3.	Setting up Lab for default routing
4.	Setting up lab for RIP
5.	Setting up lab for IGRP
6.	Configure RIP version
7.	Setting up lab for EIGRP
8.	Setting up lab for OSPF
9.	Setting up VLAN• Creating and managing permissions through Access List

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Course	Bachelor of Technology (B.Tech.)	**Semester - 6**
Type of Course	Core Courses	
Prerequisite	03070302-T - DATABASE MANAGEMENT SYSTEM	
Course Objective	1. To understand the basic concepts of Path testing, Logic based testing 2. To implement Data flow testing, domain testing	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	1	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** – Weightage

Sr.	**Topics**	**T**	**W**
1	**INTRODUCTION TO DATA WAREHOUSING** Introduction – What is Data Warehousing - Data Warehousing concepts, Data Warehousing building blocks : Defining features – Data Warehouse and Data Marts, Issues in Data Warehousing -Benefits of Data Warehousing, Overview of Components, Metadata : Use of metadata in Data Warehouse, Categories of Metadata – Roles of Metadata, Architecture of Data Warehouse, Data Warehouse models, Methodology for Data Warehousing	**15**	**25**
2	**DATA DESIGN AND DATA PREPARATION** ETL Process overview, Data Extraction, Data Transformation, Data Loading, Data Quality, Challenges, ETL Tools, OLAP in Data Warehouse, Features and operations of OLAP – (Drill-down, Rollup, Slice, Dice), OLAP schema design OLAP Models	**15**	**25**
3	**INTRODUCTION TO DATA MINING** Motivation for Data Mining, Data Mining: On What kind of Data?, Definition and Functionalities: What kind of patterns can be mined?, Issues in DM, KDD Process, Classification of Data Mining Systems	**10**	**15**
4	**DATA PREPROCESSING** Why Preprocess the Data?, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation, Data Mining Primitives: What Defines a Data Mining Task	**10**	**20**
5	**CONCEPT DISCRIPTION AND ASSOCIATION RULE MINING** What is concept description?, Association Rule Mining: Market basket analysis, Basic concepts, Finding frequent item sets: Apriori algorithm, generating rules, Improved Apriori algorithm, Frequent pattern growth algorithm	**10**	**15**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	30	30	10	10	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	Understand the functionality of the various data mining and data warehousing component
CO2	Appreciate the strengths and limitations of various data mining and data warehousing models
CO3	Explain the techniques of various data using OLAP Cube
CO4	Describe different methodologies used in data mining and data ware housing.
CO5	Compare different approaches of data ware housing and data mining with various technologies

Reference Books	
1.	**Data Mining Concepts and Techniques (TextBook)** By Jiawei Han, Micheline Kamber, Jian Pei. | ELSEVIER

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Course	Bachelor of Technology (B.Tech.)	**Semester - 6**
Type of Course	Core Courses	
Prerequisite	03080301-T - OBJECT ORIENTED PROGRAMMING WITH C++	
Course Objective	To enable the students to 1. To learn about basic features of ASP.NET and its controls 2. To create an ASP.NET application using standard .NET Controls 3. To learn about connecting data sources using ADO.NET and managing them.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to .NET Framework and ASP.NET** State the Components of Framework and describe CLR : Microsoft .NET Framework overview, NET Framework Architecture,.NET Framework Components (CLR, CLS,CTS,MSIL,Namespace,JIT,Metadata), Explain benefits of ASP over classic ASP, The client- Server architecture, Develop applications using ASP.NET IDE ASP.NET(WEB FORMS) - Develop Simple web page using built in objects : Types of ASP.NET Files, Page Life Cycle	**10**	**17**
2	**ASP.NET Controls and Validations, Use controls available with IDE platform of ASP.NET , Validation Controls** Button, Checkbox, Check box List**,** Radio button, Radio Button list**,** Drop down List, Hyperlink ,Image, Image Button,Label,Link Button, List Box, List Item,Panel,Text Box**.** Required field validation, Range Validation**,** Regular Expression, Custom Validation, Validation Summary	**15**	**25**
3	**Styles, Themes and Master Pages** Creating Style sheet, applying style sheet rules, Themes, Basics of Master Page, How master page and content pages are connected, Nesting Master page	**10**	**16**
4	**ASP.NET State Management** State Management : Client Side state management Technique and Server Side Management technique, View State, The Query String, Cookies, Session State, Application State, The Global.asax application files , ASP.NET Configuration files	**10**	**17**
5	**Connecting Database Using ADO.NET , ADO.NET Architecture., SQL Data Source** Data provider, Connection Object , Command Object , DataReader Object , DataAdapter Object, Grid View, Dataset, Data View, Data Binding Select, Update , Deleting Records	**15**	**25**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	10	20	20	20	10	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes

At the end of this course, students will be able to:	
CO1	Explain ASP.net framework, state management, master page concept, database connectivity.
CO2	Analyze how to work with asp.net web forms, controls and validations.
CO3	Design web based application with different controls and security features.
CO4	Conduct experiments of database programming using ADO.NET.
CO5	Prepare small application through master page concept of .Net framework.

