PEOPLE'S UNIVERSITY, BHOPAL

PROGRAMME: B.TECH (IT) **SEM: IV**

Subject Title	Subject Code	Credits			Theory		
		L	**T**	**P**	**Externals (70)**	**Internals (30)**	**Total (100)**
Engineering Mathematics-III	**BT 401**	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: 20
Assignment / Attendance – Max. Marks: 10

Unit	Contents *(Theory)*
I	**Function of Complex variable:**Analytic function, C-R equations, Cauchy's integral theorem, Cauchy's integral formula for derivatives of analytic function, Taylor's and Laurent's series, singularities, Residue theorem, Evaluation of real integrals of the type and
II	**Statistical Techniques - I** :Moments, Moment generating functions, Skewness, Kurtosis, Curve fitting, Method of least squares, fitting of straight lines, Polynomials, Exponential curves etc., Correlation, Linear, non –linear and multiple regression analysis, Probability theory.
III	**Statistical Techniques - II** :Binomial, Poisson and Normal distributions, Sampling theory (small and large), Tests of significations: Chi-square test, t-test, Analysis of variance (one way) , Application to engineering, medicine, agriculture etc. Time series and forecasting (moving and semi-averages), Statistical quality control methods, Control charts, , R, p, np, and c charts.
IV	**Numerical Techniques – I** :Zeroes of transcendental and polynomial equation using Bisection method, Regula-falsi method and Newton-Raphson method, Rate of convergence of above methods. Interpolation: Finite differences, difference tables, Newton's forward and backward interpolation, Lagrange's and Newton's divided difference formula for unequal intervals.
V	**Numerical Techniques II** :Solution of system of linear equations, Gauss- Serial method, Crout method. Numerical differentiation, Numerical integration , Trapezoidal , Simpson's one third and three-eight rules, Solution of ordinary differential (first order, second order and simultaneous) equations by Euler's, Picard's and forth-order Runge- Kutta methods.

REFERENCE:

1. R.K. Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publication House, 2002.
2. Chandrika Prasad, Advanced Mathematics for Engineers, Prasad Mudralaya,1996.
3. E. Kreysig, Advanced Engineering Mathematics, John Wiley & Sons, 2005.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 2005.
5. Devi Prasad, An introduction to Numerical Analysis, Narosa Publication house, New Delhi 2006.

PEOPLE'S UNIVERSITY, BHOPAL

PROGRAMME: B. Tech. (IT) **SEM: IV**

Subject Title	Subject Code	Credits			Theory		
		L	T	P	Externals (70)	Internals (30)	Total (100)
Computer System Organization	**BT 412**	3	1	2	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: 20
Assignment / Attendance – Max. Marks: 10

Unit	Contents *(Theory)*
I	Computer Basics and CPU Von Newman model, various subsystems, CPU, bus organization, computer memory, Memory registers, I/O, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer, Flynn's and Handler's Classification of parallel computing structures.
II	Control Unit, Organization, Hardwired control unit, Micro and nano programmed control unit, Control Memory, Address Sequencing, Micro Operations & Instruction formats, horizontal and vertical micro instruction, Micro program sequencer, Data and control hazards and method to resolve them, Arithmetic and Logic Unit, Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units and design of arithmetic unit.
III	Input Output Organization & Modes Of Data Transfer Program controlled, interrupt driven & direct memory access, I/O Interface, programmed I/O, I/O addressing & instruction, I/O processor, I/O Synchronization, I/O processors, DMA, Data transfer – Serial / parallel, synchronous / asynchronous, simplex / half duplex and full duplex, Interconnection networks, Parallel Algorithms for array processors and Search algorithms
IV	Memory & 8085 Microprocessor Memory Hierarchy, Cache Memory - Organization and mappings, Associative memory, Virtual memory, semiconductor memories (RAM, ROM), memory allocation and management policies, 8085 I/O structure, Assembly Language, instruction set and basic programming and Data communication.
V	Multiprocessors Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication structure of multiprocessors, parallel processing and pipeline processing, SIMD & MIMD multiprocessor

