Faculty of Engineering
Scheme of Instruction and Syllabi

of

BE I - IV YEAR

OF
FOUR YEAR DEGREE COURSE

IN

INFORMATION TECHNOLOGY

(With effect from the Academic Year 2013-2014)

July 2013
Osmania University
Hyderabad - 500 007.

WITH EFFECT FROM THE ACADEMIC YEAR 2011 - 2012

SCHEME OF INSTRUCTION & EXAMINATION

B.E. IInd YEAR
INFORMATION TECHNOLOGY

SEMESTER - I

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L	D/P		Univ. Exam	Sessionals
		THEORY					
1.	BIT 201	Discrete Mathematics	4	-	3	75	25
2.	BIT 202	Microelectronics	4	-	3	75	25
3.	BIT 203	Digital Electronics & Logic Design	4	-	3	75	25
4.	BIT 204	Data Structures	4	-	3	75	25
5.	EE 223	Electrical Circuits & Machines	4	-	3	75	25
6.	CE 222	Environmental Studies	4	-	3	75	25
		PRACTICALS					
1.	BIT 231	Basic Electronics - Lab	-	3	3	50	25
2.	BIT 232	Data Structures - Lab	-	3	3	50	25
3.	BIT 233	Mni Project - I	-	3	-	-	25
		TOTAL	**24**	**9**	**-**	**550**	**225**

BIT 201

DISCRETE MATHEMATICS

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Logic - Sets and Functions : Logic, Propositional equivalences - Predicates and quantifiers - Nested quantifiers-Sets-Set Operations, Functions.

Algorithms-Integers-Matrices : Algorithms, Complexity of Algorithms. The Integers and Division, integers and Algorithms, Applications of Number Theory, Matrices.

UNIT-II

Mathematical Reasoning, Induction, and Recursion: Proof Strategy, Sequence and Summation, Mathematical Induction, Recursive Definitions and Structural Induction, Recursive Algorithms.

Counting - Basics, pigeonhole principle, Permutations and combinations-Binomial Coefficients, Generalized Permutations and combinations, Generating permutations and combinations.

UNIT-III

Discrete Probability : An Introduction to Discrete Probability, Probability theory, Expected Value and Variance.

Advances Counting Techniques : Recurrence relations - Solving Recurrence Relations - Divide and conquer relations - and Recurrence Relations, Generating function-Inclusion - Exclusion-Applications of Inclusion-Exclusion.

UNIT-IV

Relations : Relations & their Properties, n-ary relations and applications, Representing relations-Closures, equivalence relations, partial orderings.

Graphs : Introduction, Graph terminology, representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamiltonian paths, Shortest path problems, Planar graphs, Graph coloring.

UNIT-V

Trees : Introduction to Trees, Application of Trees, Tree Traversal, Spanning Trees, Minimum Spanning Trees.

Boolean Algebra : Boolean function, Representing Boolean Functions, Logic Gates, Minimization of Circuits.

Suggested Reading :

1. Kenneth H. Roen-Discrete *Mathematics and its application*- 5th edition, McGraw-Hill, 2003.
2. J.K. Sharma, *Discrete Mathematics,* Second edition, Macmillan, 2005.
3. J.P. Trembly, R. Manohar, *Discrete Mathematical Structure with Application to Computer Science,* McGraw-Hill, 1997.
4. Joel. Mott. Abraham Kandel, P.P. Baker, *Discrete Mathematics for computer Scientist & Mathematicians,* Prentice Hail N.J. 2nd edn, 1986.

BIT 202

MICRO ELECTRONICS

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT – I

Semi-conductors, Conductors, and Insulators, Covalent bonds, conduction in semi-conductors, N-type and P-type semi-conductors, PN junction, Biasing, Zener diodes, Rectifier Circuits, Limiting and clamping circuits, Schottky Barrier diode and Varactor diode.Cathode Ray Oscilloscope and its applications

UNIT – II

Bipolar junction transistors – Physical structure and modes of operation, npn transistor, pnp transistor, characteristics, analysis of transistor circuits at DC, transistor as amplifier, small signal equivalent circuit models, biasing, transistor as switch, internal capacitance.

