

SARDAR PATEL UNIVERSITY
M. Sc. (Information Technology)
(2 years Full-time course)

First Semester (6 months)

Old Code	New Code	Subject
IT-101	PS01CINT01	Introduction to Information Science
IT-102	PS01CINT02	Advanced Programming Concepts & Data Structures
IT-103	PS01CINT03	Introduction to Theoretical Computer Science
IT-104	PS01CINT04	RDBMS & Client Server Computing
IT-105	PS01CINT05	Operating System Concepts
IT-106	PS01CINT06	Practical based on PS01CINT02 and PS01CINT04

Second Semester (6 months)

IT-201	PS02CINT01	Modern MIS Techniques
IT-202	PS02CINT02	Software Engineering
IT-203	PS02CINT03	Visual Programming
IT-204	PS02CINT04	Web Programming
IT-205	PS02CINT05	Practical based on PS02CINT03 and PS02CINT04
IT-202A	PS02EINT01	Systems and Information Concepts in Organization
IT-202B	PS02EINT02	E-Commerce & M-Commerce
IT-202C	PS02EINT03	Trends in ICT

Elective:

IT-202A	Systems and Information Concepts in Organization
IT-202B	E-Commerce & M-Commerce
IT-202C	Trends in ICT

Third Semester (6 months)

IT-301	PS03CINT01	Java Programming
IT-302	PS03CINT02	Data Communication and Networking
IT-303	PS03CINT03	Information Security
IT-304	PS03CINT04	Distributed Application Development Technology
IT-305	PS03CINT05	Practical based on PS03CINT01 and PS03CINT04
IT-304A	PS03EINT01	Artificial Intelligence
IT-304B	PS03EINT02	Data Mining and Data Warehousing
IT-304C	PS03EINT03	Multimedia and Graphics
IT-304D	PS03EINT04	Mobile Application Development Using Android and Windev

Elective:

IT-304A	Artificial Intelligence
IT-304B	Data Mining and Data Warehousing
IT-304C	Multimedia and Graphics
IT-304D	Mobile Application Development Using Android and Windev

Fourth Semester (6 months)

IT-401	PS04CINT01	Project Work
IT-402	PS04CINT02	Seminar

Paper No: IT-101

Paper Title: Introduction to Information Science

Unit 1: Information Science

- Introduction
- Data
- Information & Information Technology
- Information Quality – Meaning, accuracy, timeliness, flexible formation, decision-making oriented
- Information reliability
- Category of information in Business organization – strategic, tactical and operational
- Batch Processing
- On-line Processing
- Transaction Processing

Unit 2: Data Storage

- Compression
- Encryption
- Integrity
- Protection
- Authentication

Unit 3: E-Business

- Overview
- Benefits
- Web Server Software and Hardware
- Supply Chain
- Overview of M-Business

Unit 4: E-Commerce

- Overview
- Model of E-Commerce
- Challenges in E-Commerce
- Payment Systems
- Banking
- Online Shopping
- Security
- Change management and re-engineering
- Future trends

Unit 5: Data Communication-I

- Communication Media
- Protocols
- Transmission Media
- OSI Model

Unit 6: Data Communication-II

- Signals
- Encoding
- Error Detection & Corrections

Reference Books:

1. Mathew Reynolds: Beginning E-Commerce – Wrox Press Ltd.
2. R.M. Stair & W. Reynolds: Principles of Information Systems – Thomson Learning
3. Forouzan: Introduction to Data Communications and Networking - TMH

Paper No: IT-102

Paper Title: Advanced Programming Concepts & Data Structures

Unit 1: Advanced Programming Concepts

- Pointers and Indirection
- Command line arguments
- Macros
- File Management
- Graphics

Unit 2: Object Oriented Concepts

- Difference between conventional and object oriented languages
- Abstraction and Encapsulation
- Classes, objects and instantiation, data members, methods
- Inheritance

Unit 3: Object Oriented Programming

- Polymorphism, function and operator overloading
- Implementing polymorphism and overloading
- Implementing inheritance, access control, virtual methods
- Creating and destroying objects, runtime memory management

Unit 4: Data Structures

- Arrays
- Linked Lists
- Stacks
- Queues
- Trees

Unit 5: File Management

- Concepts of fields, records and files
- Variable length records
- Sequential file organization
- Random file organization