TEXT BOOKS:

1. Morris Mano: Computer System Architecture, PHI.
2. Advanced Computer Architecture: A System Design Approach- Kain, PHI Publication.
3. Computer Architecture and Parallel Processing- Hwang And Briggs, TMH.
4. Tanenbaum: Structured Computer Organization, Pearson Education

References

1. Gaonkar: Microprocessor Architecture, Programming, Applications with 8085; Penram Int.
2. William Stallings: Computer Organization and Architecture, PHI
3. K.M.HebBTr: Computer Architecture, Macmillan Publishers India LTD
4. J P Hayes, Computer Architecture and Organisations, Mc- Graw Hills, New Delhi

Subject Title	Subject Code	Credits	Practical		
Computer Organization & Architecture	**BT 412**	**P**	**Externals (35)**	**Internals (15)**	**Total (50)**
		2	Min: 12 (D Grade)	Min: Nil	Min: 20 (D Grade)

Practical Internal - Max Marks: 15

Lab Performa, Lab Record & Viva –Max Marks: 10
Assignment – Max. Marks: 05

PRACTICALS:

Suggested list of experiments (expandable)

1. Program in Assembly Language for Addition and Subtraction of 2 NumBErs.
2. Program in Assembly Language for Multiplication and Division of 2 NumBErs.
3. Program in Assembly Language for Addition of 2 Hexadecimal NumBErs
4. Program in Assembly Language for Addition of 2 Four Bit Binary NumBErs
5. Program in Assembly Language for Multiplication of 2 Four Bit Binary NumBErs
6. Program in Assembly Language for Division of 2 Four Bit Binary NumBErs
7. Program to implement Booth's Algorithm
8. Program to implement Interrupt Processing Techniques

PEOPLE'S UNIVERSITY, BHOPAL

PROGRAMME: B.TECH (IT) **SEM: IV**

Subject Title	Subject Code	Credits			Theory			Practical		
		L	T	P	Externals (70)	Internals (30)	Total (100)	Externals (35)	Internals (15)	Total (50)
Information Theory and Coding	ITT-403	3	1	2	Min: 28 (D Grade)	Min: Nil	Min: 40 (D Grade)	Min: 12 (D Grade)	Min: Nil	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 Performa, Lab Record & Viva –Max Marks: 10
Assignment – Max. Marks: 05

Unit	Contents *(Theory)*
I	**Information Theory, Probability and Channel:** Introduction, Information Measures, Review probability theory, Random variables, Processes, Mutual Information, Entropy, Uncertainty, Shannon's theorem, redundancy, Huffman Coding, Discrete random Variable. Gaussian random variables, Bounds on tail probabilities.
II	**Error Control Coding**: Introduction, Matrix description, Decoding, Equivalent codes, Parity check matrix, Syndrome decoding, Perfect codes Hamming Codes Optimal linear codes, Maximum distance separable (MDS) codes.
III	**Linear Block Codes** **Cyclic Codes:** Introduction, generation, Polynomials, division algorithm, Matrix description of cyclic codes, burst error correction, Fire Codes, Golay Codes, and CRC Codes. **BCH Codes:** Introduction, Primitive elements, Minimal polynomials, Generator Polynomials in terms of Minimal Polynomials, Decoding of BCH codes.
IV	**Coding for Secure Communications:** Review of Cryptography, Introduction, Encryption techniques and algorithms, DES, IDEA , RC Ciphers RSA Algorithm, Diffi-Hellman, PGP, Chaos Functions, Cryptanalysis, Perfect security, Unicity distance, Diffusion and confusion, McEliece Cryptosystem.
V	**Stochastic Processes:** Statistical independence, Bernoulli Process, Poisson Process, Renewal Process, Random Incidence, Markov Modulated Bernoulli Process, Irreducible Finite Chains with Aperiodic States, Discrete-Time Birth-Death Processes, Markov property, Finite Markov Chains, Continuous time Markov chain, Hidden Markov Model.

