PEOPLE'S UNIVERSITY, BHOPAL

Programme: **B. Tech. (Information Technology)**   **Semester -V**

Subject Title	Subject Code	Credits			Theory		
Entrepreneurship & IPR	**BT- 501**	**L**	**T**	**P**	**Externals (70)**	**Internals (30)**	**Total (100)**
		3	1	-			Min: 40 (D Grade)

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

Best of Two Mid Semester Test   –Max Marks: 20
Assignment / Quiz   – Max. Marks: 10

Unit	Contents (Theory)
I	**Entrepreneurship**: definition and functions of an entrepreneur, qualities of a good entrepreneur; Role of Entrepreneur in economic development; theories of entrepreneur, socio, economic, cultural and psychological; entrepreneur traits and behavior, roles in economic growth, employment, social stability, export promotion and indigenization, creating a venture, opportunity analysis competitive and technical factors, sources of fund. Forms of business organizations/ownership - formation of a Company - procedures and formalities for setting up of new industry-sources of information to contact for what and where.
II	**Management:** Importance, definition and functions; dimensions of organizations, size/specialization, behavior formalization, authority centralization, departmentalization, spam and line of control, technology and Minzberg organization typology, line, staff & matrix organization. **Motivation theories**: Maslow, Mc Cullen - Motivation model - need, want, motive and behavior – attitude towards work - self assessment and goal setting - Achievement, motivation and behavior measurement, SWOT analysis and TA analysis - Stress and conflict management; with uncertainty; creativity and innovation.
III	**Marketing:** Importance, definition, core concepts of need want and demand, Project identification and formulation: Sources of information - opportunity guidance - choice of technology and its evaluation; consumer behavior; market survey and research; preliminary project report, detailed project report, assessing viability and feasibility of a report. Exchange &relationships, product value, cost and satisfaction (goods and services) marketing environment; selling, marketing and societal marketing concepts; four P's, product, price, placement, promotion. **Finance:** Nature and scope, forms of business ownerships, balance sheet, profit and loss account, fund flow and cash flow statements, breakeven point (BEP) and financial ratio analysis, pay-back period, NPV and capital budgeting. Subsidies and concessions for SSI - role of State and Central Government Agencies in promotion of Small Scale Industry
IV	**Concept of Property:** Theories of Property, Types of Intellectual Property- Origin and Development, Theories of Intellectual Property Rights, Need for Protecting Intellectual Property, Commercialization of Intellectual Property Rights by Licensing, Determining Financial Value of Intellectual Property Rights, Negotiating Payments Terms in Intellectual Property Transaction
V	**Introduction to Patent Law**, (a) Paris Convention , (b) Patent Cooperation Treaty, (c) WTO- TRIPS , Indian Patent Law, The Patents Act, 1970, Patentable Subject Matter, Patentability Criteria, Procedure for Filing Patent Applications, Patent Granting Procedure, Revocation, Patent Infringement and Remedies, Relevant Provisions of the Biological Diversity Act, 2002, Access and Benefit Sharing Issues

References:

1   Handbook for New Entrepreneurs, EDII, Ahmadabad.
2   Entrepreneurial Development by P.Saravanavel.
3   Environment and Entrepreneur – Tandon B.C. (Asian Publishers, New Delhi)
4   Emerging Trends in Entrepreneurship Development Theories & Practices – Singh P.Narendra Entrepreneurship &
5   Growth of Enterprise in Industrial Estates – Rao Gangadhara N

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Subject Title	Subject Code	Credit			Theory		
Discrete Mathematics	**BT-512**	**L**	**T**	**P**	**External** **(70)**	**Internal** **(30)**	**Total (100)**
		3	1	-			Min:40 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal - Max Marks: 30

Best of Two Mid Semester Test   –Max Marks: 20

Assignment / Quiz   – Max. Marks: 10

Unit	Contents *(Theory)*
I	**Set theory and Relations :** Definition of Sets, countable and uncountable sets, finite and infinite sets, Venn Diagrams, principles of inclusion and exclusion, proofs of some general identities on sets multi-sets and ordered pairs, Relation, Definition, Types of relation, Composition of relations, Equivalence relation, Equivalence class, partial ordering relation and job -scheduling problem.
II	**Functions & Pigeon Hole Principle :** Definition, Domain, Co-Domain and Range of a Function, Image of an Element, Everywhere Defined Function, Equal Function, type of function , Invertible Function, Composition of Functions, Identity Function, Inverse Function, Recursively Defined Function, pigeonhole principle, Theorem proving Techniques, Mathematical induction and proof by contradiction
III	**Prepositional Logic & Finite State Machines :** Proposition, First order logic, Basic logical operations, Truth tables, tautologies, Contradictions, Algebra of prepositions, logical implications, logical equivalence, predicates, normal forms, Universal and existential quantifiers, Introduction to finite state machine and Finite state machines as models of physical system equivalence machines.
IV	**Graph Theory :** Introduction and basic terminology of graphs, planer graphs, Multigraph and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, chromatic numBEr, Somorphism and Homomorphism of graphs
V	**Combinatorics & Recurrence Relations :** Introduction Permutation and combination, Binomial Theorem, Multimonial Coefficients Recurrence Relation and Generating Function, Introduction to Recurrence Relation and Recursive algorithms, Linear recurrence relations with constant coefficients, Homogeneous Solutions, Particular solutions, Total solutions, Generating functions, Solution by method of generating functions

References

1 D.C. Aggarwal "Discrete Mathematics"
2 Lipschutz; Discrete mathematics (Schaum); TMH
3 S k Sarkar " Discrete Mathematics", S. Chand .
4 Discrete Mathematics,Harish Mittal, I.K International Publishing House PVT.LTD
5 Discrete Mathematics, Geetha, Scitech Publication PVT.LTD. Chennai

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Programme: **B. Tech. (Information Technology)**   **Semester -V**

Subject Title	Subject Code	Credit			Theory			Practical		
Analysis and designing of algorithms	**ITT-503**	**L**	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
		3	1	2			Min: 40 (D Grade)			Min:20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal - Max Marks: 30
      Best of Two Mid Semester Test   –Max Marks: 20
      Assignment / Quiz   – Max. Marks: 10

Practical internal - max marks: 15
      Lab performance/Lab Record/Viva   –Max. Marks: 10
      Assignment / Quiz/ Attendance   – Max. Marks: 05

Unit	Contents (*Theory*)
I	**Basic concepts of algorithms:** Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.
II	**Mathematical aspects and analysis of algorithms:** Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching – Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary tree- Traversal and Related Properties – Decrease and Conquer – Insertion Sort – Depth first Search and Breadth First Search. Binary search trees, height balanced trees, 2-3 trees, B-trees, basic search and traversal techniques for trees and graphs (In order, preorder, post order, DFS, BFS), NP-completeness.
III	**Algorithm techniques**: Transform and conquer – Presorting – Balanced Search trees – AVL Trees – Heaps and Heap sort – Dynamic Programming – Warshall's and Floyd's Algorithm – Optimal Binary Search trees – Greedy Techniques – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman trees. **Backtracking concept:** Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem etc.
IV	**Branch and Bound Method**: Introduction to branch & bound method, examples of branch and bound method like traveling salesman problem etc. Meaning of lower bound theory and its use in solving algebraic problem, introduction to parallel algorithms.
V	**Study of Greedy strategy and dynamic programming:** Concept of dynamic programming, problems based on this approach such as 0/1 knapsack, multistage graph, reliability design, Floyd- Warshall algorithm, etc. Study of Greedy strategy ,examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, knapsack problem, job sequencing with deadlines, single source shortest path algorithm, etc.

Reference:

1   G.Booch, Object-Oriented Analysis and Design with Applications, 2nd ed.
2   P.Coad, D.North, & M.Mayfield, Object models: Strategies,Patterns,&Applications,Prentice Hall, Englewood Clffs,NJ,1995.
3   .Popper, Objective Knowledge: An Evolutionary Approach, Clarendon, Oxford B K
4   Horwitz Sahani Computer Algorithms

List of Experiments

1   Write a program for Iterative and Recursive Binary Search.
2   Write a program for Strassen's Matrix Multiplication.
3   Write a program for minimum spanning trees using Prim's algorithm.
4   Write a program for Floyde-Warshal algorithm.
5   Write a program for traveling salesman problem.

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Programme: **B. Tech. (Information Technology)**   **Semester -V**

Subject Title	Subject Code	Credit			Theory			Practical		
Data Base Management system	**BT-514**	**L**	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
		3	1	2			Min: 40 (D Grade)			Min:20 (D Grade)

Duration of Theory (Externals): 3 Hours
Theory Internal - Max Marks: 30
    Best of Two Mid Semester Test   –Max Marks: 20
    Assignment / Quiz   – Max. Marks: 10
Practical internal - max marks: 15
    Lab performance/Lab Record/Viva   –Max. Marks: 10
    Assignment / Quiz/ Attendence   – Max. Marks: 05

Unit	Contents (*Theory*)
I	**Introduction & Basic Models**: DBMS Concepts, architecture & Advantages, Database approach v/s Traditional file accessing approach, Data models, Schemas and instances, Data independence, Data Base Language and interfaces, Functions of DBA and designer, types of database users. Various other data models object oriented data Model, Network data model, and Relational data model, Comparison BEtween the three types of models.
II	**Design**: Introduction to ER modeling, entity, entity sets & types, attributes, relation and relationship sets in ER models, ER diagrams, and reducing ER diagrams to tables, generalization and aggregation in ER models, Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multivalued dependencies.
III	**Relational Data models**: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Relational database, Referential integrity, Intension and Extension, Relational Query languages: SQL-DDL, DML, integrity constraints, Complex queries, various joins, indexing, triggers, assertions, deletion and modification anomalies. Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union and Introduction to Query Optimization
IV	**Data definitions in SQL** Queries, update statements and views in SQL, QUEL and QBE , data and storage definition, data retrieval queries and update statements etc. Methods of storing relational database record in files, various types of files like sequential files, indexed files, indexed sequential files etc. buffer management, data dictionary, physical storage media etc. needed for these file. Introduction to indexing and hashing: indexing techniques using B -Trees, B+ -Trees etc., static hashing function, dynamic hashing function etc, overview of query processing and cost estimation.
V	**Transaction Processing Concepts**: Transaction System, Testing of Serilizability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures. Log based recovery, Concurrency Control Techniques: - Concurrency Control, locking Techniques for concurrency control, time stamping protocols for concurrency control, validation based protocol, multiple granularity. Multi version schemes, Recovery with concurrent transaction. Introduction to Distributed databases, datamining, data warehousing, Object Technology and DBMS, Comparative study of OODBMS Vs DBMS . Temporal, Deductive, Multimedia, Web & Mobile database .Comparison of various database models, comparison of some existing DBMS

References

1   Fundamentals of Database Systems By Elmasri & Navathe
2   Database System Concepts by SilBEerschatz, Korth & Sudershan
3   An introduction to Database Systems By C.J.Date
4   Atul Kahat "Introduction to Database Management System", Pearson Educations.

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List of Experiments

1   Study and Implementation of Create table Command
2   Study and Implementation of Insert Command
3   Study and Implementation of Delete Command
4   Study and Implementation of Drop Table Command
5   Study and Implementation of Alter Table Command
6   Study and Implementation of Update Command
7   Study and Implementation of Select Clause
8   Study and Implementation of From Clause
9   Study and Implementation of Where Clause
10 Delete Duplicate Rows from the Table
11 Query for Join Operation
12 Query for Cartesian Product

Department of Information Technology

PEOPLE'S UNIVERSITY, BHOPAL

Programme: **B. Tech. (Information Technology)**   **Semester -V**

Subject Title	Subject Code	Credit			Theory			Practical		
Principles of programming languages	**ITT-505**	**L**	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
		3	1	2			Min: 40 (D Grade)			Min:20 (D Grade)

Duration of Theory (Externals): 3 Hours
Theory Internal - Max Marks: 30
        Best of Two Mid Semester Test   –Max Marks: 20
        Assignment / Quiz   – Max. Marks: 10
Practical internal - max marks: 15
        Lab performance/Lab Record/Viva   –Max. Marks: 10
        Assignment / Quiz/ Attendance   – Max. Marks: 05

Unit	Contents *(Theory)*
I	**Introduction:** Characteristics of programming Languages, Factors influencing the evolution of programming language, developments in programming methodologies, desirable features and design issues. Programming language processors: Structure and operations of translators, software simulated computer, syntax, semantics, structure, virtual computers, binding and binding time.
II	**Elementary and Structured Data Types:** Data object variables, constants, data types, elementary data types, declaration, assignment and initialization, enumeration, characters, strings. Structured data type and objects: Specification of data structured types, vectors and arrays, records, variable size data structure, pointers and programmer constructed data structure, Sets files. Sub Program and programmer defined data types: Evolution of data types, abstractions, encapsulations, information hiding, sub programmes, abstract data types.
III	**Controls:**Sequence Control; Implicit and Explicit sequence control, sequence control with within expression and statements, recursive sub programmes, exception handling, co routines, Scheduled sub programmes, concurrent execution. Data control referencing environments, static and dynamic scope, local data local data referencing environment, shared data: Explicit common environment dynamic scope parameter passing mechanism.
IV	**Storage Management:**Major run time requirements, storage management phases, static storage management, stack based, heap based storage management. Syntax and translation: General syntactic criteria, syntactic element of a language, stages in translation, formal syntax and semantics.
V	**Operating and Programming Environment:**Batch Processing Environments, Embedded system requirements, Theoretical models, Introduction to Functional Programming, Lambda calculus, Data flow language and Object Oriented language, Comparison in various general and special purpose programming languages e.g. Fortran, C, Pascal, Lisp, etc.

Reference:

1   Terrance W Pratt, "Programming Languages: Design and Implementation" PHI
2   Sebesta, "Concept of Programming Language", Addison Wesley
3   E Horowitz, "Programming Languages", 2nd Edition, Addison Wesley
4   "Fundamentals of Programming Languages", Galgotia.

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List of Experiments

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 Polymorphism using function overloading
9. Program to implement Generic Polymorphism using Templates
10. Program to implement Dynamic Memory Allocation using "new" and "delete" Operators

Department of Information Technology

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Programme: **B. Tech. (Information Technology)**　　　　　　　　**Semester -V**

Subject Title	Subject Code	Credit			Practical		
PHP Lab	**ITT-506**	**L**	**T**	**P**	**External (35)**	**Internal (15)**	**Total (50)**
		-	-	2			Min: 20 (D Grade)

Practical internal - max marks: 15
　　　　Lab work & sessional　　　　　　　　　　　　　　　　– Max. Marks: 10
　　　　Assignment / Quiz/ Regularity　　　　　　　　　　– Max. Marks: 05

Unit	Contents *(Practical)*
I	**Introduction:** Introduction- open source-PHP – history- features-variables- statements operators-conditional statements-if-switch-nesting conditions-merging forms with conditional statements-loops-while-do-for – loop iteration with break and continue.
II	**Function and String:** Defining and calling a function Default parameters Variable parameters, Missing parameters Variable function, Anonymous function Types of strings in PHP Printing functions Encoding and escaping, Comparing strings Manipulating and searching strings Regular expressions.
III	**Arrays :** Indexed Vs Associative arrays Identifying elements of an array Storing data in arrays Multidimensional arrays Extracting multiple values Converting between arrays and variables Traversing arrays Sorting Action on entire arrays Using arrays.
IV	**Web Techniques:** Variables, Server information, Processing forms, Setting , headers Maintaining state SSL.
V	**Files and directories:** Working with files and directories Opening and Closing, Getting information about file, Read/write to file, Splitting name and path from file, Rename and delete files Reading and writing characters in file Reading entire file Random access to file data Getting information on file Ownership and permissions.