Reference Books

1.	**ASP.NET Complete Reference** By Matthew Macdonald and Robert Standefer | TMH
2.	**Professional C#.Net (TextBook)** By Christian Nagel | Wrox Publication

List of Practical

1.	Write a program that displays a textbox, a button and a label. Display the entered text of textbox to label after clicking on button.
2.	Develop a simple calculator with two boxes, and four buttons for addition, subtraction, multiplication and division and the output of the program displays in a label.
3.	Set the font-Arial, font style-bold , font size-18px of different controls(ie. Label, textbox, button) using css.
4.	Create the application that accepts name, password, age, email id, and user id. All the information entry is compulsory. Password should be reconfirmed. Age should be within 21 to 30. Email id should be valid. User id should have at least a capital letter and digit as well as length should be between 7 and 20 characters.
5.	Create home page of your website using master page concept.
6.	Why web applications are stateless? Explain with example.
7.	Create a web page with “Hit Count” button. The count must be increased whenever mouse clicks by using Hidden Field.
8.	Create a web page with “Hit Count” button. The count must be increased whenever mouse clicks by using View State.
9.	Develop a web page to implement the concept of Query String.
10.	Create a Web App to display all the Empname and Deptid of the employee from the database using SQL source control and bind it to GridView. Database fields are(DeptId, DeptName, EmpName, Salary).
11.	Write an application which implements the use of Theme and Skin.
12.	Create a form which contains UID, Name, Branch and Semester. Insert the values into a database table.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 6**
Type of Course	Core Courses	
Prerequisite	03080301-T - OBJECT ORIENTED PROGRAMMING WITH C++	
Course Objective	Its main objective is to teach the basic concepts and techniques which form the object-oriented programming paradigm.	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**Lab**	**Total Marks**
3	0	1	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** – Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Object Oriented Analysis and Design** Object Oriented Fundamental. Objects, Classes. Object oriented design process. Importance of modeling. Principles of modeling. Object oriented modeling concepts, Analysis & Design	**15**	**25**
2	**Introduction to UML** Concept of UML.Basic building blocks of UML.Mechanism in UML.Architecture.SDLC in UML	**15**	**20**
3	**Structural Modeling** Notations.Terminology.Relationships.Common Mechanisms.Examples.Diagrams – “Class Diagram, Object Diagram, Package Diagram, Composite Structure Diagram, Sequence Diagram.”	**10**	**20**
4	**Behavior Modeling** Notations.Terminology.Relationships.Common Mechanism.Examples.Diagrams – “Activity Diagram, Interaction Diagram, Use case Diagram”.	**10**	**15**
5	**Architectural Modeling** Notations.Terminology.Relationships.Common Mechanism. Examples Diagrams – “Component Diagram, Deployment Diagram.”	**10**	**20**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	30	20	20	10	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Summarize The Key Concept Principle Of Object Oriented Analysis And Design
CO2	Apply Structure Modelling Techniques To Visually Represent And Interaction Between Object In System.
CO3	Produced Detailed UML Diagrams To Model System And Behaviour Structure

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CO4	Student Will Able To Create Object Oriented Modules And Diagrams To Represent Complex System
CO5	Prepare Case study on any topic and implement different diagrams.

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Reference Books	
1.	**Object Oriented Modeling and Design with UML (TextBook)** By Michael Blaha and James Rumbaugh | Pearson

List of Practical	
1.	To develop a problem statement
2.	Develop an IEEE standard SRS document. Also develop risk management and project plan (Gantt chart).
3.	Identify Use Cases and develop the Use Case model.
4.	Identify the business activities and develop an UML Activity diagram.
5.	Identity the conceptual classes and develop a domain model with UML Class diagram.
6.	Using the identified scenarios find the interaction between objects and represent them using UML Interaction diagrams.
7.	Draw the State Chart diagram.
8.	. Identify the User Interface, Domain objects, and Technical services. Draw the partial layered, logical architecture diagram with UML package diagram notation.
9.	Implement the Technical services layer.
10.	Implement the Domain objects layer.
11.	Implement the User Interface layer
12.	Draw Component and Deployment diagrams.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 7**
Type of Course	Core Courses	
Prerequisite	13990402-T - JAVA PROGRAMMING	
Course Objective	1. Describe mobile device components. 2. Create a simple User Interface using Android emulator. 3. Unit Test an Android application	

Teaching Scheme (Contact Hours)				**Assessment Scheme**			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Introduction to Android** History of Mobile Software Development, The Open Handset Alliance, The Android Platform, Android SDK, Building a sample Android application.	15	25
2	**Android Application Design Essentials** Anatomy of Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy.	10	15
3	**Android User Interface Design Essentials** User Interface Screen Elements. Designing User Interfaces with Layouts. Drawing and Working with Animation.	15	25
4	**Using Common Android APIs** Using Android Data and Storage APIs.Managing data using SQLite. Sharing Data between Applications with Content Providers. Using Android Networking APIs.Using Android Web APIs.Using Android Telephony APIs.	10	20
5	**Deploying Android Application to the World** Selling your Android application.	10	15
	Total	60	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	25	25	20	10	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	How to build a sample Android application using different types of Design Essentials.
CO2	Design the User Interfaces with Layouts and Working with Animation.
CO3	Use the Android API to manage data using SQLite.
CO4	Developing a proper Android Application with can be used as a real-world application.
CO5	Test application and run in different environment