REFERENCE BOOKS:

1. Rajan Bose "Information Theory, Coding and Cryptography", TMH, 2002.
2. Kishor S. Trivedi "Probability and Statistics with Reliability, Queuing and Computer Science Applications", Wiley India, Second Edition.
3. J.C.Moreira, P.G. Farrell "Essentials of Error-Control Coding", Willey Student Edition
4. San Ling and Chaoping "Coding Theory: A first Course", Cambridge University Press, 2004.
5. G A Jones J M Jones, "Information and Coding Theory", Springer Verlag, 2004.

PEOPLE'S UNIVERSITY, BHOPAL

PROGRAMME: B.TECH (IT) **SEM: IV**

Subject Title	Subject Code	Credits			Theory			Practical		
		L	T	P	Externals (70)	Internals (30)	Total (100)	Externals (35)	Internals (15)	Total (50)
Analog & Digital Communication	ITT-404	3	1	2	Min: 28 (D Grade)	Min: Nil	Min: 40 (D Grade)	Min: 12 (D Grade)	Min: Nil	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 Performa, Lab Record & Viva –Max Marks: 10
Assignment – Max. Marks: 05

Unit	Contents *(Theory)*
I	Special Diodes- LED, Varactor diode, Photo diode, Schottky diode, Tunnel diode; their characteristics and applications. Transistors as a switch.
II	Frequency Response: Amplifier transfer function, low and high frequency response of common emitter and common source amplifiers. Feedback: General feedback structure; properties of negative feedback; series-series, series-shunt, shuntseries and shunt-shunt feedback amplifiers.
III	Basic principle of sinusoidal oscillator, R-C Phase Shift and Wein Bridge oscillators, tuned oscillators-Collpits and Hartley; Crystal oscillator
IV	Combinational Logic Circuits: Multiplexers/Demultiplexures, Encoders/Decoders. Sequential Logic Circuits: latches, flip-flops- S-R, T, D, J-K. Shift Registers: Basic principle, serial and parallel data transfer, shift left/right registers, universal shift register. Counters: Mode N Counters, ripple counters, synchronous counters, ring/Johnson counters.
V	OP-AMP applications - Astable, Monostable and Bistable Multivibrators, Schmitt trigger, IC- 555 Timer, A/D and D/A converters. Voltage Regulators: Series, shunt and switching regulators, op-amp based configurations. Memories: Introduction to ROM, RAM; Sequential Memory, Memory organization.

REFERENCE BOOKS:

1. Taub & Schilling "Digital Electronics"- Tata Mc Graw Hill
2. Anil K. Maini, "Digital Electronics: Principles and Integrated circuits" Wiley India
3. Ltd,
4. Millman, J. and Grabel A, "Microelectronics" Mc Graw Hill
5. Anand Kumar, "Switching Theory and Logic Design" Prentice Hall of India, 2008.

PEOPLE'S UNIVERSITY, BHOPAL

PROGRAMME: B.TECH (IT) **SEM: IV**

Subject Title	Subject Code	Credits			Theory			Practical		
		L	T	P	Externals (70)	Internals (30)	Total (100)	Externals (35)	Internals (15)	Total (50)
Introduction to Java Programming	ITT-405	3	1	2	Min: 28 (D Grade)	Min: Nil	Min: 40 (D Grade)	Min: 12 (D Grade)	Min: Nil	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 Performa, Lab Record & Viva –Max Marks: 10
Assignment – Max. Marks: 05

