WITH EFFECT FROM THE ACADEMIC YEAR 2015-2016

SCHEME OF INSTRUCTION AND EXAMINATION

B.E. II-YEAR (REGULAR)

INFORMATION TECHNOLOGY

SEMESTER-I

Sl.No.	Syllabus Ref.No.	Subject	Scheme of Instruction		Scheme of Examination		
			Periods Per Week		Duration in Hrs	Maximum Marks	
			L	D/P		Univ. Exam	Sessionals
		THEORY					
1	BIT 201	Discrete Mathematics	4	-	3	75	25
2	BIT 202	Micro Electronics	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 221	Electrical Circuits & Machines	4	-	3	75	25
6	CE 222	Environmental Studies	4	-	3	75	25
		PRACTICALS					
1	BIT 231	Basic Electronics Laboratory	-	3	3	50	25
2	BIT 232	Data Structures Laboratory	-	3	3	50	25
3	BIT 233	Mini Project - I	-	3	-	-	25
		Total	24	9	-	550	225

With effect from the academic year 2015-2016

BIT 201

DISCRETE MATHEMATICS

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

Course Objectives:

1. To Learn mathematical concepts as applied in computer science for solving logical problems.
2. To model relationships, analyze data, apply probability concepts and use functions to solve problems.
3. To develop the mathematical skills needed for advanced quantitative courses.

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 theory, Expected Value and Variance.

Advanced 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-ray 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, Spanning Trees, Minimum Spanning Trees.

Boolean Algebra: Boolean function, Representing Boolean functions, Logic Gates

Suggested Reading:

1. Kenneth H. Rosen – Discrete Mathematics and its Application – 5th Edition, McGraw Hill, 2003.
2. J. K. Sharma, Discrete Mathematics, Second Edition, Macmillan, 2005.
3. J.P. Tremblay, R. Manohar, Discrete Mathematical Structure with Application to Computer Science, McGraw Hill – 1997.
4. Joel. Mott. Abraham Kandel, T.P. Baker, Discrete Mathematics for Computer Scientist & Mathematicians, Prentice Hail N.J., 2nd Edition, 1986.

BIT 202

MICRO ELECTRONICS

Instruction	4 Periods Per week
Duration of Examination	3 Hours
Univ. Exam	75 Marks
Sessionals	25 Marks

Course Objectives:

1. To understand basic semiconductor devices and create foundation for forthcoming circuit design courses
2. To train students in logic design for real world problems.
3. To familiarize with the principles of the transducers and advances in Instrumentation.

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, Sub tractor, 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.

With effect from the academic year 2015-2016

BIT 203

DIGITAL ELECTRONICS & LOGIC DESIGN

Instruction	4 Periods Per week
Duration of Examination	3 Hours
Univ. Exam	75 Marks
Sessionals	25 Marks

Course Objectives:

1. To learn the principles of digital hardware and support given by it to the software.
2. To explain the operation and design of combinational and arithmetic logic circuits.
3. To design hardware for real world problems.

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 AND, OR, and NOT Gates, Design examples. Optimized implementation of logic functions – Karnaugh Map, Strategies for minimization, minimizing Product-of-Sum Forms, Incompletely Specified functions, multiple output circuits. NAND and NOR logic networks, Introduction to CAD tools and Very High Speed Integrated Circuit Hardware Description Language (VHDL).

UNIT – II

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

UNIT – III

Basic Latch Gated SR Latch, Gated D Latch, Master-Slave and Edge- Triggered D Flip-Flops, T Flip-flop, JK Flip-flop, Excitation tables. Registers-Shift Register, Counters-Asynchronous and synchronous counters, Ring counter, Johnson counter, VHDL code for D Flip-flop and Up-counter

UNIT – IV

Synchronous Sequential Circuits – Basic design steps. Moore and Mealy state model, State minimization, Design of a Counter using the Sequential Circuit Approach. Algorithmic State Machine (ASM) charts

UNIT – V

Asynchronous Sequential Circuits – Behaviour, 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

