PEOPLE'S UNIVERSITY, BHOPAL

PROGRAMME: B. Tech. (CSE)   **SEM: III**

Subject Title	Subject Code	Credits		Theory		
Mathematics-II	**BT-301**	**L**	**T**	**Externals (70)**	**Internals (30)**	**Total (100)**
		3	1	Min: 28 (D Grade)	Min: Nil	Min: 40 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal - Max Marks: 30

Best of Two Mid Semester Test   – Max Marks: 15
Assignment / Quiz   – Max. Marks: 15

Unit	Contents *(Theory)*
I	**FOURIER SERIES:** Introduction of Fourier series, Fourier series for Discontinues Functions, Fourier series for even and odd function, half range series and method of Least Squares.
II	**LAPLACE TRANSFORMATIONS :** Introduction of Laplace Transform of elementary functions, Properties of Laplce transform ,Change of scale property, second shifting property, Laplace transform of the derivative, Inverse Laplace transform and its properties, Convolution theorem and Applications of Laplace Transformation to solve the ordinary differential equations
III	**SECOND ORDER LINEAR DIFFERENTIAL EQUATIONS with VARIABLE COEFFICIENTS:** Methods one integral is known, removal of first derivative, changing of independent variable and variation of parameter.
IV	**LINEAR & NON – LINEAR DIFFERENTIAL EQUATIONS of FIRST ORDER :** Formulation of partial differential equations, solution of equation by direct integration, lagrange's Linear equation, charpit's method, Linear partial differential equation of second and higher order, Linear homogeneous and Non-homogeneous partial differential equation of nth order with constant coefficients.
V	**VECTOR CALCULUS :** Differentiation of vectors, scalar and vector point function, geometrical meaning of Gradient, Unit Normal vector and directional derivative, physical interpretation of divergence and curl, line integral, surface integral and volume integral, Green's Stroke's and gauss divergence theorem.

TEXT BOOKS:

1. D.C. Aggarwal "Engg. Mathematics – 2"
2. Higher Engineering Mathematics by BS Grewal, Khanna Publication
3. Mathematics for Engineers by S.Arumungam, SCITECH Publications

REFERENCES:

1. Advanced Engineering Mathematics by Erwin Kreyszig, Wiley India
2. Advance Engineering Mathematics by D.G.Guffy
3. Engineering Mathematics by S S Sastri. P.H.I.
4. Advanced Engineering Mathematics by Peter V.O'Neil, Thomson Learning
5. Higher Engineering Mathematics by John Bird, Elsevier

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PROGRAMME: B. Tech. (CSE)   **SEM: III**

Subject Title	Subject Code	Credits		Theory		
Data Structures and Algorithm		**L**	**T**	**Externals (70)**	**Internals (30)**	**Total (100)**
	BT 312	3	1	Min: 28 (D Grade)	Min: Nil	Min: 40 (D Grade)

Duration of Theory (Externals): 3 Hours
Theory Internal - Max Marks: 30

      Best of Two Mid Semester Test   –Max Marks: 15
      Assignment / Quiz   – Max. Marks: 15

Unit	Contents *(Theory)*
I	**INTRODUCTION TO DATA STRUCTURE** Basic terminology, Data types and its classification, Algorithm complexity notations like big O, Ώ, Φ. Application: Storage pools, Garbage collection and compaction Complexity of algorithm (Best, worst, average), Asymptotic analysis.
II	**LINEAR DATA STRUCTURE** Array Definition, Representation and Analysis of Arrays, Single and multidimensional arrays, Address calculation, Arrays as parameters, Ordered list and operations, sparse and matrices, and garbage collection ,Stack, Array implementation of stack, Linked Representation of stack, Application of stack, Conversion of infix to prefix and postfix Expressions and expression evaluation, Queue Array and linked implementation of queues, Circular Queues, D- queues and priority Queues, Linked list in array
III	**TREES** Basic terminology, Binary trees, property of binary tree, binary search property/s heap property,Quering a binary search tree, Algebraic expressions, complete binary tree, Extended binary trees, Array and linked representation of binary trees, traversing Binary trees, Threaded Binary trees, Binary search trees (BST), AVL Tress, and B trees. Application: Algebraic Expression
IV	**SORTING & SEARCHING TECHNIQUES** Searching Techniques (Linear search, binary search) Sorting – Internal Sorting – Bubble Sort, Insertion Sort, Quick Sort, Heap Sort, BinSort, Radix Sort – External Sorting – Merge Sort, Multi-way Merge Sort, Polyphase Sorting - Design Techniques - Divide and Conquer - Dynamic Programming - Greedy Algorithm Backtracking - Local Search searching and hashing: Sequential search, Binary search, Hash table implementation, Symbol table, Static tree table, Dynamic tree table.
V	**GRAPH** Introduction, sequential representations of graphs, adjacency Matrices, Traversal, Connected Component and spanning trees, Minimum cost of spanning trees, Dijkstras algorithm.