MOSFET current-voltage characteristics, MOSFET as an amplifier and as a switch, biasing, Internal capacitance.

The Junction Field-Effect Transistors(JFET) – Structure and physical operation, characteristics.

UNIT – III

Feedback – Structure, Properties of negative feedback, Topologies, Advantages of negative feedback. Sinusoidal Oscillators – Loop gain, Barkhausen criteria, RC Phase shift, LC and Crystal Oscillators.
Power Amplifiers: class A, B and C amplifiers.

UNIT – IV

Operational Amplifiers : Ideal characteristics, op. amp. as adder, Subtractor, Integrator, differentiator and comparator using op. amp. generation of square and Triangular waveforms, Monostable multi vibrator.

Op. Amp. As Voltage –controlled current switch(VCCS), Current-controlled Voltage source(CCVS), Instrumentation Amplifier, antilogarithmic amplifiers and analog multipliers.

UNIT – V

Digital CMOS logic circuits: Introduction, digital IC technologies and logic circuit families, Voltage Transfer Characteristic (VTC) of inverter, Noise Margins, Propagation delay, static and dynamic operation of CMOS inverter.
CMOS logic gate circuits: Basic structure (PUN and PDN), Implementation of 2-input NOR gate, NAND gate, complex gates and exclusive OR gate.

Suggested Reading :

1. Adel S. Sedra, Kenneth C. Smith, *Micro Electronic Circuits,* 5th Edition, Oxford International Student Edition, 2006
2. Jocob Millman, Arvin grable, *Micro Electronics,* 2nd Edition, McGraw Hill 1987.
3. Shilling, L.D., Belove, C., *Electronic Circuit – Discrete Integrate,* 3rd Edition, McGraw Hill, ISE, 1989.

BIT 203

DIGITAL ELECTRONICS & LOGIC DESIGN

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT – I

Design Concepts – Digital Hardware, Design process, Design of digital hardware Introduction to logic circuits – Variables and functions, Logic gates and networks. Boolean algebra, Synthesis using gates, Design examples. Optimized implementation of logic functions – Karnaugh Map, Strategies for minimization minimizing product-of-sum functions. Multiple output circuits. NAND and NOR logic networks Introduction to CAD tools and VHDL

UNIT – II

Programmable logic devices: geneal structure of a PLA, gate level diagram, schematic diagram, PAL. Structure of CPLDs and FPGAs, 2-input and 3-input lookup tables(LUT). Design of Arithmetic-circuits using CAD tools. Combinational circuit building blocks – Multi-plexers. Decoders. Encoders. Code converters, Arithmetic comparison circuits. VHDL for Combinational circuits

UNIT – III

Basic Latch, Gated SR Latch, gated D Latch Master-Slave edge triggered flip-flops. T Flip-flop, JK Flip-flop, excitation tables. Registers, Counter. Using registers and counters with CAD tools. Design examples using VHDL.

UNIT – IV

Synchronous Sequential Circuits – Basic design steps. State-Assignment problem Moore and Mealy state mode. Design of Finite state machines with CAD tools, example. State minimization, FSM as an Arbiter Circuit, Analysis of Synchronous sequential Circuits. Algorithmic State Machine carts, formal model.

Implementation using VHDL.

UNIT – V

Asynchronous Sequential Circuits – Behavior, Analysis, Synthesis, State **reduction**, State Assignment, examples.

Hazards : static and dynamic hazards. Significance of Hazards.

Clock skew, set up and hold time of a flip-flop, Shift and add multiplier, data **path** circuit for the multiplier, ASM chart and datapath circuit for the divider **control** circuit, sort operation.

Implementation using VHDL code.