Suggested Reading:

1. Stephen Brown, Zvonko Vranesic, “Fundamentals of Digital Logic with VHDL Design”, 2nd Edition, McGraw Hill, 2009.
2. Jain R.P., “Modern Digital Electronics,” 3rd Edition, TMH, 2003.
3. John F. Wakerly, “Digital Design Principles & Practices”, 3rd Edition, Prentice Hall, 2001
4. M. Morris Mano, Charles R. Kime, “Logic and Computer Design Fundamentals”, 2nd Edition, Pearson Education Asia, 2001.
5. ZVI Kohavi, Switching and Finite Automata Theory, 2nd Edition, Tata McGraw Hill, 1995.
6. William I Fletcher, “An Engineering Approach to Digital Design”, Eastern Economy Edition, PHI
7. H.T. Nagle, “Introduction to Computer Logic”, Prentice Hall, 1975.

With effect from the academic year 2015-2016

BIT 204

DATA STRUCTURES

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

Course Objectives:

1. To develop proficiency in the specification, representation, and implementation of abstract data types and data structures.
2. To get a good understanding of applications of data structures.
3. To solve advanced computer science problems by making appropriate choice for intended applications.

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, Sub typing and Inheritance in C++, A Mazing Problem, Evaluation of Expressions.

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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, 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, Efficient Binary Search Trees: AVL Trees, m-way Search Trees, Introduction to Red Black tree & splay tree, B-tree.

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, shell sort, Sorting on Several Keys, List and Table Sorts, Summary of Internal Sorting.

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 221

ELECTRICAL CIRCUITS AND MACHINES
(Common to CSE, IT, ME and PE)

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

Course Objectives
1. To acquire knowledge in electrical circuits.
2. To be able to understand the basic principle operation and performance of electrical machines.

UNIT-I
DC & AC Circuits: Analysis of circuits using loop current method, Thevenin's and Norton's theorems, Sinusoidal sources, Phasor representation of sinusoidal quantities, Average and rms values, Active power, Reactive power, Energy stored in inductance and capacitance, Mutual inductance, Dot convention, analysis of simple coupled circuits.

UNIT-II
Production of 3-Phase Voltages: Analysis of 3-phase balanced circuits, 3-phase power measurement by two-wattmeter method. Transformers: Principle of transformation of voltages and currents, Equivalent circuit of transformer on no load and load, Efficiency and regulation of transformer, OC and SC tests, Auto-transformer.

UNIT-III
DC Machines: Construction and working principle of a DC machine, Production of emf in a generator, Types of excitation, Characteristics of series, shunt and compound motors, Speed control and application of DC motors, Losses and efficiency, three point starter.

UNIT-IV
Induction Motors: Production of rotating magnetic field, Construction and principle of operation of induction motors, Speed-torque characteristics, Methods of starting and Speed control of 3-phase induction motors,

UNIT-V
Single-Phase & Special Motors: Various types of single phase motors, Spilt phase, Capacitor start and Capacitor run, Basic features of Stepper motor and Brushless DC motor.

Suggested Reading:
1. Naidu M.S. & Kamakshiah S, Introduction to Electical Engineering, Tata McGraw Hill, 1995.
2. John Bird, Electrical Circuit theory and Technology, Routledge Taylor & Francis Group, Fourth Edition, 2012.
3. Mehta V.K., Principles of Electrical Engineering and Electronics, S.Chand & Co., 1999.
4. A. Chakrabarti, Sudipta Nath, Chandan Kumar Chanda, "Basic Electrical Engineering" Tata McGraw Hill Education PVT. LTD., 2009.

With effect from the academic year 2015 - 2016

CE 222 **ENVIRONMENTAL STUDIES**

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

Objectives:

- To study the basic concepts, sources of water, floods and their impact on environment
- To know the ecosystems and energy resources systems
- To understand the Biodiversity concepts and their advantages
- To study the different pollutions and their impact on environment
- To know the social and environment related issues and their preventive measures

UNIT– 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 and salinity.