Unit 6: Indexing Methodology

- Indexing structures like B trees and B+ trees
- ISAM
- Hashing techniques for direct files
- Inverted lists, multi-lists
- Heaps

Reference Books:

1. Tremblay J. & Sorenson P.G: An Introduction to Data Structures with Applications 2nd Edition – TMH
2. Singh Bhagat & Naps Thomas: Introduction to Data Structures – TMH
3. Liberty Jesses & Keogh Jim: C++ An Introduction to Programming – PHI
4. Langran Yedidyah, Augeustem Moshe J, Tenenbaum Aron M: Data Structures Using C and C++ - PHI
5. Stroustrup, Bjarne: The C++ Programming Language 3rd Editioin – Addison Wesley

Paper No: IT-103

Paper Title: Introduction to Theoretical Computer Science

Unit 1: Introduction

- Finite, Infinite and uncountable infinite sets
- Ordered sets
- Phrase structure grammars
- Types of Grammars and languages, the rules of sum and product
- Relations and functions
- Relational database model
- Reflexive, symmetric and transitive relations, compatibility and equivalence relations
- Partial ordering relations and lattices

Unit 2: Graphs.

- Introduction
- Multigraphs and weighted graphs
- Paths and circuits
- Shortest path in a weighted graph
- Eulerian and Hamiltonian paths and circuits Planar graphs

Unit 3: Analysis of algorithms

- Introduction
- Time complexity of algorithms
- The shortest path algorithm
- Complexity of problems
- Tractable and intractable problems.

Unit-4: Lattices and Boolean algebras

- Basic properties
- Operations of join and meet in a lattice
- Distributive lattices
- Boolean algebras as lattices Canonical expressions
- Applications to digital circuits and switching circuits.

Unit-5: Time Series and Forecasting

- Introduction
- Utility of Times Series analysis
- Components of Time series
- Cyclic variation and Irregular variation
- Method of measurements of components, Merits and demerits
- Forecasting models and methods.

Unit-6: Fuzzy Logic

- Introduction
- Difference between Fuzzy logic and conventional control methods
- Fuzzy logic and sets
- Applications of Fuzzy logic

Reference Books:

1. C Lliu: Elements of Descrete Mathematics – TMH
2. J.E.Hopcroft and J D Ullman: Introductory Theory of Computer Science - Addison Wesley

Paper No: IT-104
Paper Title: RDBMS & Client Server Computing

Unit 1: Introduction

- Fundamentals of RDBMS
- Data models
- Operations on RDBMS
- Database design and Normalization, ERD.

Unit 2: Structured query language.

- Introduction to SQL syntax
- Data definition language commands
- Data manipulation language commands
- Data control language commands
- Database objects like views, indexes, sequence, synonyms, and snapshot.

Unit 3: Extension to SQL

- Introduction to PL/SQL: control structures and subprograms
- Stored Procedures and Functions
- Transaction control, concurrency control
- Database triggers, packages and error handling.

Unit 4: Fundamentals of Client Server Systems

- Introduction to distributed system
- Structure of distributed database
- Commit protocols
- Introduction to Client-Server systems
- Two-tier and Three-Tier client-server architecture

Unit 5: Client Server Tools

- Introduction to various types of tools
- Strategies for building automated systems
- Event-driven programming
- Reverse Engineering
- Study of front-end tool

Unit 6: Case Study

Reference Books:

1. Elmasri R and Navathe S.B: Fundamentals of Database Systems - The Benjamin/Cummings Pub
2. Joe Salemi: Guide to Client/Server Database – ZD Press
3. User Manuals of Selected RDBMS Packages.

Paper No: IT-105

Paper Title: Operating System Concepts

Unit 1: Introduction

- Functions
- Types of Operating Systems
- Structure of operating system – Monolithic, Layered

Unit 2: Process Management

- Process Concept
- Scheduling algorithms
- Inter Process communications - critical sections, mutual exclusion, semaphores, monitors, message passing
- Dead Locks – detection, prevention and avoidance

Unit 3: Memory Management

- Contiguous Allocations: static and dynamic partitioned memory, segmentation
- Non- Contiguous Allocations: Paging, segmentation, demand paging segmentation, allocation and replacement policies

Unit 4: Device Management

- Device characteristics
- Disk Space Management
- Allocation & Disk Scheduling Algorithms