Reference Books	
1.	**Beginning Android (TextBook)** By Mark L Murphy | Wiley India Pvt Ltd

List of Practical	
1.	Install Android Studio, Hello World, Logging, Install Android Studio
2.	Make Your First Interactive UI
3.	Working with TextView Elements, Use a scroll view for text with minor HTML formatting
4.	Create and Start Activities
5.	Create a Recycler View Create an activity that displays data in a RecyclerView, Make the items in the list clickable, and Add a floating action button to add items to the list
6.	Theme, Custom Styles, Drawables, Define and use a theme , Define and use a custom style that uses a drawable
7.	Add a FAB and Cards, Create an app that uses a Floating Action Button (FAB), and Add an activity that uses cards. Optionally, style the cards. Customize your app's theme and styles to use Material Design styles and colors
8.	Implement Localized Strings, Create localized strings in your app, and Test by changing the default language
9.	Use Espresso to test your UI, Use Espresso to Test Your UI
10.	Create an AsyncTask, Create a simple AsyncTask to do work in the background
11.	Use AsyncTaskLoader, Use AsyncTaskLoader instead of AsyncTask to show book search results in a RecyclerView
12.	BroadcastReceiver, Create an app with a BroadcastReceiver
13.	Notifications, Trigger a Notification, Add Actions to your Notification
14.	Alarm Manager, Implement an alarm manager
15.	Job Scheduler, Use JobScheduler to do background updates
16.	Firebase Job Dispatcher
17.	Get and Save User Preferences, Implement Settings menu to allow users to enter preferences, Implement code to retrieve and user preferences
18.	Save user data in a database, Create an app that allows users to enter notes, Save the notes in a SQLite Database, Create an app that stores data in an SQL database, Displays the data in a RecyclerView, Allow users to add, delete, and edit data items.
19.	Querying and Searching a Database
20.	Implement a Content Provider, Add a content provider for your SQLite database
21.	Use a ContentResolver to query your data, Use a content resolver to query the database, and Display the results of the query, Use the content resolver to add data to the database
22.	Beta testing your app, Running a beta test on Google Play.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 7**
Type of Course	Core Courses	
Prerequisite	03080504-P - WEB ADMINISTRATION(P)	
Course Objective	1. Easily explanation of different types of server. 2. We can get basic and depth knowledge for IIS role and implementations in server	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	Tutorial	Lab	Credit	SEE	CIA	LAB	Total Marks
3	0	2	3	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Introduction to Server** Network Operating System : Introduction, use,benefits. Various types of web server : Windows NT, Sun Solaris, Windows Server 2008, Red Hat Linux. Windows 2008 server Introduction, Installation of 2008 Server with Active Directory.	10	15
2	**Windows Server 2008 Services** Windows 2008 server: User Interface, Basic Services. Windows Registry, Booting, User Interface, command Prompt, System Maintenance tools., Active Directory, Managing Groups and Group policies	15	20
3	**Managing GPO** Managing users using group policy to manage servers. Create OUs, Linking OUs with GPO ,Networking with TCP/IP. DHCP and IP addressing, DNS	15	25
4	**Backup & Disk Management** Routing and Remote Access Services. Backups in Windows 2008 Server. Types of Backups Normal, Incremental, Differential. Disk Management in Windows 2008 Server	10	20
5	**Raid & Disaster Planning and recovery** Basic Disks and Dynamic Disks, Understanding RAID and its types. Windows server 2008 Services : Terminal Services. File Services, Print Services. Disaster planning and recovery	10	20
	Total	60	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Analyze	Evaluate	Create
Weightage	20	20	30	30

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	Understand the advance networking concepts
CO2	To explore realtime process of networking protocols
CO3	Understanding of router and their strategies in real time environment
CO4	To Evaluate advance networking strategies and their ideas realted protocol
CO5	Configuration of dynamic routing protocols in Cisco Packet tracer

Reference Books	
1.	**Windows Server 2008: Complete Reference** By Danielle Ruest | McGraw-Hill

List of Practical	
1.	Installation of Windows Server and IIS.
2.	Different roles of IIS: Install DNS and ADDS
3.	Configure Wallpaper Policy in IIS.
4.	Configure Lockout Policy in IIS.
5.	Configure Passwords Policy in IIS.
6.	Configure RAID 0 Level in Windows server IIS.
7.	Configure RAID 1 Level in Windows server IIS.
8.	Configure RAID 5 Level in Windows server IIS.
9.	Write down steps to take backup in windows server.
10.	Write down to steps to Data recovery in Windows server.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 7**
Type of Course	Core Courses	
Prerequisite	03060302-T - DIGITAL LOGIC DESIGN	
Course Objective	1. To provide an overview of Wireless Communication networks area and its applications in communication engineering. 2. To appreciate the contribution of Wireless Communication networks to overall technological growth. 3. To explain the various terminology, principles, devices, schemes, concepts, algorithms and different methodologies used in Wireless Communication Networks.	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	1	0	4	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**UNIT 1** Mobile Radio System A reference model, Frequencies for radio transmission, Signals, Antennas, Signal Propagation, Multiplexing. Modulation Characteristics Of Radio Waves : Multipath Characteristics of radio waves signal fading, time dispersion, Doppler spread, coherence time, LCR. Fading statistics. Diversty techniques.	10	10
2	**UNIT 2** Mobile Radio Propagation Mechanism, free space path loss, long distance path loss model, Okumara model, Hata model, PCS model, Wideband PCS, Microcell model, Indoor propagation model, Jake's channel model.	15	20
3	**UNIT 3** Wireless Systems Standards - GSM, signaling & call control, mobility management, location racking wireless data services IS-95, GPRS. Wireless Data Networking IEEE Standards, Models Different layers, wireless LAN, Hypes LAN, Blue tooth. Performance analysis of link & transport layer protocols over wireless channels.	15	25
4	**UNIT 4** Mobile Network Layer Mobile IP: Goals, assumptions & requirements, IP packet delivery, Agent discovery, Registration, tunneling and en capsulation, optimization, Reverse tunneling, IP-V6, Mobile ad-hoc networks. Mobile IP: Goals, assumptions & requirements, IP packet delivery, Agent discovery, Registration, tunneling and en capsulation, optimization, Reverse tunneling, IP-V6, Mobile ad-hoc networks.	10	25
5	**UNIT 5** Mobile Transport Lays Tradition TCP, Classical TCP improvement, TCP over 2.5G/3G wireless networks. Performance enhancing proxies	10	20
	Total	60	100