UNIT-II

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

Energy resources: Growing energy needs, renewable and non-renewable energy sources. Land Resources, land as a resource, land degradation, soil erosion and desertification.

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; solid and liquid waste management.

Environment Protection Act: Air, water, forest and wild life Acts, enforcement of environmental legislation.

UNIT-V

Social Issues and the Environment: Water conservation, watershed management, and environmental ethics. Climate change, global warming, acid rain, ozone layer depletion.

Environmental Disaster Management: Types of disasters, impact of disasters on environment, infrastructure, and development. Basic principles of disaster mitigation, disaster management, and methodology. Disaster management cycle, and disaster management in India.

Suggested Reading:

1. A.K. De "Environmental Chemistry", Wiley Eastern Ltd.
2. E.P. Odum "Fundamentals of Ecology", W.B. Sunders Co., USA.
3. M.N. Rao and A.K. Datta "Waste Water Treatment", Oxford and IBK Publications.
4. Benny Joseph "Environmental Studies", Tata McGraw Hill, 2005.
5. V.K. Sharma "Disaster Management", National Centre for Disaster Management, IIPE, Delhi,1999.
6. Teri Document, "Green Building Council of India"

With effect from the academic year 2015-2016

BIT 231

BASIC ELECTROINICS LABORATORY

Instruction	3 Periods Per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessionals	25 Marks

Course Objectives:

1. To study the electronics components.
2. To study characteristics of semi-conductor devices and design rectifiers, filters and amplifiers.
3. To study simple electronic circuits.

List of Experiments

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, sub tractor, 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

With effect from the academic year 2015-2016

BIT 232

DATA STRUCTURES LABORATORY

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

Course Objectives:

1. To design, analyze, and implement basic data structures and algorithms.
2. To implement data structures such as Trees, Threaded Binary Trees, Heaps, graph operations and algorithms.
3. To familiarize with advanced tree structures like AVL, Splay, m-way, B-Trees.

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, quick sort, shell sort, Merge sort.
8. Implementation of tree traversals on Binary Trees.
9. Implementation of Heap Sort.
10. Implementation of operations on AVL trees
12. Implementation of Traversal on Graphs
13. Implementation of Splay Trees

BIT 233

MINI PROJECT - I

Instruction	3 Periods per week
Sessional	25 Marks

Course Objectives:

1. To develop capability to analyse and solve real world problems with an emphasis on applying/integrating knowledge acquired.
2. To take responsibility of the end product.

The Students are required to take one of larger projects listed in the suggested readings or assigned by the teacher, implement and submit the report. The workbooks and project reports should be evaluated.

WITH EFFECT FROM THE ACADEMIC YEAR 2015-2016

SCHEME OF INSTRUCTION AND EXAMINATION

B.E. II-YEAR (REGULAR)

INFORMATION TECHNOLOGY

SEMESTER-II

Sl.No.	Syllabus Ref.No.	Subject	Scheme of Instruction		Scheme of Examination		
			Periods Per Week		Duration in Hrs	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	-	3	3	50	25
3	BIT 283	Mini Project - II (Web Technology based)	-	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

Course Objectives:

1. To induce the ability to describe a random experiment in terms of procedure, observation, and a Probability model.
2. To inculcate ability to characterize functions of random variables
3. To familiarize the students with the methods to characterize stochastic processes with an emphasis on stationary random processes.

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 – Kintchine 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. T.Veerarajan, “Probability, Statistics and Random Process”, 3rd Edition Tata McGraw Hill

3. Peyton Peebles: Probability, Random Variables and Random Signal Principles, Fourth Edition, Tata McGraw Hill

4. H.Stark and J Woods: Probability, Random Processes and Estimation Theory for Engineers, Prentice Hall.

With effect from the academic year 2015-2016

BIT-252

SIGNALS & SYSTEMS

Instruction	4 periods per week
Duration of Semester-End Examination	3 Hours
Semester-End Examination	75 Marks
Sessional	25 Marks

Course Objectives:

1. To explain signals and systems representations/classifications and also describe the time and frequency domain analysis of continuous time signals with Fourier series, Fourier transforms and Laplace transforms.
2. To understand Sampling theorem, with time and frequency domain analysis of discrete time signals with DTFS, DTFT and Z-Transform.
3. To present the concepts of convolution and correlation integrals and also understand the properties in the context of signals/systems and lay down the foundation for advanced courses.

