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.

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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

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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.

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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.

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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

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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.

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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.

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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.