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	10	20	15	15	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understanding fundamental Concept of Wireless Communication.
CO2	Studying mobile radio system, characteristics of radio waves, Radio propogation, wireless system.
CO3	Studying wireless system and wireless data networking.
CO4	Analyse basics of mobile network layer and mobile transport layer.
CO5	Analyse security, energy efficiency, mobility, scalability and unique characteristics in Wireless Communication Network

Reference Books

1.	**Wireless Communications & Networks (TextBook)** By William Stallings | Pearson Education
2.	**Mobile Communications** By Jochen Schiller | Pearson Education India
3.	**The Wireless Application Protocol (TextBook)** By Sandeep Singhal | Addison Wesley

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Course	Bachelor of Technology (B.Tech.)	**Semester - 7**
Type of Course	Core Courses	
Prerequisite	03070401-T - OPERATING SYSTEM	
Course Objective	1. To get an introduction to Linux Technology. 2. Know how to work with Linux Programming. 3. Learn implementation of Linux scripts and server in real life.	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	Tutorial	Lab	Credit	SEE	CIA	LAB	Total Marks
3	0	2	4	70	30	50	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**LINUX Basics Working with GUI in Linux, Various Linux Distributions, Moving around the desktop (KDE/GNOME)** Concept of open source & Open Licence, GNU, review of Linux Installation, File System Hierarchy, Top Level Di rectories & purpose of main directories. Redhat, SuSe, Ubuntu. Panel, Workspace, Main Menu, Running Applications etc,Terminal emulator & running programs (/Commands) from terminal, Emulator, Using KDE/Gnome for copying, moving, creating directories/files, Using control Centre for installation of hardware/software, User Management, File Permissions and other settings. Mounting Drives. Using Search Utilities in GUI.	15	25
2	**Shell commands, Commands to manage user and groups, File Permissions, Environment variables** Working with Command Line Interface in Linux, File & Pattern Search Utilities, manage user and groups, File Permissions, Editors. ls, touch, rm, mv, cp, mkdir, rmdir, pwd, ps, cat, fg, bg, grep, egrep, regular Expressions groupadd, Groupdel, groupmod, gpasswd, useradd, usermod. Understanding and changing the permissions with chmod, Meaning, using envcommand. PATH, SHELL, TERM, PWD, USER, LANG etc.	10	15
3	**Program development with C in Linux, Shell Programming** Using Editor for writing the source code,compiling, linking with libraries & executing, Using IDE for program development. Pipes & redirection, Shell as a programming language - Interactive programs, creating a script & making a script executable, shell syntax - variable, condition, control structure, functions, debugging scripts, using simple scripts to implement the above topic.	15	25
4	**Working with Files & Directories, File & Directory Maintenance in C** Concept of system calls & device drivers & library functions, Using low level file access and standard I/O library for working with files - like opening, reading, writing, setting permission, closing files etc. Stream functions & stream errors & file descriptors. File & Directory Maintenance in C using chmod,chown, unlink, link, mkdir, rmdir, chdir, getcwd. Scanning directories using opendir, readdir, telldir, seekdir, closedir, Writing programs equivalent to ls command using above feratures.	10	20
5	**concept of terminal, Memory allocation, Creating lock files, DBM, Handling multiple source files, Overview of process & its structure**	10	15

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	Interacting with the UNIX/Linux Environment from your Program, Reading & Writing from the Terminal, Data Management, Managing Memory, File Locking, Development tools & debugging, Processes & Signals, dbm database, Threads. Comm and arguments, using getopt facility, using getenv, putenv, environ for environm ent variables,using time,gmtime, ctime, sftrtime, strptime for calculating date & time, using temporary files, interacting with environment to get user, host & logging information. Canonical mode of reading & writing, handling re-directed output & talking to the terminal using /dev/tty, terminal driver & general terminal interface, overview of using terminal os structure, overview of terminal output for finer screen output control, detecting keystrokes. Allocating lots of memory, abusing memory, null pointer, freeing memory. Locking regions, read & write with locks, competing locks, deadlocks. Database & routines, access functions. Make command & make files, concept of RCS & SCCS & CVS, writing a manual page & distributing software type of errors & general debugging techniques, using gdb, memory debugging. Overview of process & its structure using system, excel, fork, wait, exit for process control, zombie process, signal handling, sending signals, signal sets. Concept of thread, checking for thread support, creating thread & their simultaneous execution, synchronization, cancelling threads.		
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Create
Weightage	20	25	20	15	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understanding of the Linux operating system architecture and its various components, including kernel, shell and utilities.
CO2	Learn editor and implement different commands on linux terminal.
CO3	Test how to work with users accounts and manage system administration.
CO4	Create file system and directories, operate those using programs.
CO5	Evaluate shell scripts, positional parameters and string handling to solve certain problems.