UNIT-I

Some useful operations on signals: Time shifting, Time scaling, Time inversion.
Signal models: Impulse function, Unit step function, Exponential function, Even and odd signals.
Systems: Linear and Non-linear systems, Constant parameter and time varying parameter systems,
Static and dynamic systems, Causal and Non-causal systems, Lumped Parameter and distributed parameter systems, Continuous-time and discrete-time systems, Analog and digital systems.

UNIT-II

Fourier Series:
Signals and Vectors, Signal Comparison: correlation, Signal representation by orthogonal signal set, Trigonometric Fourier Series, Exponential Fourier Series, LTI system response to periodic inputs.

UNIT-III

Continuous-Time Signal Analysis:
Fourier Transform: Aperiodic signal representation by Fourier integral, Fourier Transform of some useful functions, Properties of Fourier Transform, Signal transmission through LTI Systems, ideal and practical filters, Signal energy.
Laplace transform: Definition, some properties of Laplace transform, solution of differential equations using laplace transform.

UNIT-IV

Discrete-time signals and systems: Introduction, some useful discrete-time signal models, Sampling continuous-time sinusoids and aliasing, Useful signal operations, examples of discrete-time systems.
Fourier Analysis of discrete-time signals, periodic signal representation of discrete-time Fourier Series, aperiodic signal representation by Fourier integral.

UNIT-V

Discrete-time signal analysis:

Z-Transform, some properties of Z-Transform, Solution to Linear difference equations using Z-transform, System realization. Relation between Laplace transform and Z-transform.

DTFT: Definition, Properties of DTFT, comparison of continuous-time signal analysis with discrete-time signal analysis.

Suggested Reading:

1. B. P. Lathi, Linear Systems and Signals, Oxford University Press, 2nd Edition, 2009
2. Alan V O P Penheim, A. S. Wlisky , Signals and Systems, 2nd Edition, Prentice Hall
3. Rodger E. Ziemer, William H Trenter, D. Ronald Fannin, Signals and Systems, 4th Edition, Pearson 1998.
4. Douglas K. Linder, Introduction to Signals and Systems, McGraw Hill, 1999
5. P. Ramakrishna Rao, Signals and Systems, , TMH

With effect from the academic year 2015-2016

BIT 253

WEB TECHNOLOGIES

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

Course Objectives:

1. To design and develop web pages using html5, CSS positioning, Servlets and JDBC.
2. Understanding and writing a well-formed XML schemas and documents.
3. Using JSP as view component in MVC based web applications.
4. Understanding .NET architecture and writing applications with ADO.NET

UNIT-I

Introduction: Web Fundamentals, **HTML 5.0:** basic tags, Form elements and attributes.
Introduction to Cascading Style Sheets: CSS selectors, CSS BOX Model, CSS Positioning, and CSS floating.
JQuery: Introduction to JavaScript, Selecting elements in the documents, Event handling, working with styles, The Event object, Using and creating plugins, JSON Fundamentals.
Web-Based and REST Style Services:

UNIT-II

Introduction to XML: The Syntax of XML, XML Document Structure, Document Type Definitions, Name Space, XML Schemas, Displaying raw XML Documents, Displaying XML Documents with CSS, XSLT Style Sheets and XML Processors.

UNIT-III

Java Servlets: Servlet Life Cycle, Basic Servlet Structure, request methods, passing initialization parameters from web.xml, Handling the client request form data, Generating HTTP Response, Request dispatching and State Management techniques.
Java Server Pages: Expressions, Scripting elements, Page Directives, Actions, JSP Objects, Handling Exceptions, MVC Flow of Control, Accessing Ms Access, My SQL and Oracle databases using Servlets and JSP.

