

SARDAR PATEL UNIVERSITY

Programme & Subject: B.Sc. (CA & IT) – M.Sc. (CA & IT) Dual Degree

Semester: V

Syllabus with Effect from: June - 2018

Paper Code: PS05CIIT01		Total Credit: 3
Title of Paper: Software Engineering - I		
Unit	Description in Detail	Weightage (%)
I	<p>Introduction Defining Software & Introduction to SE Characteristics of Software Activities of Software Process Umbrella Activities Process Flow (Linear, Iterative, Evolutionary, Parallel) Process Model: Waterfall, Prototype, Iterative, Enhancement, Spiral (Overview) CMM</p>	25%
II	<p>System Requirement Specification and Software Project Planning Introduction to System Requirement Specification and need of SRS Requirement Specifications, Characteristics & Components of SRS Specification Languages (Structured English, Regular Expressions & Decision Tables) (Definition Only) Structure and Validation of SRS. Introduction to Software Project Planning and list of major issue of project plan Overview Cost Estimation (Uncertainties in Cost Estimation, Building Cost Estimation Models, On Size Estimation, COCOMO model) Project Monitoring Plan (Time sheets, Reviews, Cost-Schedule-Milestone, Earned Value Method, Unit Development Folder Quality Assurance Plans Overview of Risk Management</p>	25%
III	<p>System Design Introduction to System Design , Design Principles (Problem Partitioning & Hierarchy, Abstraction, Modularity, Top-Down and Bottom-up strategy Module Level Concepts (Coupling & Cohesion) Introduction: Detailed Design, Module Specification (Specifying Functional Module, Specifying Classes) Verification- Design Walkthrough, Critical Design, review, Consistency checkers</p>	25%
IV	<p>Coding & Testing Introduction: Coding, coding process(Top Down & Bottom Up Approach for coding) , Structured Programming, Information Hiding, Programming Style, Internal Documentation Verification with code reading. Introduction: Testing, Error, Fault, Failure & Reliability, Testing Process (Top down and bottom up approach for testing) Levels of Testing Functional Testing v/s Structural Testing (Difference Only)</p>	25%

Basic Text & Reference Books:

Software Engineering a practitioner's approach by Roger S. Pressman, Tata McGraw-Hill, Seventh Edition

An Integrated Approach to Software Engineering by Pankaj Jalote ,Narosa Publishing House, Second Edition,1997



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Paper Code: PS05CIIT02		Total Credit: 3
Title of Paper: Computer Architecture		
Unit	Description in Detail	Weightage (%)
I	Basic Computer Organization Instruction Code Computer Register Computer Instructions Timing and Control Instruction Cycle Register Reference Instructions Memory Reference Instructions Input – Output Interrupt Types of Interrupt External Interrupt Internal Interrupt Software Interrupt	25%
II	Central Processing Unit Introduction General Register Organization Control Word Stack Organization Register Stack Memory Stack Reverse Polish Notation Instruction Formats Zero Address Instructions One Address Instructions Two Address Instructions Three Address Instructions Addressing Mode Data Transfer and Manipulation Data Transfer Instruction Data Manipulation Instructions Arithmetic Instructions Logical and Bit Manipulation Instructions Shift Instructions Program Control Status Bit Condition Conditional Branch Instruction	25%
III	Pipeline and Vector Processing Parallel Processing Pipelining Arithmetic Pipeline Instruction Pipeline Four Segment Instruction Pipeline	25%

	Data Dependency Handling of Branch Instruction Vector Processing Vector Operations Matrix Multiplication Memory Interleaving Superscalar Processors Supercomputers Array Processor Attached Array Processor SIMD Array Processor	
IV	Input-Output Organization Peripheral Devices Input – Output Interface I/O Bus and Interface Modules I/O versus Memory Bus Asynchronous Data Transfer Strobe Control Handshaking Asynchronous Serial Transfer Asynchronous Communication Interface Mode of Transfer Direct Memory Access (DMA) DMA Controller DMA Transfer	25%

Basic Text & Reference Books:

Computer System Architecture, Third Edition, By M. Morris Mano

Computer Organization and Architecture, 4th Edition By William Stallings

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Paper Code: PS05CIIT03		Total Credit: 3
Title of Paper: Object Oriented Programming Through Java		
Unit	Description in Detail	Weightage (%)
I	<p>Introduction History of Java, features, the Java environment, the Java Virtual Machine (JVM) Structure of a Java program, a simple Java program, implementing a Java program Tokens, comments, constants, variables and data types Scope of variables, type casting Operators: arithmetic, relational, logical, assignment, increment/decrement, conditional, ternary operator & special operators Decision making: if statement, if...else statement, nesting of if...else, the else if ladder, switch statement Looping: while, do...while, for, for each loop, jumps in loops, labeled loops Arrays: one, two dimensional arrays</p>	25%
II	<p>Classes, Objects, Interfaces and Inheritance Defining a class, members of a class: variables and methods, creating objects, constructors, accessing class members Static members v/s instance members Introduction to inheritance, <i>super</i> keyword Interfaces: introduction Final variables, methods and classes, abstract methods and classes Introduction to method overloading and overriding</p>	25%
III	<p>Exception Handling, I/O Management and Packages Managing errors & exceptions: introduction, types of errors, exceptions, syntax of exception handling construct, multiple catch statements, the finally clause, defining and throwing user-defined exceptions, the throw statement Managing I/O files : introduction, concept of streams, Character stream classes Introduction to the concept of package, Java API packages, using the System package Using java.lang (String, Math)</p>	25%
IV	<p>Applet Programming & JDBC Applet architecture and skeleton java.awt package (Button, CheckBox, CheckBoxGroup, Choice, Color, Label, List, TextArea, TextField) HTML applet tag, display techniques (DrawString, Lines, Rectangle, Ellipses, Circles, Arcs, Polygons, Color) Introduction to event handling Introduction to JDBC, types of drivers java.sql package Retrieving, inserting, deleting and updating data through Java</p>	25%

Basic Text & Reference Books:

Programming with Java- A Primer by E. Balaguruswami, 3rd Edition, TMH Publication

The Complete Reference – Java 2 7th Edition Herbert Schildt. TMH Publication

Saba Zame , Handbook of Object technology, CRC Press, Washington DC, 1999

Mary Campion and Kathy Walrath, Java tutorial, Second Edition, Addison Wesley Pun. 1998.

Java 2 Programming Black Book, Steven Holzner



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Paper Code: PS05CIIT04		Total Credit: 3
Title of Paper: Server Side Web Programming Using ASP.NET		
Unit	Description in Detail	Weightage (%)
I	<p>Introduction ASP.NET – Introduction, overview of ASP.NET framework The ASP.NET Life cycle, Understanding ASP.NET controls ASP.NET 4.0 coding Models : Single-File Page Model, Code-Behind Page Model The Global.asax Application file Introduction to Web.Config Internet Information Server (IIS) Using Visual C# in ASP. NET: Introduction, Variables, Data Types, Value Types, Scope of Variables, Operators, OOPs Concepts (Encapsulations, Inheritance, Polymorphism and Abstraction)</p>	25%
II	<p>ASP.NET Standard Controls and Validation Controls Using standard controls : [Control Properties] Label, TextBox, Button, CheckBox, CheckBoxList, RadioButton, RadioButtonList, Linkbutton, ImageButton, Hyperlink, DropDownList, ListBox Overview of the validation controls : RequiredFieldValidator, RangeValidator, CompareValidator, RegularExpressionValidator, CustomValidator, ValidationSummary Overview of various rich controls : AdRotator, FileUpload, Calendar Grouping Controls : Panel, Placeholder Master Page and Themes</p>	25%
III	<p>Accessing Data in ASP.NET ADO.NET Architecture-Connected and disconnected ADO.NET basics: DataProvider, Connection, Command, DataReader, Dataset, DataAdapter ADO.NET Basic Control : GridView, DataList, DetailsView, FormView, ListView, Repeater State Management using View State, QueryString, Cookies, Session State, Application State and Profile Using TreeView, Menu, SiteMapPath</p>	25%
IV	<p>Advanced Features Login Controls Introduction to LINQ Standard Query Operators Introduction to LINQ to ADO.NET (Insert, Update, Delete, Join) Simple Application Based on LINQ Introduction to AJAX – Need for Ajax, Advantage and Disadvantage ASP.NET Ajax Architecture – Client-Side and Server-Side ScriptManager Control, Ajax Controls (Basic Controls) Simple Application Based on Ajax Control</p>	25%

Basic Text & Reference Books:

ASP.NET 4.0 Covers C# 2010 & VB 2010 codes BLACK BOOK, Dreamtech Press

Programming in C#, E Balagurusamy, Tata McGraw-Hill

The Complete Reference C# 4.0, Herbert Schildt, Tata McGraw Hill, Edition 2010 (Third Reprint 2011)



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Paper Code: PS05CIIT05		Total Credit: 6
Title of Paper: Practical - V		
Unit	Description in Detail	Weightage (%)
	Practical: Based on PS05CIIT03	50%
	Practical: Based on PS05CIIT04	50%