Reference Books

1. **Begining Linux Programming**
By Neil Mathew & Richard Stones | Wrox Press

2. **Instant Linux/Unix (TextBook)**
By Andrew E vans, Neil M athew & Richard Stones | Wrox Press

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List of Practical

1.	Install & test UBUNTU Linux and its features.
2.	Test and run basic & advanced unix commands.
3.	Test commands related with File editing with Vi, Vim, gedit, gcc.
4.	Create a C program to print ”Hello”.
5.	Create a C program to read and display content of a file.
6.	Create a C program to read from command line.
7.	Create a C program to append content of one file to another.
8.	Create a C program to accept a string in lower case letters from a user, & convert to upper case letters.
9.	Create a C program to find numbers of characters, words & lines of a given input file.
10.	Create a C program to reverse a string and display it.
11.	Create a C program to check a string is palindrome.
12.	Create a C program to add two numbers.
13.	Create a C program to reverse the digits of a given 5-digit number.
14.	Create a shell script to print ”Hello”.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 7**
Type of Course	Project work, Seminar and Internship	
Prerequisite		
Course Objective	-	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
0	0	8	4	-	-	100	100

SEE *- Semester End Examination,* ***CIA*** *- Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Project Guideline**		**100**

AIM
This course provides an opportunity for students to apply the knowledge and skills acquired in the core courses to larger and more complex problems and to gain experience in working in teams.
LEARNING OUTCOMES
This course is designed to provide the student experience in working with a client organization from the initial request through a final design and development of prototype software.
The student would be able to..
• Students will be exposed to software development process by choosing a typical business/scientific/administrative/system application.
• Define project scope, assess feasibility, and establish a project schedule. • Get some experience in working with a client organization.
• Gain experience in working in a group for successfully developing the deliverables.
Mode of study: Half / One day off to work on the project in a week. (Atleast three hours must be allotted in weekly timetable for discussion/preparation of deliverables)
Course Contents:
1. Developing System Design
2. Writing code for the project
3. Doing testing of the code Deliverables by the students:

· At the end of the semester, the student should be able to successfully develop the project and prepare the documentation (hard copy) as well as presentation of the project details.
· Live Demo of the Project must be shown at the time of presentation.

Total		**100**

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Course	Bachelor of Technology (B.Tech.)	**Semester - 7**
Type of Course	Discipline Specific Elective Courses	
Prerequisite	Advance java | 03070302-T - DATABASE MANAGEMENT SYSTEM	
Course Objective	1. To understand the overall vision of the Semantic Web 2. To analyze the current technology stack (URIs, XML, RDF/S, OWL) 3. To understand how one could use these technologies for building something useful 4. To define and test an ontology 5. To define schema mappings To understand the overall vision of the Semantic Web	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Data Model** Introduction to Modeling Web Data, Semi structured data, XML, Web Data Management with XML, XML Standards, XML and syntax, XML Data Model, XLink, and XPointer.	10	12
2	**XPath and XQuery** Introduction, Basics of XPath and XQuery, XPath: Steps and path expressions, Evaluation of path expressions, Generalities on axes and node tests, Axes, Node tests and abbreviations, Predicates, XPath 2.0; FLWOR expressions in XQuery: Defining variables - the for and let clauses, Filtering - the where clause, The return clause, Advanced features of XQuery; XPath foundations.	12	15
3	**Typing, XML Query Evaluation** Motivating Typing, Automata, Schema Languages for XML, Typing Graph Data: Graph Semi structured Data, Graph Bisimulation, Data guides. XML fragmentation, XML identifiers: Region-based identifiers, Dewey-based identifiers, Structural identifiers and updates; XML evaluation techniques: Structural join, Optimizing structural join queries, Holistic twig joins.	15	22
4	**Ontologies, RDF, and OWL, Querying Data through Ontologies** Introduction, Ontologies by example, Web resources, URI, namespaces, RDF, RDFS: RDF Schema, OWL, Ontologies and (Description) Logics. Introduction, Querying RDF data: notation and semantics, Querying through RDFS ontologies, Answering queries through DL-LITE ontologies.	10	27
5	**Data Integration, Building Web scale applications**	13	24

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	Introduction, Containment of conjunctive queries, Global-as-view mediation, Local-as-view mediation, Ontology-based mediators, Peer-to-Peer Data Management Systems. Web search, web crawlers, web information retrieval, Web graph mining and hot topics in web search, Distributed systems, failure management, Required properties of a distributed system, P2P networks, Hash-based structures, distributed indexing, Distributed Computing with Map-Reduce.		
		Total	**60**	**100**