UNIT-IV

Web Services: Definition, Web services Architecture, Simple Object Access Protocol (SOAP) - goals, structure and contents of a SOAP Message, processing a SOAP message, Web Services Description language (WSDL) - Structure of WSDL interface, Implications of WSDL Model, Universal description discovery and integration (UDDI) - Goals, Information in a UDDI registry, UDDI data structures, UDDI Registry API.

UNIT-V

ASP.NET: Web Form fundamentals, Web Controls, State management, Building better web form - Validation, rich controls, user controls and graphics, Data Management with ADO.NET, ASP.NET with Ajax.

Suggested Reading:

1. Robert W. Sebesta, “Programming with World Wide Web”, Eighth Edition, Pearson Education, 2008.
2. John Pollak, “JQuery - A Beginners Guide”, McGraw Hill Education, 2014.
3. Phil Hanna, “The Complete Reference JSP”, First Edition, Tata McGraw-Hill, 2003.
4. Gustavo Alonso ,“Web Services: Concepts, Architectures and Applications” Springer Science & Business Media, 2004
5. Matthew MacDonald, “Beginning ASP.NET 4.5 in C#”, Illustrated, A press, 2012.
6. James Webber, Savas Parastatidis, Ivan Robinson, “Rest in Practice: Hyper Medid and System Architecture”, First Edition, O’REILLY, 2010.

With effect from the academic year 2015-2016

BIT 254

COMPUTER ORGANIZATION & MICROPROCESSORS

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

Course Objectives:

1. To provide in depth knowledge to the students about the design and organization of a digital computer, operation of various functional units, instruction set design and factors that influence the performance of a computer.
2. To enable the students with the understanding of basic computer architecture with instruction set and programming of 8085 in particular.
3. To learn the functionality and interfacing of various peripheral devices.

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.

With effect from the academic year 2015-2016

BIT 255

OOP USING JAVA

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

Course Objectives:

1. To understand fundamentals of object-oriented programming in Java which includes defining classes, invoking methods, using class libraries.
2. To create Java application programs using sound OOP practices such as interfaces, APIs and error exception handling.
3. Using API to solve real world problems.

UNIT- I

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

Java Programming Fundamentals: History of Java, Java buzzwords, data types, variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, exploring string class.

UNIT- II

Inheritance: Inheritance concept, benefits of inheritance, Super classes and Sub classes, Member access rules, Inheritance hierarchies, super uses, preventing inheritance: final classes and methods. Polymorphism - dynamic binding, method overriding, abstract classes and methods, the Object class and its methods.

Interfaces: Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages

UNIT- III

Exception handling: Dealing with errors, benefits of exception handling, the classification of exceptions - exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, exception specification, built in exceptions, creating own exception sub classes

Multithreading: Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads

UNIT- IV

Collections: Overview of Java Collection frame work, Commonly used Collection classes – ArrayList, LinkedList, HashSet, HashMap, TreeMap, Collection Interfaces – Collection, Set, List, Map, Legacy Collection classes – Vector, Hashtable, Stack, Dictionary(abstract), Enumeration interface, Iteration over Collections – Iterator interface, ListIterator interface.

Other Utility classes: String Tokenizer, java.util. Files – streams - byte streams, character streams, text Input/output, binary input/output, random access file operations, File management using File class, java.io. , serialization

UNIT- V

GUI Programming with java: The AWT class hierarchy, Introduction to Swing, Swing vs. AWT, MVC architecture, AWT Classes.

AWT Controls: Components, container, panel, window, frames, canvas, Font class, Color class and Graphics, Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog.

Event Handling: Handling mouse and keyboard events, Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces. Examples: handling a button click, handling mouse and keyboard events, Adapter classes.

Applets – Inheritance hierarchy for applets, differences between applets and applications, life cycle of an applet, Developing applets and testing, passing parameters to applets, applet security issues.