TEXT BOOKS:
1. Lipschutz; Data structure (Schaum); TMH
2. Horowitz and Sahani, "Fundamentals of data Structures", Galgotia Publication Pvt. Ltd., N. Delhi.
3. M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd., New Delhi.

REFERENCES
1. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education Asia, Delhi-2002
2. Radha Ganesan "Data Structure using C",Scitech Publication PVT.LTD. Chennai
3. Data Structures Trembley and Sorenson, TMH Publications
4. Pai; Data structure and algorithm; TMH
5. Anup.Kr.Bhaumik,Data Structure and Algorithm, S.Chand New Delhi
6. Agrawal and Birthare," Data Structure using C and C++, Kamal Prakashan,Indore

Subject Title	Subject Code	Credits	Practical		
Data Structures and Algorithm		**P**	**Externals (30)**	**Internals (20)**	**Total (50)**
	BT 312	2	Min: 12 (D Grade)	Min: Nil	Min: 20 (D Grade)

Practical Internal - Max Marks: 20

Lab work & Sessional   –Max Marks: 10
Assignment / Quiz   – Max. Marks: 10

PRACTICALS:
Suggested list of experiments (expandable)

1. Write a program to show Array in C
2. Write a program to implement Stack using array.
3. Write a program to implement stack using linked list.
4. Write a program to implement Queue using array.
5. Write a program to implement Binary Tree.
6. Write a program to implement Binary Search Tree.
7. Write a program to implement bubble sort algorithm.
8. Write a program to implement linear search algorithm.
9. Write a program to implement Binary Search Algorithm.
10. Write a program to implement BFS and DFS Algorithm.

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PROGRAMME: B. Tech. (CSE)   **SEM: III**

Subject Title	Subject Code	Credits		Theory		
		L	**T**	**Externals (70)**	**Internals (30)**	**Total (100)**
Digital Circuit & Systems	**CST 303**	3	1	Min: 28 (D Grade)	Min: Nil	Min: 40 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal - Max Marks: 30
            Best of Two Mid Semester Test   –Max Marks: 15
            Assignment / Quiz   – Max. Marks: 15

Unit	Contents *(Theory)*
I	**NUMBER SYSTEMS & LIGIC GATES:** Number systems & codes, Binary arithmetic, Boolean algebra and switching function, Error types, correction and detection, Hamming code, De Morgan's Theorem, Introduction to logic gates, Universal gate, Combination and sequential circuits.
II	**MINIMIZATION & COMBINATIONAL LOGIC CIRCUITS :** Minimization of switching function, Concept of prime implica t, Karnaugh map method, Cases with don't care terms, Half adder, Half subtractor, Full adder, Full subtractor Circuits, serial & parallel addition, BCD adders, Look-ahead carry generator and Logic circuit design
III	**FLIP FLOPS & COMBINATIONAL CIRCUITS :** Flip flops, RS, JK, D, T, Master slave flip flop, Diode, Transistor, Diode as a switch, Transisitor as a switch, Decoders, Encoders, Multiplexers, Demultiplexers and Designing of Combinational circuits like code converters.
IV	**COMBINATIONAL CIRCUITS & MULTIVIBRATORS :** Introduction to various semiconductor Memories, PLA, Introduction to Shift Registers, Counters, Synchronous & asynchronous counters, Astable, Monostable & Bitable multivibrator, Schmitt trigger, IC 555 Timer, Introduction to Logic families and CMOS.
V	**MODULATION TECHNIQUES:** Introduction to Modulation and Modulation Techniques, Introduction to Analog to Digital & Digital to Analog conversion.