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Suggested Distribution Of Theory Marks Using Bloom's Taxonomy					
Level	Understanding	Application	Analyze	Evaluate	Create
Weightage	20	20	20	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes	
At the end of this course, students will be able to:	
CO1	To understand the overall vision of the Semantic Web
CO2	To analyze the current technology stack (URIs, XML, RDF/S, OWL)
CO3	To understand how one could use these technologies for building something useful
CO4	To define and test an ontology
CO5	To define schema mappimgs & to install and use tools dor semantic data management

Reference Books	
1.	**"Web Enabled Commercial Applications Development using HTML, DHTML, Javascript, Perl CGI"** By Ivan Bayross, | BPB, 2004.
2.	**Semantic Web programming** By John Hebleret.el | Wiley

List of Practical	
1.	Create an XML file defining an article in newspaper.
2.	Create an XML file containing list of students. Also create style sheet file to display list in an HTML format.
3.	Create an XML file containing list of students. Using XPath display following information:- 1.Information of a student with ID No : 101 2.All the student in the sorted order according to their CGPA
4.	Create an XForm to collect information from staff member regarding their publications. Details like Year of Publication, National/International, Title, Conference/Journal etc.
5.	From the above gathered information, using XQuery find out the number of publication in a specific year.
6.	Demonstrate the use of AJAX.
7.	Study of XMLSPY tool.
8.	Create an RSS for the events occurring in your institute
9.	Write a program to read the articles in RSS created in above practical
10.	tudy of RDF (Resource Description Framework)

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EVOLVING THINKING MINDS

Subject Syllabus

Course	Bachelor of Technology (B.Tech.)	**Semester - 7**
Type of Course	Discipline Specific Elective Courses	
Prerequisite	Basic Programming skills | 03070501-T - COMPUTER NETWORK	
Course Objective	1. To learn how to use Cloud Services 2. To implement Virtualization, Task scheduling algorithm and to build private network. 3. Apply Map-reduce concept to applications	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Introduction to Cloud Computing** Overview, Roots of Cloud Computing, Layers and Types of Cloud, Desired Features of a Cloud, Benefits and Disadvantages of Cloud Computing. Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks	10	15
2	**Cloud Architecture ,Services and Applications** Exploring the Cloud Computing Stack, Connecting to the Cloud, Infrastructure as a Service, Platform as a Service, Saas Vs. Paas, Using PaaS Application Frameworks, Software as a Service. Cloud Deployment Models: Public vs Private Cloud, Cloud Solutions, Cloud ecosystem, Service management, Computing on demand, Identity as a Service, Compliance as a Service.	15	25
3	**Abstraction and Virtualization** Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hyper visors, Understanding Machine Imaging, Porting Applications Virtual Machines Provisioning and Manageability Virtual Machine Migration Services, Virtual Machine Provisioning and Migration in Action, Provisioning in the Cloud Context. Virtualization of CPU, Memory , I/O Devices, Virtual Clusters and Resource management, Virtualization for Data Center Automation	15	25
4	**Cloud Infrastructure and Cloud Resource Management** Architectural Design of Compute and Storage Clouds, Layered Cloud Architecture, Development, Design Challenges, Inter Cloud Resource Management, Resource provisioning and Platform Deployment, Global Exchange of Cloud Resources, Administrating the Clouds, Cloud Management Products, Emerging Cloud Management Standards.	10	15
5	**Cloud Security** Security Overview , Cloud security challenges, Cloud Security Challenges and Risks Software-as-a-Service Security. Cloud computing security architecture: Architectural Considerations, General Issues Securing the Cloud, Securing Data, Application Security, Virtual Machine Security Identity and Presence Identity Management and Access Control. Autonomic Security Establishing Trusted Cloud computing, Secure Execution Environments and Communications, Identity Management and Access control Identity management, Access control, Autonomic Security Storage Area Networks, Disaster Recovery in Clouds	10	20
	Total	60	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Create
Weightage	20	20	20	10	30

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NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	Analyze the different layers Cloud computing using different architectures with it's advantages and disadvantages.
CO2	Explore the Cloud Architecture along with IaaS, SaaS, PaaS using Application Frameworks.
CO3	Use the concept of Abstraction and Virtualization of CPU, Memory , I/O Devices, Virtual Clusters and Resource management
CO4	Understand the Cloud Infrastructure and Resource Management in Cloud Computing
CO5	Learn about Cloud Security to overcome different types of Challenges and Risks.