Unit	Contents *(Theory)*
I	**The Java Environment:** Java Development Kit (JDK), Java virtual machine, Java programming environment (Compiler, interpreter, applet viewer, debugger), Java Applications Programming Interface (API), Basic idea of application and applet. Java as an object oriented language: objects, classes, encapsulation, inheritance, and software reuse, Polymorphism, abstract classes and abstract methods, defining an interface, implementing & applying Interfaces, variables in interfaces, extending interfaces, Packages, scope and lifetime; Access specifies; Constructors; Copy constructor; this pointer; finalize () method; arrays; Memory allocation and garbage collection.
II	**AWT:** Containers and components, AWT classes, window fundamentals Component, Container, Panel Window, Frame, Canvas, AWT Controls, Layout Managers and Menus: adding and removing control, Labels, Button, Check Box, Radio Button, Choice ,menu, Text area, Scroll list, Scroll bar, Frame, Layout managers- flow layout, Grid layout, Border layout, Card layout
III	**Java Event Handling Model** :Java's event delegation model – Ignoring the event, Self contained events, Delegating events; The event class hierarchy; The relationship between interface, methods called, parameters and event source; Adapter classes; Event classes action Event, Adjustment Event, Container Event, Focus Event, Item Event, Eye Event, Mouse Event, Text Event, Window Event. **Applets:** :Applet security restrictions; the class hierarchy for applets; Life cycle of applet; HTML Tags for Applet. **Introduction to Swing:**:Swing library, Building applications using Swings
IV	**Multithreading and Exception Handling:** Overview of simple threads, Basic idea of multithreaded programming, Thread synchronization: Locks, synchronized methods, synchronized block, Thread scheduling, Producer-consumer relationship, Daemon thread, Basic idea of exception handling, stack based execution and exception propagation, Exception types, Exception Handling: Try, Catch, Finally ,Throw statement, Assertions
V	**Input/output:**Exploring Java I/O., Directories, stream classes The Byte stream : Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization. JDBC: JDBC-ODBC Bridge; The connectivity model; the driver manager; navigating the result set Object contents; java.sql Package; The JDBC exception classes; Connecting to Remote database , MIDI, processing sound, sampling, compression. Video: Avi, 3GP,MOV, MPEG , compression standards, compression through spatial and temporal redundancy. Multimedia Authoring .

REFERENCE:

1. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill
2. Deitel "Java- How to Program:" Pearson Education, Asia
3. Horstmann & Cornell "Core Java 2" (Vol I & II) , Sun Microsystems
4. lvan Bayross "Java 2.0" : BPB publications

PRACTICALS:

Suggested list of experiments(expandable):

1. Installation of J2SDK.
2. Write a program to show Scope of Variables
3. Write a program to show Concept of CLASS in JAVA
4. Write a program to show Type Casting in JAVA
5. Write a program to show How Exception Handling is in JAVA
6. Write a Program to show Inheritance
7. Write a program to show Polymorphism
8. Write a program to show Access Specifiers (Public, Private, Protected) in JAVA
9. Write a program to show use and Advantages of CONTRUCTOR
10. Write a program to show Interfacing between two classes
11. Write a program to Add a Class to a Package
12. Write a program to show Life Cycle of a Thread
13. Write a program to demonstrate AWT.
14. Write a program to Hide a Class
15. Write a Program to show Data Base Connectivity Using JAVA
16. Write a Program to show "HELLO JAVA " in Explorer using Applet
17. Write a Program to show Connectivity using JDBC
18. Write a program to demonstrate multithreading using Java.
19. Write a program to demonstrate applet life cycle.
20. Write a program to demonstrate concept of servlet.

PEOPLE'S UNIVERSITY, BHOPAL

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

Subject Title	Subject Code	Credit			Practical		
		L	**T**	**P**	**External**	**Internal (50)**	**Total (50)**
Professional Skills –II	**BT- 406**	-	-	2	Nil	Min: 20 (D Grade)	Min: 20 (D Grade)

Practical internal - max marks: 50

Assignment / Attendance – max. Marks: 50

Contents
Elements of Effective Presentation: Body language and use of voice during presentation; dress, posture, gestures, eye contact and facial expression, connecting with the audience during presentation; projecting a positive image while speaking; planning and preparing a model presentation; organizing the presentation to suit the audience and context; basics of public speaking; preparing for a speech. **Stage Fright, Voice and Language:** Volume, pitch, inflection, speed, pause pronunciation, articulation, language, practice of speech. Use of Aids –OHP, LCD, projector, white board.