Suggested Reading:

1. Stephen Brown Zvonko Vranesic, *Fundamentals of Digital Logic with VHDL design,* McGraw Hill, 2000.
2. Enocho Hwang, *Digital Logic and Microprocessor Design with VHDL,* Thomson, 2006.
3. John F. Wakerly, *Digital design Principles & Practices*, 3rd Edition, Prentice Hall.
4. M. Moris Mano, Charles R. Kime, *Logic and Computer Design Fundamentals,* 2nd edition, Pearson Education Asia, 2001.
5. H.T. Nagle, *Introduction to Computer Logic,* Prentice Hall, 1975.

BIT 204

DATA STRUCTURES

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT - I

Algorithm Specification, Performance Analysis and Measurement.

Arrays: Abstract Data Types and the C++ Class, Array as an Abstract Data Type, Polynomial Abstract Data Type, Sparse Matrices, Representation of Arrays, String Abstract Data Type.

UNIT - II

Stacks and Queues: Templates in C++, Stack Abstract Data Type, Queue Abstract Data type, Subtyping and Inheritance in C++, A Mazing Problem, Evaluation of Expressions.

UNIT - III

Linked Lists: Singly Linked Lists and Chains, Representing Chains in C++, Template Class Chain, Circular Lists, Available Space Lists, Linked Stacks and Queues, Polynomials, Doubly Linked Lists.

Hashing: Static Hashing, Hash Tables, Hash Functions, Secure Hash Functions, Overflow Handling, Theoretical Evaluation of Overflow Techniques

UNIT - IV

Trees: Introduction, Binary Trees, Binary Tree Traversal and Tree Iterators, Copying Binary Trees, Threaded Binary Trees, Heaps, Binary Search Trees. Graphs: Graph Abstract Data Type, Elementary Graph operations (dfs and bfs), Minimum Cost Spanning Trees (Prim's and Kruskal's Algorithms).

UNIT - V

Sorting: Insertion sort, Quick sort, Best computing time for Sorting, Merge sort, Heap sort, Sorting on Several Keys, List and Table Sorts, Summary of Internal Sorting.

Efficient Binary Search Trees: AVL Trees, Red-Black Trees, Splay Trees, m-**way Search** Trees, B-Trees.

Suggested Reading:

1. Ellis Horowitz, Dinesh Mehta, S. Sahani. *Fundamentals of Data Structures in C++*, Universities Press. 2007.
2. Mark Allen Weiss, *Data Structures and Algorithm Analysis in C++*, Pearson Education 2006.
3. Michael T. Goodrich, Roberto Tamassia, David Mount, *Data structures and Algorithms in C++*, Wiley India Pvt. Ltd, 2004

EE 223

ELECTRICAL CIRCUITS AND MACHINES
(Common for Mechanical Engineering & IT Branches)

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT – I

DC Circuits: Ohm's Law, Network elements, Kirchoff's Law, Power in DC circuits, Series and parallel resistances, Thevinin's and Norton's theorems.

AC Circuits: Sinusoidal sources, Phasor representation of sinusoidal quantities, Average and RMS values, Form factor, Analysis of RLC Circuits to sinusoidal inputs, Power factor, Active & reactive powers, energy stored in inductance and capacitance, Mutual inductance.

UNIT – II

Three-Phase Voltages: Production of 3-phase voltages, balanced star and delta connections, Measurement of power by Two-wattmeter method.

Single Phase Transformers: Principle of operation, Transformer on No-load and Load, Equivalent circuit, Efficiency & regulation, O.C and S.C tests, Principal of Autotransformer

UNIT – III

DC machines: Construction and working principle, EMF in Generator, types of excitation, characteristics of series and Shunt generators, Applications, Torque in a DC motor, Characteristic of Shunt and Series motors, Speed control of DC shunt motors, losses and efficiency, three point starter.

UNIT – IV

Three Phase Introduction Motors: Production of rotating magnetic field, construction and principle of induction motors, Torque –slip characteristics, Star delta and Auto-transformer starters, Speed control by Stator voltage and Rotor resistance methods.