Reference Books	
1.	**Cloud Computing Bible** By Barrie Sosinsky | Wiley India
2.	**Cloud Computing: Principles and Paradigms** By Rajkumar Buyya, James Broberg, Andrzej M. Goscinski | Wiley India
3.	**Cloud Computing: Principles, Systems and Applications (TextBook)** By Nikos Antonopoulos, Lee Gillam | Springer 2012

List of Practical	
1.	Cloud SPI models
2.	Case studies on a. Infrastructure as a Service (IaaS),Virtualization, Platform as a service b. (PaaS), Cloud platform management, c. Software as a Service
3.	Data security and Storage, Data privacy, Access management, Cloud computing standards and Interoperability
4.	Case Study: Amazon Web Services

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Course	Bachelor of Technology (B.Tech.)	**Semester - 7**
Type of Course	Discipline Specific Elective Courses	
Prerequisite	03080602-T - DATAWAREHOUSING AND MINING	
Course Objective	1.Understand Big Data and Hadoop ecosystem. 2.Implement data processing with Hadoop. 3. Analyze large-scale datasets using Hadoop's MapReduce. 4. Utilize Apache Hive, Pig, Kafka for data processing. 5. Apply Apache Spark for real-time data processing.	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
3	0	2	4	70	30	50	150

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Introduction to Big Data and Hadoop** Introduction to Big Data, Definition and characteristics of Big Data, Types of data and their sources, Challenges in processing and analyzing Big Data, Introduction to Hadoop, Overview of Hadoop and its architecture, Hadoop Distributed File System (HDFS), MapReduce paradigm	10	20
2	**Hadoop Ecosystem:** HBase, Hive, Pig, Sqoop, Flume components. Roles and functionalities of Hadoop ecosystem components. **Hadoop MapReduce:** MapReduce programming model. Writing MapReduce jobs in Java. Hands-on exercises. **Apache Hive and Pig:** Introduction and features. Querying and analyzing data in Hive using HiveQL. Hive data modeling and optimization techniques. Introduction to Apache Pig and its features. Data transformation and analysis using Pig's Pig Latin scripting language.	15	20
3	**Real-time Data Processing and Integration** Apache Kafka, Introduction to Apache Kafka and its architecture, Kafka producers and consumers, Real-time data ingestion and processing with Kafka, Apache Spark Introduction to Apache Spark and its features, Spark RDDs and DataFrames Spark SQL for querying and analyzing data	15	20
4	**NoSQL Databases and Advanced Hadoop Concepts** NoSQL Databases and Hadoop Integration, Introduction to NoSQL databases (e.g., HBase), Integration of NoSQL databases with Hadoop, Hands-on exercises, Advanced Hadoop Concepts, Data partitioning and optimization techniques, Cluster management and monitoring tools (e.g., Apache Ambari) Performance tuning and scalability considerations	10	20
5	**Big Data Analytics with Hadoop**	10	20

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Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
	Introduction to machine learning and data mining with Hadoop, Using Hadoop for data analytics and predictive modeling. Implementing machine learning algorithms with Hadoop. **Data Security and Governance in Hadoop:** Overview of data security challenges in Hadoop. Securing data at rest and in transit Compliance and governance considerations **Real-world Use Cases and Project Work:** Exploration of real-world applications of Big Data and Hadoop. Analysis of case studies and best practices. Undertaking a hands-on project using Hadoop tools and technologies. Implementation, documentation, and presentation. **Project Presentations and Wrap-up:** Final project presentations by students. Recap of the course. Discussion of future trends in Big Data and Hadoop		
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate
Weightage	15	15	20	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand Big Data and Hadoop ecosystem.
CO2	Implement data processing with Hadoop.
CO3	Analyze large-scale datasets using Hadoop's MapReduce.
CO4	Utilize Apache Hive, Pig, Kafka for data processing.
CO5	Apply Apache Spark for real-time data processing.

Reference Books

1.	**Hadoop: The Definitive Guide (TextBook)** By Tom White | Third Edit on, O'reily Media, 2012
2.	**Hadoop in Practice** By Alex Holmes | Manning Publications
3.	**Apache Kafka: The Definitive Guide (TextBook)** By Neha Narkhede | O'Reilly Media

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List of Practical	
1.	Setting up Hadoop Cluster: Install and configure Hadoop, HDFS, and MapReduce.
2.	Data Ingestion and Processing: Use Sqoop or Flume to ingest large-scale data into Hadoop. Process data with MapReduce or Apache Pig.
3.	Data Querying and Analysis with Hive: Create tables in Hive, load data, and execute HiveQL queries.
4.	Data Transformation and Analysis with Pig: Write Pig Latin scripts for data transformation and analysis.
5.	Real-time Data Processing with Kafka and Spark: Set up Kafka for real-time data ingestion. Develop Spark Streaming applications.
6.	Integrating NoSQL Databases: Install and configure a NoSQL database like HBase within Hadoop.
7.	Machine Learning with Hadoop: Preprocess data using Hive, Pig, or Spark. Implement machine learning algorithms.
8.	Project Work: Undertake a hands-on project using Hadoop tools. Implement data analysis, processing, and visualization

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Course	Bachelor of Technology (B.Tech.)	**Semester - 8**
Type of Course	Discipline Specific Elective Courses	
Prerequisite	Known about Basic Business Management	
Course Objective	-	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	Tutorial	Lab	Credit	SEE	CIA	LAB	Total Marks
3	0	0	3	70	30	-	100

SEE *- Semester End Examination,* ***CIA*** *- Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Introduction to E-Commerce & Technology Infrastructure** Business Model, Revenue models and business processes, Opportunities- nature of ecommerce, Internet protocols, Internet2 and semantic web.	15	25
2	**E-Commerce to E-Business and Spotting Business Trends & Architecture** Flexible business design. Definition of value, E-Business Communities Customization and integration, E-Business, Business engineering customer relationship management.	10	15
3	**Digitizing the Business and Thinking E-Business Design & E-Business Backbone** E-channel pattern, E-portal pattern, E-market maker pattern, Self-diagnosis, ERP, SCM	15	25
4	**Business Process Model &Environment of E-Commerce** Legal, Ethical and Tax Issues, Legal environment, Use and protection, Online crime, Terrorism and warfare, Ethical issue, Customer centric business, Preorder, Point of order and post order customer support.	10	20
5	**Business to Business Strategy from Electronic Data Interchange to E-Commerce & E-Commerce Software and Payment Systems** Purchasing, Logistics and support activities, Electronic data interchange, EDI on internet, Web hosting alternatives, Basic and advance functions of e-commerce software, Software for small, Mid-size and large businesses, Online payment basic, Payment cards, Electronic cash, Electronic wallets, Stored value cards, Internet technologies and banking.	10	15
	Total	60	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	10	20	30	20	10	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	Understand how e commerce work and benefits online platform
CO2	Learn different business models with example
CO3	Understand ethical, social and security issues of information system
CO4	Understanding of different protocols and their comparison
CO5	Analyze payment modes and security threat

Reference Books	
1.	**Foundation of E-Business (TextBook)** By Stevan Alter | pearson

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Course	Bachelor of Technology (B.Tech.)	**Semester - 8**
Type of Course	Discipline Specific Elective Courses	
Prerequisite	03080503-T - SOFTWARE ENGINEERING	
Course Objective	1. To understand concepts and importance of Software project management concepts 2. To understand cost estimation, scheduling principles	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	Tutorial	Lab	Credit	SEE	CIA	LAB	Total Marks
3	0	0	3	70	30	-	100

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT** Project Definition ,Contract Management, Activities Covered By Software Project Management, Overview Of Project Planning, Stepwise Project Planning	10	15
2	**PROJECT EVALUATION** Strategic Assessment, Technical Assessment, Cost Benefit Analysis, Cash Flow Forecasting , Cost Benefit Evaluation Techniques, Risk Evaluation	15	25
3	**ACTIVITY PLANNING** Project Schedule ,Sequencing and Scheduling Activities, Network Planning Models Forward Pass ,Backward Pass ,Activity Float , Shortening Project Duration, Activity on Arrow Networks, Risk Management ,Nature Of Risk ,Types Of Risk , Managing Risk Hazard Identification , Hazard Analysis, Risk Planning And Control	15	25
4	**MONITORING AND CONTROL** Creating Framework, Collecting The Data ,Visualizing Progress, Cost Monitoring, Earned Value, Prioritizing Monitoring, Getting Project Back To Target - Change Control, Managing Contracts, Introduction, Types Of Contract, Stages In Contract, Placement, Typical Terms Of A Contract ,Contract Management , Acceptance	10	20
5	**MANAGING PEOPLE AND ORGANIZING TEAMS** **Introduction :** Understanding Behavior **Organizational Behavior:** A Background :Selecting The Right Person For The Job Instruction In The Best Methods **Motivation:** The Oldman, Hackman Job Characteristics Model, Working In Groups, Becoming A Team ,Decision Making ,Leadership , Organizational Structures ,Stress ,Health And Safety	10	15
	Total	60	100

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	25	25	20	10	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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Course Outcomes	
At the end of this course, students will be able to:	
CO1	Apply project management concepts and techniques to an IT project.
CO2	Explain project management in terms of the software development process.
CO3	Apply project management concepts through working in a group as team leader.
CO4	Identify the key phases of project management.
CO5	Determine an appropriate project management approach through an evaluation of the business context and scope of the project.

Reference Books	
1.	**Managing Global Projects (TextBook)** By Ramesh Gopalaswamy | Tata McGraw Hill
2.	**Software Project Management (TextBook)** By Bob Hughes, Mike Cotterell | Tata McGraw Hill

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Course	Bachelor of Technology (B.Tech.)	**Semester - 8**
Type of Course	Project work, Seminar and Internship	
Prerequisite		
Course Objective	-	

Teaching Scheme (Contact Hours)				Assessment Scheme			
				Theory Marks			
Lecture	**Tutorial**	**Lab**	**Credit**	**SEE**	**CIA**	**LAB**	**Total Marks**
0	0	0	12	-	-	300	300

***SEE** - Semester End Examination, **CIA** - Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.)*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Project Guideline**		**100**

AIM

This course provides an opportunity for students to apply the knowledge and skills acquired in the core courses to larger and more complex problems and to gain experience in working in teams.

LEARNING OUTCOMES

This course is designed to provide the student experience in working with a client organization from the initial request through a final design and development of prototype software.

The student would be able to..

• Students will be exposed to software development process by choosing a typical business/scientific/administrative/system application.

• Define project scope, assess feasibility, and establish a project schedule. • Get some experience in working with a client organization.

• Gain experience in working in a group for successfully developing the deliverables.

Mode of study: Half / One day off to work on the project in a week. (Atleast three hours must be allotted in weekly timetable for discussion/preparation of deliverables)

Course Contents:

1. Developing System Design
2. Writing code for the project
3. Doing testing of the code Deliverables by the students:

· At the end of the semester, the student should be able to successfully develop the project and prepare the documentation (hard copy) as well as presentation of the project details.

· Live Demo of the Project must be shown at the time of presentation.

Total		**100**

Dean
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