TEXT BOOKS:

1. M. Mano; "Digital Logic & Computer Design"; PHI.
2. Kapoor, Digital Electronics,Macmillan Publishers India LTD
3. R. K. Gaur "Digital Electronics"
4. Khan & Khan "DIGITAL LOGIC & DESIGN" SCITECH
5. P Raja "DIGITAL ELECTRONICS" SCITECH

REFERENCES:

1. S.S. Bhatti & Rahul Malhotra, "Digital Electronics", IK Publications
2. W.H. Gothman; "Digital Electronics"; PHI.
3 Millman & Taub; "Pulse, Digital & Switching Waveforms"; TMH
4. Jain RP; Modern digital Electronics; TMH
5. R.J. Tocci, "Digital Systems Principles & Applications".

Subject Title	Subject Code	Credits	Practical		
Digital Circuit & Systems	**CST 303**	**P**	**Externals (30)**	**Internals (20)**	**Total (50)**
		2	Min: 12 (D Grade)	Min: Nil	Min: 20 (D Grade)

Practical Internal - Max Marks: 20

Lab work & Sessional —Max Marks: 10
Assignment / Quiz – Max. Marks: 10

PRACTICALS:
Suggested list of experiments (expandable)

1. Study & Test of Operation of Basic Logic Gates
2. Study & Test of Universal Logic Gates
3. Study & Test of Exclusive Logic Gates
4. Verification of Demorgan's theorem.
5. To construct of half adder and full adder
6. To construct of half subtractor and full subtractor circuits
7. Study & Test of RS Flio Flop & D Flip Flop
8. Study & Test of JK Flip Flop & T Flip Flop
9. Study of Multiplexer and Demultiplexer Circuits.
10. Study of Encoder and Decoder Circuits.

PEOPLE'S UNIVERSITY, BHOPAL

PROGRAMME: B. Tech. (CSE)   **SEM: III**

Subject Title	Subject Code	Credits		Theory		
Object Oriented Programming	CST - 314	**L**	**T**	**Externals (70)**	**Internals (30)**	**Total (100)**
		3	1	Min: 28 (D Grade)	Min: Nil	Min: 40 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal - Max Marks: 30

    Best of Two Mid Semester Test   –Max Marks: 15
    Assignment / Quiz   – Max. Marks: 15

Unit	Contents *(Theory)*
I	**INTRODUCTION to OOP :** Introduction to OOP paradigm, need for OOPS, differences Between OOP and Procedure Oriented Programming, Overview of OOP principles, Introduction to Objects, Objects as software units, Objects instantiations and interactions, Object lifetime, Static and dynamic objects, global and local objects, Modeling the real world objects and Modularity
II	**CLASS :** Introduction to Classes, difference Between Structure & classes, Static data member, Static member function, Abstract data types, Friend function, Inline function, Scope resolution expression, Member Selection Expression, Metaclass, Introduction to Constructor, its Types and Destructor.
III	**INHERITANCE :** Introduction to Inheritance, Types of Inheritance, Introduction to Access Specifiers, Introduction to Specialization and Generalization, Introduction to Association and Aggregation, Introduction to Object Interaction and Message Passing Techniques
IV	**POLYMORPHISM :** Introduction to Polymorphism, Types of polymorphism, Static and dynamic Binding, Introduction to Overloading, Function overloading, Operator Overloading, Difference Between Overloading and Overriding, Introduction to Virtual Functions and Pure Virtual Functions, Generic Polymorphism and Templates.
V	**STREAM CLASSES :** Introduction to C++, C++ Streams, Stream classes, Dynamic Memory Allocation, Introduction to Garbage Collection, Introduction to 'new' and 'delete' operators, Introduction to Exception Handling and its Operations

TEXT BOOKS:

1.."Object Oriented programming with C++", E. Balaguruswamy, TMH, 2001
2. MISHRA "OOP with C++" SCITECH
3. N.Parimala "Object orientation through C++",Macmillan Publishers India LTD.