UNIT – V

Single Phase Motors: Capacitor start and Capacitor run motor, Stepper motor.

Three Phase Alternators: Construction, production of EMF, Regulation by synchronous impedance method.

Suggested Reading:

1. M.S. Naidu and Kamakshaiah, *Introduction to Electrical Engineering,* Tata McGraw Hill, 1995.
2. V.K. Mehta, *Principles of Electrical Engineering and Electronics,* S. Chand & Co, 1995.
3. Cotton H., *Electrical Technology,* BI Publications, 1985

CE 222

ENVIRONMENTAL STUDIES
(Common to all Branches)

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNI-I
Environmental studies: Definition, scope and importance, need for public awareness. Natural resources: Water resources; use and over utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. Effects of modern agriculture, fertilizer-pesticide problems, water logging salinity. Energy resources, growing energy needs, renewable and non-renewable energy sources. Land Resources, land as a resource, land degradation, soil erosion and desertification.

UNIT-II
Ecosystems: Concepts of an ecosystem, structure and functions of an ecosystem, producers, consumers and decomposers, energy flow in ecosystem, food chains, ecological pyramids, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT-III
Biodiversity: Genetic species and ecosystem diversity, bio-geographical classification of India. Value of biodiversity, threats to biodiversity, endangered and endemic species of India, conservation of biodiversity.

UNIT-IV
Environmental Pollution: Causes, effects and control measures of air pollution, water pollution, soil pollution, noise pollution, thermal pollution and solid waste management.
Environment Protection Act: Air, water, forest and wild life acts, issues involved in enforcement of environmental legislation.

UNIT-V
Social Aspects and the Environment: Water conservation, watershed management, and environmental ethics. Climate change, global warming,

acid rain, ozone layer depletion. Environmental protection act, population **ex**plosion.
Disaster Management: Types of disasters, impact of disasters on **en**vironment, infrastructure and development. Basic principles of disaster **mi**tigation, disaster management, and methodology, disaster management **cycle**, and disaster management in India.

Suggested Reading :

1. A. K. De, *Environmental Chemistry*, New Age Publications, 2002.
2. E. P. Odum, *Fundamentals of Ecology*, W.B. Sunders Co., USA.
3. GL. Karia and R.A. Christian, *Waste Water Treatment, Concepts and Design Approach*, Prentice Hall of India, 2005.
4. Benny Joseph, *Environmental Studies*,TataMcGraw-Hill, 2005
5. V. K. Sharma, *Disaster Management*, National Centre for Disaster Management, IIPE, Delhi, 1999.

BIT 231

BASIC ELECTRONICS LABORATORY

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

ANALOG:

1. CRO and its applications: Measurement of amplitude, frequency. Obtaining transfer characteristics and lissajous figures. Determination of unknown frequency using CRO.
2. Characteristics of pn junction diode , zener diode, BJT and FET. Applications: Half-wave and full-wave rectifiers, clipping and clamping circuits, BJT and FET as switches
3. Frequency response of Common Emitter amplifier
4. Hartley, colpitts and RC phase shift oscillators
5. Operational Amplifier as an adder, subtractor, differentiator, integrator and comparator

DIGITAL:

6. Truth table verification of logic gates using TTL 74 series ICs. Transfer characteristics of a TTL gate using CRO
7. Half Adder, Full Adder, Decoder, MUX, implementation of Boolean logic using decoders and MUXes.
8. Truth table verification of D flip flop, T flip-flop and JK flip-flop
9. Counters
10. Shift Registers

SOFTWARE:

Any 3 experiments using PSPICE.

Note : All the experiments are compulsory.