Suggested Reading:

1. Herbert Scheldt, "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.
4. H. M. Dietel and P. J. Dietel, Java How to Program, Sixth Edition, Pearson Education / PHI

CS 256

DATA COMMUNICATIONS

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

Course Objectives:

1. To understand the basics of data transmission, transmission media, data communications system and its components.
2. To describe various encoding and modulation schemes, various data link protocols for flow control, error detection and correction.
3. To understand different types of multiplexing, spread spectrum techniques, Ethernet, services of WLANs and Bluetooth.

UNIT-I

Introduction: Communication model and Modulation Techniques (AM, FM and PM), 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 Control: Flow Control, Error Detection, Error Control, HDLC, Other Data link Control Protocols, Performance Issues**.**

UNIT - III

Multiplexing & Switching: Frequency Division Multiplexing, Wavelength 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

Ethernets: Traditional Ethernet Topologies and Transmission Media, LAN protocol architecture, MAC sub layer, CSMA/CD, Physical Layer, Bridged, Switched and Full Duplex Ethernets. Fast Ethernet: MAC sub Layer, Physical layer, Gigabit Ethernet: MAC sub Layer, Physical Layer

UNIT –V

Cellular Wireless Networks: Principles of Cellular Networks, First Generation Analog, Second Generation CDMA and 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 & Zigbee: Architecture, Layers and Protocols.

Suggested Reading:

1. William Stallings, “Data and Computer Communication”, 8th Edition, Pearson Education, Asia-2004.
2. Behrouz A. Forouzan, “Data Communications and Networking”, 4th Edition, Tata McGraw Hill, 2006.
3. Simon Haykins “Communication Systems”, 2nd Edition, John Wiley & Sons
4. Drew Gislason “Zigbee Wireless Networking” Elsevier Published: August 2008

With effect from the academic year 2015-2016

BIT 281

MICROPROCESSORS LAB

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

Course Objectives:

1. To become familiar with the architecture and Instruction set of Intel 8085 microprocessor.
2. To provide practical hands on experience with Assembly Language Programming.
3. To familiarize the students with interfacing of various peripheral devices with 8085 microprocessor.

List of Experiments

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.

With effect from the academic year 2015-2016

BIT 282

JAVA PROGRAMMING LAB

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

Course Objectives:

1. To build software development skills using java programming for real world applications.
2. To implement frontend and backend of an application
3. To implement classical problems using java programming.

List of Experiments

1. Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java. util)
2. Write a Java program to illustrate the concept of class with method overloading.
3. Write a Java program to illustrate the concept of Single level and Multi level Inheritance.
4. Write a Java program to illustrate the concept of Dynamic Polymorphism.
5. Write a Java program to demonstrate the Interfaces & Abstract Classes.
6. Write a Java program to implement the concept of exception handling.
7. Write a Java program to illustrate the concept of threading using Thread Class and runnable Interface.
8. Write a Java program to illustrate the concept of multi-threading that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.
9. Write a Java program to implement serialization concept
10. Write a Java program to illustrate the concept of Thread synchronization.
11. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
12. Write a Java program that reads a file name from the user, and then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
13. Write a Java program that reads a file and displays the file on the screen, with a line number before each line.
14. Write a Java program that displays the number of characters, lines and words in a text file.
15. Write a Java program to change a specific character in a file.
    Note: Filename, number of the byte in the file to be changed and the new character are specified on the command line.
16. Write a Java program to illustrate collection classes like Array List, Iterator, Hash map etc.
17. Write a Java program for handling mouse & key events.
18. A program to illustrate the concept of I/O Streams
19. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.

With effect from the academic year 2015-2016

BIT 283

MINI PROJECT – II

Instruction	3 Periods per week
Sessional	25 Marks

Course Objectives:

1. To develop capability to analyse and solve real world problems with an emphasis on applying/integrating knowledge acquired.
2. To take responsibility of the end product.

The Students are required to take one of larger projects listed in the suggested readings or assigned by the teacher, implement and submit the report. The workbooks and project reports should be evaluated.