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Paper Code: PS05EIIIT01		Total Credit: 2
Title of Paper: Multimedia Technology		
Unit	Description in Detail	Weightage (%)
I	Introduction Introduction to Multimedia Digital Media : audio, text, graphics, animation, video Types of Multimedia Applications Multimedia : hardware/software essentials, Multimedia Application	25%
II	Working with Audio, Text and Graphics Multimedia audio : introduction to digital audio and sound card composition and connectivity, Music synthesis, digital audio playback, Digital Audio : editing process , need and editing terminologies Multimedia text : introduction, Text as a part of Multimedia Project, Text designing basics ,effects of poor text content design and display design and parameters that control text design, ,hypermedia, hypertext Multimedia graphics : introduction, basic concepts of colour displays, Color depth, Resolution, colour monitors and their parameters	25%
III	Working with Video and Animation Multimedia video : introduction, Role of digital video in multimedia projects, full motion and full screen videos, digital video production techniques – video shooting , video capture process, video post production Multimedia Animation : introduction, Need for animation , classifications, two- dimensional animation and three dimensional animation technology, animation development process: Phase 1 and Phase 2.	25%
IV	Multimedia Project Multimedia project design concepts – introduction, conceptualization and development, data gathering , developing media content , Designing interface. Multimedia authoring : introduction, multimedia programming vs. multimedia authoring, authoring methodologies, characteristics of authoring tools, commercial authoring tools.	25%

Basic Text & Reference Books:

Multimedia Magic. (Revised and updated Second edition)By S. Gokul, BPB Publications, 2005.
 Introduction to Multimedia : By Ana Weston Solomon, Tata McGraw-Hill Publishing Company Limited, 2005

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Paper Code: PS05EIT02		Total Credit: 2
Title of Paper: Introduction to Green IT		
Unit	Description in Detail	Weightage (%)
I	An Overview Introduction Environmental Concerns & Sustainable Development The inconvenient truth Sustainable development Why should you go green? Environmental impact of IT Green IT Green IT Framework Direct impact of IT Enabling impact of IT Systemic impacts of IT Holistic Approach to Greening IT Greening computer's entire life cycle The three Rs of green IT Applying IT for enhancing environmental sustainability	25%
II	Green Devices and Hardware Introduction Life cycle of a device or hardware Reuse, recycle and dispose Processor Power Status C-status and P-status Energy Saving Software Techniques Computational efficiency Data efficiency Awareness of power source Idle efficiency	25%
III	Green Data Centres and Storage Data Centre IT infrastructure Data Centre facility infrastructure : Implications for energy efficiency IT infrastructure management Storage media power characteristics Energy management techniques for hard disks System level energy management	25%
IV	Green Networks and Sustainable Software Development Introduction Objectives of green network protocols Green network protocols and standards Sustainable software Software sustainability attributes Software sustainability metrics	25%

Basic Text & Reference Books:

Harnessing Green IT : Principles and Practices. First Edition. Edited By San Murugesan and G.R. Gangadharan , Published By John Wiley & sons ,Ltd

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Paper Code: PS05FIIT01		Total Credit: 4
Title of Paper: Operation Research		
Unit	Description in Detail	Weightage (%)
I	Introduction to Operations Research(OR): History, meaning and scope of OR Phases of OR study Types of Models Applications, advantages and limitations of OR	25%
II	Linear Programming Problem(LPP) Meaning Advantages and limitations Formulation of LPP Graphical solution, Simplex method – Big M method	25%
III	Transportation Model and Assignment Model Introduction Mathematical model of Transportation problem Initial basic feasible solution by North-west corner rule, Least-cost method, Vogel's approximation method. Optimum Solution by MODI method Introduction to an Assignment Model Mathematical model of Assignment problem Solution by Hungarian method	25%
IV	Sequencing Problems and Project Scheduling in PERT-CPM Sequencing problems and Applications for two and three machines. Introduction to PERT and CPM Advantages and Assumptions Rules for Network construction Critical Path calculations, Total float, Free float	25%

Basic Text & Reference Books:

- Taha H. A. : Operations Research, Macmillan, New York (1987)
Sharma S.D. : Operations Research. Kedar Nath Ram Nath & Co. Meerut , 1988-89.
Gillett B. E.: Introduction to Operations Research - a computer oriented algorithmic approach, McGraw-Hill, 1976
Bronson Richard : Operations Research, Schaum's outline Series, 1983.
Kapoor V K : Problems and solutions in Operations Research, Sultan Chand & sons, 1996.