BIT 232

DATA STRUCTURES LABORATORY

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

List of Experiments:

1. Implementation of array ADT
2. Implementation of String ADT
3. Implementation of Stacks, Queues.
4. Infix to Postfix Conversion, evaluation of postfix expression.
5. Polynomial arithmetic using linked list.
6. Implementation of Binary Search and Hashing.
7. Implementation of Selection, Shell, Merge and Quick sorts.
8. Implementation of Tree Traversals on Binary Trees.
9. Implementation of Heap Sort.
10. Implementation of operations on AVL Trees.
11. Implementation of Traversal on Graphs.
12. Implementation of Splay Trees.

BIT 233

MINI PROJECT - I

Instruction 3 Periods per week
Sessional 25 Marks

The Students are required to implement one of the projects from project exercise given in the suggested readings of the theory subjects. During the implementation of the project, Personnel Software Process (PSP) has to be followed. Report of the projectwork has to be submitted for evaluation.

SCHEME OF INSTRUCTION & EXAMINATION

B.E. IInd YEAR
INFORMATION TECHNOLOGY

SEMESTER - II

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L	D/P		Univ. Exam	Sessionals
		THEORY					
1.	BIT 251	Probability & Random Processes	4	-	3	75	25
2.	BIT 252	Signals and Systems	4	-	3	75	25
3.	BIT 253	Web Technologies	4	-	3	75	25
4.	BIT 254	Computer Organization & Microprocessors	4	-	3	75	25
5.	BIT 255	OOP Using JAVA	4	-	3	75	25
6.	BIT 256	Data Communications	4	-	3	75	25
		PRACTICALS					
1.	BIT 281	Microprocessors - Lab	-	3	3	50	25
2.	BIT 282	JAVA Programming & Web Technologies Lab	-	3	3	50	25
3.	BIT 283	Mni Project - II	-	3	-	-	25
		TOTAL	**24**	**9**	-	**550**	**225**

BIT 251

PROBABILITY AND RANDOM PROCESSES

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT – I

The meaning of Probability – Introduction- the definitions – Probability and Induction – Causality versus Randomness.

The Axioms of Probability: Set theory – Probability Space – Conditional Probability.

Repeated Trials: Combined Experiments – Bernoulli Trials – Bernoulli's theorem and games of chance.

UNIT – II

The Concept of a Random Variable: Introduction – Distribution and Density functions- Specific Random Variables – Conditional Distributions – Asymptotic Approximations for Binomial Random variables.

Functions of One Random Variables: The Random Variable g(x) – The Distribution of g(x) – Mean and Variance – Moments – Characteristic Functions.

UNIT – III

Two Random Variables: Bivariate Distributions – One Function of Two Random Variables – Two Function of Two Random Variables – Joint Moments – Joint Characteristic Functions – Conditional Distributions – Conditional Excepted Values.

UNIT – IV

Random Processes – Definitions – Basic concepts and examples – Stationarity and ergodicity – Second order processes – Weakly stationary processes – Covariance functions and their properties – Spectral representation Weiner – Kinchine theorem.

UNIT – V

Linear Operations: Gaussian processes – Poisson Processes – Low pass and Band pass noise representations.

Suggested Reading:

1. Papoulis, *Probability, Random Variables and Stochastic processes*, 4th Edition Tata McGraw Hill, 2002
2. Davenport, *Probability and Random Processes for Scientists and Engineers*, McGraw Hill.
3. E.Wang, *Introduction to Random process*, Springer Verlag Publication.
4. H.Stark and J Woods, *Probability, Random Processes and Estimation theory for Engineers*, Prentice Hall.

BIT 252

SIGNALS & SYSTEMS

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT – I

Introduction to signals, Real functions – Continuous time function, Common functions.

Signals – definition, classification, Time scaling, Time shifting, and Limits of signals, Signals defined on intervals, Signals as sum of sinusoids. Fourier Series– introduction to Fourier series, Three representations, Computational formulas

MATLAB Examples: Programs on Time shifting, scaling, Fourier series computation

UNIT – II

Fourier transforms— Definition, properties, generalized Fourier transform, Inverse Fourier transform.