PEOPLE'S UNIVERSITY, BHOPAL

PROGRAMME: B.TECH (IT) **SEM: IV**

Subject Title	Subject Code	Credits			Practical		
		L	T	P	Externals (35)	Internals (15)	Total (50)
Hardware & Overview of Embedded System	ITT-407	-	-	2	Min: 12 (D Grade)	Min: Nil	Min: 20 (D Grade)

Practical Internal - Practical Internal - Max Marks: 15

Lab Performa, Lab Record & Viva –Max Marks: 10
Assignment – Max. Marks: 05

Unit	Contents *(Practical)*
I	**BASIC COMPUTER HARDWARE:** History, Introduction to Computer Hardware, Introduction to Peripheral Devices and their Types, Introduction to Memory, Types and Classification and Introduction to Semiconductor Memories. PORTS & PC CARDS Introduction to Ports, Interfacing with Ports, Types of Ports, Introduction to PC Cards, Interfacing with PC Cards and Identification of various Ports on PC Cards. Troubleshooting
II	**Formatting and Partitioning**: Introduction to Hard disks, Formatting of Hard disks, partitioning of hard disks, introduction to software, Installation of System software, Installation of Operating system and application Software
III	**Operating System:** Operating System functionalities, types of operating system, computer architecture support to operating system, process management: process scheduling-Uniprocessor scheduling algorithm, Multiprocessor and real time scheduling algorithms, process synchronization- Peterson's Solution, Bakery Algorithm, Hardware support to process Synchronization, Semaphores, Critical Regions, Monitors-Deadlock prevention, deadlock avoidance and deadlock detection and Recovery-Bankers Algorithm, Threads Memory Management: Segmentation and space allocation, Basics of linking and loading, Demand paging, page replacement algorithms, analysis of page allocation policies
IV	**File System:** Contiguous, Sequential and indexed allocation, File system interface, file system implementation, case study of Unix file system-Buffer Cache, Inodes, The system calls-ialloc, ifree, namei, alloc and free, mounting and unmounting files systems, network file system I/0 System: Disk scheduling, Device drivers-block device switch tables, protection and security-Accessibility and Capability Lists
V	**Embedded System:** Historical background: organization and architectural features of microprocessor and microcontrollers, the intrusion set, instruction format, addressing modes, assembly language programming of 8085 and 8051,interfacing of memory devices, data transfer technique and I/0 Parts, interfacing of keyboard and display devices, programmable interrupt and DMA controllers, interfacing of sensors, transducers, actuators, A/D and D/A Converters, analog signal conditioning circuits, data acquisition system, standard interfaces-RS 232,USB,Development aids and troubleshooting technique ,application examples, advanced microprocessor and microcontrollers.

Text Book:

1. R.Gaonkar, Microprocessor Architecture, Programming and application with 8085,Penram.
2. A.Pal, Microprocessor: Principal and application, Tata McGraw-Hill
3. K.J.Ayala, The 8051 Microcontrller architecture, Programming and application, Penram,
4. Operating System-System programming and operating system D M Dhamdhere,Tata McGraw hill
5. Operating System-Operating system: Modern perspective,2/e,Gray Nutt,Addision Wesley

References:

1. Mazidi and Mazidi,Microcontroller and Embedded System,Pearson Education
2. R.Kapadia, 8051 Microcontroller and Embedded system,Jaico
3. Modern Operating system-Andrew S Tanenbaum, Prentice Hall

PRACTICALS:

Suggested list of experiments(expandable):

1. Installation of Operating System
2. Assembling of resources
3. Study of CD/DVD., Hard disk, RAM/ROM,Mother board
4. Study of Sound/Video Driver
5. Study of Configuration of Web Servers
6. Study of PHP for Deigning and Development of Web Applications
7. Implementation of include() and require() in PHP
8. Implementation of GET Method and POST Method in PHP
9. Study of mail() in PHP
10. Implementing a Database Application in PHP
11. Study of Content Management System