REFERENCES:

1. "Object Oriented Design and Modelling", Rambaugh James etal,PHI-1997
2. "Object Oriented Programming in C++", R. Lafore, Galgotia Publications Pvt. Ltd.
3. "Object Oriented Programming in c++", Shashi Banzal, Kamal Prakashan, Indore

Subject Title	Subject Code	Credits	Practical		
Object Oriented Programming	CST - 314	P	Externals (30)	Internals (20)	Total (50)
		2	Min: 12 (D Grade)	Min: Nil	Min: 20 (D Grade)

Practical Internal - Max Marks: 20

    Lab work & Sessional   –Max Marks: 10

    Assignment / Quiz   – Max. Marks: 10

PRACTICALS:

Suggested list of experiments (expandable)

1. Program to Implement Object and Class
2. Program to Access private members of a class using Friend Function
3. Program to invoke member of a class using constructor
4. Program to implement Parameterized Constructor
5. Program to implement Single Inheritance
6. Program to Implement Multiple Inheritance
7. Program to Implement Polymorphism using function overloading
8. Program to implement Generic Polymorphism using Templates
9. Program to implement Dynamic Memory Allocation using "new" and "delete" Operators
10. Program to implement Virtual Functions to show Polymorphism

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PROGRAMME: B. Tech. (CSE)   **SEM: III**

Subject Title	Subject Code	Credits		Theory		
Internet Technologies		**L**	**T**	**Externals (70)**	**Internals (30)**	**Total (100)**
	CST 315	3	1	Min: 28 (D Grade)	Min: Nil	Min: 40 (D Grade)

Duration of Theory (Externals): 3 Hours
Theory Internal - Max Marks: 30
          Best of Two Mid Semester Test   –Max Marks: 15
          Assignment / Quiz   – Max. Marks: 15

Unit	Contents *(Theory)*
I	**INTRODUCTION to INTERNET :** Internet Evolution, Concepts, Internet Vs Intranet, Internet Services USENET, GOPHER, WAIS, ARCHIE (WWW) - History, Working, Web Browsers, Its Functions, URLs, Web Sites, Domain Names, Concept of Search Engines, Search Engines types, Web Servers, E-Mail: Sending & Receiving Email, Free E-Mail Services, Introduction to Blogs, Information Communication Technologies (ICT), Accessing ICT and Information Societies.
II	**HTML :** Concepts of Hypertext, Static and Dynamic Pages, HTML Introduction, Features, Uses & Versions Using Various HTML Tags, Elements of HTML Syntax, Head & Body Sections, , Inserting Texts, Text Alignment.
III	**CSS with HTML:** Using Images In Pages, Hyperlinks Text and Images, Bookmarks, Backgrounds and Color Controls, Creating and Using Tables in HTML, Use of Font Size & Attributes, List Types and its Tags. Introduction to WYSIWYG Design tools for HTML, Overview of MS- FrontPage, Introduction to CSS, its Types and its Application for Formatting of HTML Pages.
IV	**JAVA SCRIPT:** JavaScript Overview, JavaScript and the WWW, JavaScript vs. Java, JavaScript versions, JavaScript Comments, Variables: Variables overview, declaring variables, Types of variables, Casting variables. JavaScript Alert box, Prompt & confirm. Expressions, Operators, Precedence, Statements: If statement, For statement, While statement, Break/Continue, Introduction to XML, AJAX and their Applications
V	**E COMMERCE :** E - Commerce an Introductions, Concepts, Advantages and Disadvantages, Internet & E-Business, Applications, Electronic Payment Systems: Introduction, Types of Electronic Payment Systems, Smart Cards and Credit Card-Based Payment Systems, Introduction E-Governance and its applications

TEXT BOOKS :
1. Level Module - M 1.2 - Internet & Web Page Designing By V.K.Jain – Bpb Publications.
2. E-Commerce An Indian Perspective (Second Edition) - By P. T. Joseph, S.J. Presentice-Hall Of India
3. Internet For Everyone - Alexis Leon And Mathews Leon, Vikas Publishing House Pvt. Ltd., New
 Delhi
4. ITL Solutions," Internet and Web Design" Macmillan Publishers India Ltd.

REFERENCES
1. Learn Html In A Weekend By Steven E. Callihan, Phi
2. Using Html By Lee Anne Phillips,
3. Phi Teach Yourself Javascript In 24 Hrs. By Michael Moncur, T Echmedia

Subject Title	Subject Code	Credits	Practical		
Internet Technologies		P	Externals (30)	Internals (20)	Total (50)
	CST 315	2	Min: 12 (D Grade)	Min: Nil	Min: 20 (D Grade)

Practical Internal - Max Marks: 20

Lab work & Sessional   –Max Marks: 10
Assignment / Quiz   – Max. Marks: 10

List of Practical:
Suggested list of experiments (expandable)

1. Study of Internet and its Services
2. Study of Search Engines
3. Designing of a Blog
4. Study of ICT
5. Designing a Web Page using Basic HTML Tools
6. Designing Web Page using Table Attributes
7. Designing Web Page using Forms
8. Designing Web Page with Formatting by CSS
9. Designing a Page using Microsoft Office Front Page
10. Implementation of Conditional and Looping Statements in Java Scripts

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PROGRAMME: B. Tech. (CSE)   **SEM: III**

Subject Title	Subject Code	Credits	Practical		
C++ Programming	CST 306	**P**	**Externals (30)**	**Internals (20)**	**Total (50)**
		2	Min: 12 (D Grade)	Min: Nil	Min: 20 (D Grade)

Practical Internal - Max Marks: 20

Lab work & Sessional   –Max Marks: 10

Assignment / Quiz   – Max. Marks: 10

Unit	Contents *(Practical)*
I	**C++ Basics:** Structure of a C++ program, Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions, Pointers, Arrays, Strings, Structures, conditional statement, control structure, switch-case, break, go to statements.
II	**OOPS :** Introduction to OOPS, differences Between OOP and Procedure Oriented Programming, Overview of OOP principles.
III	**FUNCTIONS & CLASSES : Functions:** Scope of variables, Parameter passing, Default arguments, inline function, Recursive function, Dynamic memory allocation and reallocation, operators-new and delete, Preprocessor directives, **Classes:** Class Definition, Class Structure, Class Scope,object, Friends to a class, Static class members, Constructors and Destructors, Dynamic creation and destruction of objects, Data Abstraction.
IV	**INHERITANCE:** Inheritance: Defining a class hierarchy, Different forms of inheritance, Defining the Base and Derived classes, Access to the base class member.
V	**POLYMORPHISM :** Function overloading, Operator Overloading , Virtual Function Polymorphism: Static and Dynamic binding, Base and Derived class virtual functions, Pure virtual functions, Abstract classes, C++ Exception Handling and File Handling, Comparison of C++ with C, Java and C#.

TEXT BOOKS:
1."Object Oriented programming with C++", E. Balaguruswamy, TMH, 2001
2. Let us C++ by Yashwant Kanitkar
3. "Object Oriented Programming with C++", Radha Ganesan**,** Scitech Publication PVT.LTD. Chennai
4. Padam Gulwani & Anshuman Sharma, Elementary Concepts of Computer Design and Hardware,
   Kamal Prakashan, Indore

REFERENCES   1) ERIC NAGLER "Learning C++" JAICO Pub.

List of Practical:
Suggested list of experiments (expandable)
1) Program to print any Message
2) Program for Conditional Statements, Looping Statements and Switch Case
3) Program to implement Arrays, Strings and Pointers
4) Program to implement Functions and Dynamic Memory Allocation
5) Program to implement Class and Objects
6) Program to implement Friend Functions and Constructors
7) Program for Inheritance
8) Program for Polymorphism
9) Program for File Handling
10) Program for Exception Handling