Unit 5: File Management

- File System and Directory Structure Organization
- File Protection

Unit 6: Case Studies of Unix, Windows-NT and Netware Operating Systems

Reference Books:

1. Silberschatz: An OS Concepts – Addison Wesley
2. W. Stallings: Operating Systems – PHI
3. I.M. Flenn and A.M. Mechoes: Understanding Operating Systems – Thomas Learning
4. Tanenbaum: Operating Systems Design and Implementation - PHI

Paper No: IT-106

Paper Title: Practical based on IT-102 and IT-104

Practical are based on Paper No. – 102 and Paper No. – 104

M. Sc. (Information Technology) – 2nd Semester Syllabus

Paper No: IT-201

Paper Title: Modern MIS Techniques

Unit 1: Introduction

- MIS: Importance of MIS, Evolution of MIS, Computers and MIS
- Logical foundations of MIS, Typical MIS
- Information and managerial effectiveness
- Business information systems
- Business functions and information needs of business
- Pitfalls in MIS System

Unit 2: Information Systems Environment

- Systems theory
- Classic view of organization
- Transitional views
- Modern organization theory
- Major organizational considerations
- Managerial roles
- Decision making models
- Role of information systems in decision
- The impact of computer science on organization, on individual
- Classification of information systems

Unit 3: Information systems and Managerial process

- Managerial decision making,
- Decision making environment
- Planning and Security for IT infrastructure
- Portfolio approach and identifying its proposals
- Evaluating IT investments and information systems

Unit 4: Developing Effective MIS

- MIS Development Process
- Management, Information and Systems Approach
- Strategic and Project Planning
- Conceptual System Design

Unit 5: Types of information systems

- Transaction processing systems
- Office automation systems
- Decision support systems
- Executive information systems
- Expert systems and need resource matching.

Unit 6: Decision Support System and Intelligent systems

- DSS and Intelligent systems
- Decision making in DSS
- Knowledge and know-how representations for decision
- Classification of DSS
- Constructing a Decisions support system
- Group Decision Support systems
- Decision Support systems for e-business strategies.

Reference Books:

1. Muneesh kumar: Business Information Systems - Vikas Publishing
2. E Turban: Management Information Systems and Decision Support Systems – TMH
3. Sadagopan: Management Information Systems- Narosa Publications
4. Lucas: The analysis design and implementation of information Systems – TMH
5. Efrain Turban Jaye: Decision support systems and Intelligent systems Aronson Fifth edition PHI
6. Murdick, Ross and Clagget: Information System for Modern Management – PHI

Paper No: IT-202

Paper Title: Systems and Information Concepts in Organization

Unit 1: Operations Management

- Overview of Organizational Structure
- Managing Operations Subsystems
- Strategic role of operation
- Operations, strategies and forecasting
- Production planning and control management

Unit 2: Material Management

- Material requirement planning
- Scheduling and ordering system

Unit 3: Personnel Management

- Introduction
- Training and Development
- Needs and Designing
- Motivation and Leadership
- Strategies of implementing HRD
- Manpower planning and forecasting

Unit 4: Quality Management

- Introduction
- Inspection and Test
- Japanese Technique
- Total Quality Management
- Tools and Techniques

Unit 5: Quality Assurance

- Introduction
- CMM
- ISO Model

Unit 6: ERP

- Introduction
- Overview of ERP and related technologies
- ERP Models
- ERP Modules
- Benefits
- Life Cycle

Reference Books:

1. E.E Adam, R.J. Ebert: Production and Operations Management Concepts, Models and Behavior – PHI
2. S.A. Sherlekar: Modern Business Organization and Management – Himalaya
3. Y.K. Bhushan: Fundamentals of Business Organization and Management – S. Chand & Company
4. Vinod Kumar Garg: ERP Concept and Practice – PHI

Paper Title: E-Commerce & M-Commerce

Unit – 1: Electronic Commerce:

- **Introduction:** Overview, Definitions, Advantages & Disadvantages of E –Commerce, Threats of E – Commerce, Managerial Prospective, Rules & Regulations for Controlling E – Commerce, Cyber Laws.
- **Technologies:** Relationship between E – Commerce & Networking, Different Types of Networking for E – Commerce, Internet, Intranet & