PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credits			Theory		
		L	T	P	Externals (70)	Internals (30)	Total (100)
IT Enabled services, Ethics and Management	ITT-601	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	**Business Strategy Challenges and Opportunities for IT:** Business Strategy: Challenges and Opportunities in the Globalized, Interconnected, Convergent World, Establish Principles before Practice, IT Strategy, Application Strategy, Technology Strategy for IT, IT Management Strategy, Developing IT Strategy for Competitive Advantage, Stages of IT Strategy Development and Implementation, Challenges of IT and Business Strategy Alignment, Inhibitors of Business and IT Strategy Alignment, Three-D Framework for Business and IT Strategy Alignment.
II	**Strategic IT Planning:** Business Implications for IT Strategic and Planning, Strategic IT Planning Motivations, SITP Process: Prevalent Planning Approaches, Difficulties in Developing and Executing SITP, Best Practices for Achieving Good SITP, SITP Approaches: Prevalent Researches, Defining EITA, Contents of a Typical Enterprise IT Architecture, Standard for Enterprise IT Architecture, Technology Management strategy Framework, Prevalent Technology Reference Architectures Framework and Standards, Program Management, Benefits of PMO, Desired Qualities of a Program Office Manager, Maturity of PMO, Implementation of PMO Strategy, Measuring PMO Performance, Success Factors for PMO, Project Scope Management, PMO Dashboard and Reporting.
III	**Service Management Strategy:** Information Technology Infrastructure Library (ITIL), ITIL Overview, ITIL Service Support Processes, Incident Management, Problem Management, Service Delivery, Service Level Management, Financial Management, Capacity Management, IT Service Continuity Management (ITSCM), Availability Management, Imperatives for Outsourcing, IT Management Layers, Variants of Outsourcing, Business Process Outsourcing, In sourcing.
IV	**Copyright and IPR:** Understanding the concepts of Copyright, Intellectual Property Law, Patents, Indian Standards Institution and its role Indian copyright law of 1957 and its most important amendment from a software viewpoint, Understanding Intellectual property, Caution with Internet , Email Etiquette, Spamming, Broadcasting.
V	**IT Ethics:** Theoretical basis of Computer Ethics, defining Computer Ethics, computer professional's behavior, and social conduct, do and don'ts with proprietary data, Understanding computer crime, Social Networking, Understanding Software Compliance, Software Piracy, Understanding Professional Responsibility.

References:

1 IT strategy and Management by Sanjiva Shankar Dubey, PHI
2 Marketing of Information Technology, by K.Venkatesh, TMH

PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credit			Theory		
		L	T	P	External (70)	Internal (30)	Total (100)
System Programming & Operating System	ITT-602	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	**Introduction of System Programming:** Introduction Language Processors, Elements of assembly level programming Language Processing Activities and Language Processors Development Tools, Assemblers, Design of assembler, Macro definition, Design of Macro preprocessor, Relocating and linking concepts , Design of linker , Programming Environments , Compiler, Aspects of Compilation.
II	**Introduction of OS:** Introduction to Operating Systems, Types of operating Systems & Services. Basic concepts of CPU scheduling, scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling. Process concept, operations on processes, threads, inter process communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization, Disk scheduling
III	**Deadlock:** Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling. Concepts of memory management, logical and physical address space, swapping, Fixed and Dynamic Partitions, Best-Fit, First-Fit and Worst Fit Allocation, paging, segmentation, and paging combined with segmentation.
IV	**Virtual Memory:** Concepts of virtual memory, Cache Memory Organization, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation, File concepts, File manager, File organization, access methods, allocation methods, free space managements, directory systems, file protection, file organization & access mechanism, file sharing implement issue
V	**Distributed Operating System:** Introduction to distributed systems, Design Issues in distributed operating system, Networking Issues, Communication Protocols, Message Passing, RPC in heterogeneous environment, Resource allocation, Algorithms for Distributed control .Distributed Deadlock detection, Mechanism for building Distributed File System, Distributed shared memory and distributed scheduling. Case studies: UNIX Operating system, Amoeba, Andrew.

References

1 Marketing of Information Technology, by K.Venkatesh, TMH
2 Sinha , Distributed operating system , PHI
3 Silberschatz,"Operating system", Willey Pub.
4 Silberschatz,"Operating system", Willey Pub.

PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
Compiler Design and computation	ITT-603	3	1	2	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	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:** Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), Equivalence of NFA and DFA, Minimization of Finite Automata, Regular Expressions, Arden's theorem.
II	**Definition of PDA**: Deterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a given PDA. The pumping lemma for CFL's **Turing Machines:** Introduction, TM model, representation and languages acceptability of TM Design of TM, Universal TM & Other modification, composite & iterated TM. A language that is not Recursively Enumerable (RE) – An undecidable problem that is RE – Undecidable problems about Turing Machine.
III	**Compiler Structure**: Compilers and Translators, Various Phases of Compiler, Pass Structure of Compiler, Bootstrapping of Compiler. Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.
IV	**Bottom–up Parsers:** Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.
V	**Run Time Memory Management:** Issues in the design of a code generator- The target machine-Run-time storage management-Basic blocks and flow graphs- Next-use information-A simple code generator-Register allocation and assignment-The dag representation of basic blocks - Generating code from dags.

Reference:

1. Louden, "Compiler construction", Cengage learning
2. Alfred V Aho, Jeffrey D. Ullman, "Principles of Compiler Design", Narosa
3. A.V. Aho , R. Sethi and J.D Ullman, "Compiler: principle, Techniques and Tools", AW.
4. Michal Sipser, "Theory of Computation", Cengage learning.
5. Michal Sipser, "Theory of Computation", Cengage learning.

List of Experiments

1. Program to implement a DFA that accepts all Strings of 'a' and 'b' ending with 'abb'
2. Program to implement a DFA that accepts all Strings of 'a' and 'b' having equal numBEr of 'a' and 'b'.
3. Program to implement Lexical Analyzer
4. Program to implement LL(1) Parser
5. Program to implement Recursive Descent Parser
6. Program to implement Operator Precedence Parser
7. Program to generate Intermediate Code as Postfix Notation
8. Program to generate Intermediate Code as Three Address Code

PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
Computer Network	BT-614	3	1	2	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	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 & Protocol Layering:** Introduction to Computer Networks, Elements of Computer Networks, Applications, Types, LAN, WAN, MAN, Internet, internet, Intranet, Extranet, Introduction to Protocol Layering Principle, OSI Model, Functions of 7 Layers, TCP / IP Protocol Suite, SNA, Internetworking and Internetworking Devices
II	**Data Link Layer & Ethernet:** Introduction to DLL, LLC & MAC Sub Layers, Introduction to Physical Addressing, SLIP, PPP, HDLC, Bit Oriented & Byte Oriented Protocols, Introduction to ALOHA, Pure ALOHA, Slotted ALOHA, CSMA, Types, CSMA/CD, CSMA/CA, Introduction to IEEE 802 Project, Token Bus, Token Ring, FDDI, DQDB and Ethernet, Introduction to Spread Spectrum and its Types
III	**Network Layer & Addressing:** Introduction to Addressing, Addressing Classes, Classless Addressing, Introduction to Subnetting and Supernetting, Connectionless & Connection Oriented Services, Introduction to Routing, Types, Routing Protocols, RIP, OSPF, BGP, IP, ICMP, ICMP Messages, IGMP, ARP and RARP
IV	**Transport Layer & Application Layer:** Introduction to Port Addressing, UDP, TCP, 3 Way Handshaking for TCP Connection Management, Types of TCP Connections, Introduction to BOTP, DHCP, DNS, TELNET, FTP, TFTP, Introduction to Mail Transfer, SMTP, Message Access Agents, SNMP, SMI, MIB, HTTP, NNTP and Remote Procedure Call
V	**Security & Management:** Introduction to Encryption and Decryption, Symmetric Key Cryptography, Classical Encryption Techniques, DES Algorithm, Public/Private Key Cryptography, RSA Algorithm, Digital Signatures, Firewalls, Attacks, Intruders, Malicious Softwares and Antivirus Softwares, Introduction to Network Management, Fault Management, Configuration Management, Accounting Management, Performance Management, Security Management and Introduction to Network Monitoring

References

1. Computer Networks by WilliamStallings
2. Computer Networking by Sanjay Sharma
3. Implementation of TCP/IP Protocol Suite by Douglas E. Comer
4. Fundamental of Computer Network by Chandra Mohan, I.K International Publishing House PVT.LTD,
5. Data Communication and Networking by Asish Tiwari, Kamal Prakashan,Indore
6. Data Communication & Networking by BEhrouz Forouzan, Tata Mc Graw Hill Publications
7. TCP/IP Protocol Suite by BEhrouz Forouzan, Tata Mc Graw Hill Publications
8. TCP/IP Protocol Suite by Steven Richards

PEOPLE'S UNIVERSITY, BHOPAL

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

List of Experiments

1. Write a program in 'C' for PC to PC communication using RS-232 port.
2. Write a program for encryption and decryption using monoalphaBEtic substitution or polyalphaBEtic substitution.
3. Write a program to implement Huffman data compression algorithm to generate Prefix codes and encoded text.
4. Study of Novell Netware.
5. Study and implementation of routing algorithm
6. Study and implementation of congestion control algorithm.
7. Implementation of subnet mask concept.
8. Simulation of ARP and RARP protocols.
9. Simulation of TCP protocol.
10. Network socket programming.

PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credit			Theory			Practical		
		L	T	P	External	Internal	Total (100)	External	Internal	Total (50)
Computer Graphics & Multimedia	ITT-605	3	1	2	(70)	(30)	Min: 40 (D Grade)	(35)	(15)	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:** Introduction to computer graphics & graphics system, representing pictures, preparing, presenting & interacting with pictures for Presentations, storage tube graphics display, Raster scan display, 3D viewing devices, Plotters, printers, digitizers, Light pens etc.; Active & Passive graphics devices; Computer graphics software. Scan conversion: Points & lines, Line drawing algorithms; DDA algorithm, Bresenham's line algorithm, Circle generation algorithm, scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.
II	**Transformation:**2D transformation & viewing: Basic transformations: translation , rotation, scaling ; Matrix representations & homogeneous coordinates, transformations between coordinate systems; reflection ,shear; Transformation of points, lines , parallel lines, intersecting lines. Viewing pipeline, Window to viewport co-ordinate transformation, clipping operations, point clipping, line clipping, clipping circles, polygons & ellipse.
III	**3D Transformation:** 3D transformation & viewing: 3D transformations: translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane; general parallel & perspective projection transformation; clipping, viewport clipping, 3D viewing.
IV	**Curves:** Curve representation, surfaces, designs, Bezier curves, B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves. Hidden surfaces :Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Printer's algorithm, scan-line algorithm; Hidden line elimination, wire frame methods , fractal - geometry. Color & shading models: Light & color models, shading, interpolative shading model.
V	**Multimedia:** Introduction to Multimedia: Concepts, uses of multimedia, multimedia System Architecture ,evolving technologies, multimedia Data interface standards, multimedia databases, multimedia components, Multimedia hardware and tools, multimedia Data & File Format standards:-TIFF, MIDI, JPEG, DIB, MPEG, RTF, etc. Image, video and audio standards, Audio & video compression, Animation: types, techniques, key frame animation, utility, morphing; Virtual Reality concepts.

References

1 Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson

2 Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI Learning,

3 Folay Vandam, Feiner, Hughes "Computer Graphics Principle & Practice", Pearson Pub.

4 Tay Vaughan, "Multimedia making it works", Tata McGraw Hill edition.

5 Sinha & Udai, "Computer Graphics", McGraw Hill publication.

PEOPLE'S UNIVERSITY, BHOPAL

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

List of Experiments

1 Introduction on Graphics Programming and Graphics Functions

2 Program to Implement a Line Using Slop Intercept Formula.

3 Program to Implement Line Using simple DDA Algorithm

4 study & co Program to Implement Line Using simple DDA Algorithm

5 Program to Implement Line Using simple DDA Algorithm

PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credits			Practical		
		L	T	P	External	Internal	Total (50)
Professional Skills –III	BT- 606	0	0	2	(Nil)	(50)	Min: 20 (D Grade)

Practical Internal - Max Marks: 50

Lab Performance, Lab Record & Viva –Max Marks: 45
Assignment / Quiz – Max. Marks: 05

Contents (Practical)

Group discussion

Introduction to group discussion, structure and dynamics; Techniques of effective participation in group discussion; Preparing for group discussion; Ways to carry out group discussion,

Parameters— Contact, body language, analytical and logical thinking, decision making

Interview Technique

Necessity, How to prepare for interviews; Language and style to be used in interview; Types of interview questions and how to answer them; Tips for handling common questions.

PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credits			Practical		
		L	T	P	External	Internal	Total (50)
Research Methodology	BT- 607	0	0	2	(Nil)	(50)	Min: 20 (D Grade)

Practical Internal - Max Marks: 50

Lab Performance, Lab Record & Viva –Max Marks: 45

Assignment / Quiz – Max. Marks: 05

Unit	Contents *(Practical)*
I	**Objectives and types of research:** Motivation and objectives – Research methods *vs* Methodology. Types of research – Descriptive *vs*. Analytical, Applied *vs*. Fundamental, Quantitative *vs*. Qualitative, Conceptual *vs*. Empirical.
II	**Research Formulation** – Defining and formulating the research problem - Selecting the problem - Necessity of defining the problem - Importance of literature review in defining a problem.
III	**Research design and methods** – Research design – Basic Principles- Need of research design — Features of good design – Important concepts relating to research design – Observation and Facts. Developing a research plan - Exploration, Description, Diagnosis, and Experimentation.
IV	**Data Collection and analysis:** Execution of the research - Observation and Collection of data - Methods of data collection – Sampling Methods- Data Processing and Analysis strategies - Data Analysis with Statistical Packages - Hypothesis-testing - Generalization and Interpretation.
V	**Reporting and thesis writing** – Structure and components of scientific reports - Types of report – Technical reports and thesis – Significance – Different steps in the preparation – Layout, structure and Language of typical reports – Illustrations and tables - Bibliography, referencing and footnotes.

References:

1. Garg, B.L., Karadia, R., Agarwal, F. and Agarwal, U.K., 2002. *An introduction to Research Methodology*, RBSA Publishers.
2. Kothari, C.R., 1990. *Research Methodology: Methods and Techniques*. New Age International. 418p.
3. Sinha, S.C. and Dhiman, A.K., 2002. *Research Methodology*, Ess Ess Publications. 2 volumes.
4. Trochim, W.M.K., 2005. *Research Methods: the concise knowledge base*, Atomic Dog Publishing. 270p.
5. Wadehra, B.L. 2000. *Law relating to patents, trade marks, copyright designs and geographical indications*. Universal Law Publishing.

PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credits			Practical		
		L	T	P	External (35)	Internal (15)	Total (50)
Programming Lab-II	BT-618	-	-	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 to .NET technologies Features of .NET, .NET Framework, CLR, MSIL, .NET class library, .NET Languages, CTS, assemblies, manifest, and metadata, What is ASP.NET?, Difference between ASP and ASP.NET.
II	Controls in ASP.NET Overview of Dynamic Web page, Understanding ASP.NET Controls, Applications, Web servers, Installation of IIS. Web forms, web form controls -server controls, client controls. Adding controls to a web form, Buttons, Text Box, Labels, Checkbox, Radio Buttons, List Box. Adding controls at runtime. Running a web Application, creating a multiform web project. Form Validation: Client side validation, server Side validation, validation Controls: Required Field Comparison Range. Calendar control, Ad rotator Control, Internet Explorer Control.
III	Overview of ADO.NET and XML What is ADO.NET, from ADO to ADO.NET. ADO.NET architecture, Accessing Data using Data A dapters and Datasets, using Command & Data Reader, binding data to data bind Controls, displaying data in data grid , XML basics, attributes, fundamental XML classes: Document, text writer, text reader. XML validations, XML in ADO.NET, The XML Data Document.
IV	ASP.NET Applications Creating, tracking, caching, error handling, Securing ASP.NET applications- form based applications, window based application.
V	Web services Introduction, State management- View state, Session state, Application state, Building ASP.NET web services, working with ASP.NET applications, creating custom controls

References

1 ASP.NET Unleashed by Stephen Walther, SAMS publications.
2 ASP.NET, Wrox Publications.
3 ASP.NET and VB.NET, Wrox Publication.