Spectral content of a signal – Amplitude and phase spectra, Energy and power signals, Energy spectral density, Power spectral density, power calculations of periodic signals. Laplace Transform – Definition, properties, partial fraction expansion, solution to differential equations, and relationship to Fourier transforms, Inverse Laplace transform.

MATLAB Examples: Programs on Fourier Transform, Amplitude & Phase spectra of signals, Laplace Transform, solutions to differential equations.

UNIT – III

Discrete Time Signals – Introduction, Sampling, Coding and Quantization, Reconstruction of signal from samples, aliasing, Nyquist sampling theorem, zero-order hold, Representation, Classification, Discrete time energy and Power Signals, Transformation of independent variable (time), Addition, Multiplication and Scaling of Sequences.

MATLAB Examples: Programs on Sampling, reconstruction, DTFT, Time shifting, scaling of discrete time signals.

UNIT – IV

Convolution and Correlation of discrete time signals – Discrete convolution, Graphical interpretation, Convolution properties. Auto and cross correlation and their graphical interpretation. Properties of correlations integrals. Z-transform – Definition, properties. Region of convergence. Z – plane and S-plane correspondence. Inverse Z-Transforms, Solution of linear difference equations.

MATLAB Examples: Programs on Convolution, correlation, Solution of difference equation.

UNIT – V

Systems – Introduction to systems, Definition, representation, examples. System representation - Transfer function, Convolution representation, Fourier transfer function, Block diagram, Block diagram reduction, Properties of System.-Linearity, Time-invariance, Causality, BIBO Stability. Introduction to Discrete- Time systems and Digital filters.

MATLAB Examples: Programs on BIBO Stability, Design of analog filters.

Suggested Reading:

1. Douglas K. Lindner, *Introduction to Signals and Systems,* McGraw Hill 1999.
2. Rodger E. Ziemer, William H Trenter, D. Ronald Faninn, *Signals & Systems,* 4th Edition, Pearson 1998.
3. A.V.Oppenheim, A.S. Willsky, *Signals & Systems*, 2nd Edition, Prentice Hall.
4. Lathi, B.P. *Principles of Linear Systems & Signals,* Oxford University Press, 2nd edition, 2009.

BIT 253

WEB TECHNOLOGIES

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Introduction to Internet, World Wide Web, Web Browsers, Web Servers, Uniform Resource Locators, HTTP,Introduction to XHTML: Origins and Evolution of HTML and XHTML, Standard XHTML document structure, Basic Text Markup, Images, Hypertext Links, Lists, Tables, Frames. Cascading Style Sheets: Text Styles, Types of Style Classes, Block Styles, page layout with CSS.Basics of JavaScript: HTML forms - Overview of Java Script-Primitives, Operations and Expressions-Control Statements, Arrays, Functions, DOM, Element access in JavaScript, Events and event handling.

UNIT-II

Introduction to XML, XML document structure, Document Type Definition, Namespaces, XML Schemas, Displaying raw XML documents, Displaying XML documents with CSS, XPath Basics, XSLT, XML Processors.

UNIT-III

Basics of Perl: Origin and uses of Perl, Strings and escape characters, Scalar variables, Control Statements, Fundamentals of arrays, Hashes, functions, Regular expressions and Pattern matching, File input and output. Perl for CGI Programming: Introduction to Common Gateway Interface, CGI Linkage, CGI environment variables, Query String Format, Form Processing-CGI.PM,GET method, Post method; State and Session Tracking in web applications, Hidden form elements, Cookies.

UNIT-IV

Java Servlets: Java Servlets and CGI Programming, Benefits of Java Servlet, Life cycle of Java Servlet, Reading data from client, HTTP Request header, HTTP Response header, working with cookies, Tracking Sessions.Java Server

Pages: Introduction to JSP, JSP Tags, Variables and Objects, Methods, Control **Statements**, Loops, Request String, User Sessions, Session Object, Cookies.