References

1. Programming PHP Rasmus Lerdorf and Kevin Tatroe O'Reilly publication
2. Beginning PHP 5 Wrox publication
3. PHP web sevices Wrox publication
4. AJAX Black Book Kogent solution

List of Experiments

1. Design a PHP page using all the basic tags.
2. Design a page containing your educational qualification in a table.
3. Design a page containing an ordered list/unordered list.
4. Design a PHP page for your resume.
5. Design a form in PHP to enter different attribute of Employee information.
6. Design a home page for ASE using Frame
7. Design another page and connect these to the home page.
8. Write a procedure for data base connectivity in PHP with my SQL
9. Design a Performing dynamic functions using My SQL.

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Subject Title	Subject Code	Credit			Practical		
		L	**T**	**P**	**External** **(Nil)**	**Internal** **(50)**	**Total (50)**
Programming Lab -1	**BT-517**	-	-	2			Min: 20 (D Grade)

Practical internal - max marks: 50

Lab work & sessional – Max Marks: 25
Assignment / Quiz/ Regularity – Max. Marks: 25

Unit	Contents (*Practical*)
I	Overview of Internet Introduction to Internet and WWW, Concept of Networking and Layers of OSI Model, Internet protocols like TCP/IP, http, telnet and ftp, URL, email, domain name, Web Browsers.
II	Principles of Web Design Key issues to be considered in web site design. Structure of a Web Page: Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, HTML Editors & Tools: Use of different HTML editors and tools like Netscape Communicator and Microsoft Front Page etc
III	HTML Tags Use of Different HTML tags in web pages. Table Handling: Table layout & presentation, constructing tables in a web page, developing a web page in a table. Ordered and unordered lists. Frames: Developing Web pages using frames. Advantages and disadvantages of frames. Creating forms, Role of Databases in web applications. Use of Different graphical and animation tools like Abode Photoshop, Gif Animator etc
IV	Introduction to Java Script/VBScript Role of java script in a web page, Script writing basics, Adding interactivity to a web page, creating dynamic web pages, Similarities to java, embedding JavaScript code, embedding java applets in a web page Form validation using java script
V	Introduction to ASP Role of ASP in a web page, working of Active server pages, configure IIS, embedding ASP code in a Web page, Integrating objects and components into active server pages, working with forms, connectivity with database, maximizing ASP pages performances Security: Concept of various methods of Internet security like firewalls etc

References

1 Rick Dranell, ―HTML4 unleashed‖, Techmedia Publication
2 Shelly Powers, ―Dynamic Web Publishing Unleashed‖, Techmedia
3 Don Gosselin, ―JavaScript‖, Vikas Publication
4 Mark Swank & Drew Kittel, ―World Wide Web Database‖, Sams net

List of Experiments

1 Design a HTML page using all the basic tags
2 Design a page containing your educational qualification in a table.
3 Design a page containing an ordered list/unordered list.
4 Design a HTML page for your resume.
5 Design a form in HTML to enter different attribute of student information.
6 Design a home page for ASE using Frame.
7 Design another page and connect these to the home page.
8 Write a function in Javascript for input validation.
9 Write a function in Javascript to calculate monthly installation of the loan.
10 Write an input form and save its data in a database using ASP.
11 Display the data stored in database in tabular form on the page

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Subject Title	Subject Code	Credits			Practical		
		L	**T**	**P**	**External** (Nil)	**Internal** **(50)**	**Total (50)**
Industrial Training- I	**ITT-508**	-	-	2			Min: 20 (D Grade)

Practical Internal - Max Marks: 50

Assignment /Quiz   – Max Marks: 50

Duration: 2 weeks after the IV semester in the summer break. Assessment in V semester.

Marks of various components in industry should be awarded to the student, in consultation with the Training and Placement Officer (TPO)/ Faculty of the institute, who must establish contact with the supervisor/ authorities of the organization where, students have taken training, to award the marks for term work. During training, students will prepare a first draft of the training report in consultation with the section in charge. After training they will prepare final draft with the help of the TPO/ faculty of the institute. Then, they will present a seminar on their training and will face viva-voce on training in the institute.