UNIT-V

Introduction to PHP: Overview of PHP, General Syntactic Characteristics, **Primitives**, Operations,Expressions, Control Statements, Arrays, Functions, **Pattern** matching, Form handling, Files, Cookies, Session Tracking.Database **access** Through Web: Architectures for Database Access- Database access **with** Perl - Database access with PHP-Database access with JDBC.

Suggested Reading:

1. Robert W.Sebesta, *Programming the world wide web,* Fourth Edition, Pearson Education, 2008.
2. Jim Keogh, *The Complete Reference J2EE,* Tata-McGraw-Hill,2002.
3. Craig D.Knuckles, David S.Yuen, *Web Applications concepts & Real world Design,* Wiley India Edition,2006
4. Paul S.Wang, Sanda S.Katila, *An Introduction to Web Design + Programming,* Cangage Learning India Private Limited, 2008.

BIT 254

COMPUTER ORGANIZATION & MICROPROCESSORS

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Basic Structure of Computers: Computer Types, Functional Units, Basic Operational Concepts, Bus Structures, Software, Performance, Multiprocessors and Multicomputers, Historical perspective.

Input/Output Organization: Accessing I/O devices, Interrupts, Processor examples, Direct memory access, Buses, Interface circuits, Standard I/O interfaces.

UNIT-II

The Memory System: Basic concepts, Semi conductor RAM memories, Read-Only memories, Speed, Size and Cost, Cache memories, Performance considerations, Virtual Memories, Memory management requirements, Secondary Storage.

UNIT-III

8085 Architecture: Introduction to microprocessors and microcontrollers, 8085 Processor Architecture, Internal operations, Instructions and timings. Programming the 8085 - Introduction to 8085 instructions, Addressing modes and Programming techniques with Additional instructions.

UNIT-IV

Stacks and subroutines, interfacing peripherals : Basic interfacing concepts, Interfacing output displays, Interfacing input keyboards. Interrupts - 8085 Interrupts, Programmable Interrupt Controller (8259A). Direct Memory Access (DMA) - DMA Controller (Intel 8257), Interfacing 8085 with Digital to Analog and Analog to Digital converters.

UNIT-V

Programmable peripheral interface (Intel 8255A), Programmable **communication** interface (Intel 8251), Programmable. Interval timer (Intel **8253** and 8254), Programmable Keyboard /Display controller (Intel 8279). **Serial** and parallel bus standards RS 232 C, IEEE 488.

Suggested Reading:

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, *Computer Organization,* 5th Edition, McGraw Hill, 2002.
2. Ramesh S Gaonkar, *Microprocessor Architecture, Programming,* and Applications with the 8085, 5/E Prentice Hall, 2002.
3. Pal Chouduri, *Computer Organization and Design,* Prentice Hall of India, 1994.
4. M. M. Mano, *Computer System Architecture,* 3rd Edition, Prentice Hall, 1994.

BIT 255

OOP USING JAVA

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.

Java Programming Fundamentals: Introduction, Overview of Java, Data types, Variables and Arrays, Operators, Control statements, Classes, Methods, Inheritance, Packages and Interfaces.

UNIT-II

Exception Handling, Multithreaded Programming, I/O basics, Reading console input and output, Reading and Writing Files, Print Writer Class, String Handling.

UNIT-III

Exploring Java Language, Collections Overview, Collections Interfaces, Collections Classes, Iterators, Random Access Interface, Maps, Comparators, Arrays, Legacy classes and interfaces, String tokenizer, BitSet , Date, Calendar, Timer.

UNIT-IV

Introducing AWT working with Graphics: AWT Classes, Working with Graphics.

Event Handling: Two Event Handling Mechanisms, The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.

AWT Controls: Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout

Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Exploring the controls, Menus ,and Layout Managers.

UNIT-V

Java I/O classes and interfaces, Files, Stream and Byte classes, Character Streams, Serialization.

Suggested Reading:

1. Herbert Schildt, *The Complete Reference Java,* 7th Edition, Tata McGraw Hill, 2006.
2. James M Slack, *Programming and Problem solving with JAVA,* Thomson Learning, 2002.
3. C Thomas Wu, *An Introduction to Object Oriented Programming with Java,* 5th edition, McGraw Hill Publishing, 2010.

CS 256

DATA COMMUNICATIONS

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	75	Marks
Sessional	25	Marks

UNIT-I

Introduction: Communication model, Data Communication networking, Protocols and Architecture, Standards.

Data Transmission: Concepts and terminology, Analog and Digital Transmission, Transmission Impairments, Transmission media.

Data Encoding: Digital Data Digital Signals, Digital Data-Analog Signals, Analog Data-Digital Signals, Analog Data-Analog Signals.

UNIT-II

Data Communication Interface: Asynchronous and Synchronous Transmission, Line Configuration, Interfacing.

Data Link Controls: Flow Control, Error Detection, Error Control, HDLC, other Data link Control protocols, performance issues.

UNIT - III

Multiplexing: Frequency Division Multiplexing, Synchronous time - Division Multiplexing, Statistical Time – Division Multiplexing. Asymmetric Digital Subscriber line, xDSL. Circuit Switching, Packet Switching & Frame Relay. ATM Architecture, Logical Connection, ATM Cells, Transmission of ATM cells.

UNIT -IV

Traditional Ethernet: Topologies and Transmission Media, LAN protocol architecture, MAC sub layer, - CSMA/CD, Physical Layer, Implementation, Bridged, switched and full duplex Ethernets, Layer 2 and Layer 3 Switches.

Fast Ethernet: MAC sublayer, Physical sublayer, Implementation.

Gigabit Ethernet: MAC sublayer, Physical Layer, Implementation.

UNIT -V

Cellular Wireless Networks: Principles of Cellular Networks, First Generation Analog Second Generation CDMA, Third Generation Systems.

Wireless LANs: Overview, Wireless LAN Technology, IEEE 802.11. Architecture and services, IEEE 802.11 Medium Access Control, IEEE 802.11 Physical Layer.

Bluetooth: Architecture, Layers.

Suggested Reading:

1. William Stallings, *Data and Computer communication,* 7th edition. Pearson Education, Asia-2004.
2. Behrouz A. Forouzan, *Data Communications and Networking,* 4th Edition, Tata McGraw Hill, 2006.
3. Fred Halsall, *Data Communications, Computer Networks and Open Systems,* 4th Edition, Pearson Education, 2000.

BIT 281

MICROPROCESSORS LAB

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

1. Tutorials on 8085 Programming.
2. Interfacing and programming of 8255. (E.g. traffic light controller).
3. Interfacing and programming of 8254.
4. Interfacing and programming of 8279.
5. A/D and D/A converter interface.
6. Stepper motor interface.
7. Display interface.

Note: Adequate number of programs covering all the instructions of 8085 instruction set should be done on the 8085 microprocessor trainer kit.

BIT 282

JAVA Programming & Web Technologies Lab

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

1. A program to illustrate the concept of class with constructors, methods and overloading.
2. A program to illustrate the concept of inheritance, dynamic polymorphism and abstract class
3. A program to illustrate multithreading & thread synchronization.
4. A program using String Tokenizer.
5. A program using Collection classes and Interfaces
6. A program to illustrate the usage of filter and Buffered I/O streams.
7. An application involving GUI with different controls, menus and event handling.
8. Develop HTML form with client validations using Java Script
9. Publishing XML document using XSLT
10. Text processing using Regular expressions and pattern matching.
11. Develop CGI-Perl Web application with State and Session Tracking
12. Develop Java servlet application with session tracking
13. Develop a simple JSP application
14. Develop an application to access database with JDBC

BIT 283

MINI PROJECT - II

Instruction	3	Periods per week
Sessional	25	Marks

Web application Development

Or

Development of any Controller Circuits using CPLD's or FPGA's

Or

Micro Processor Based Project.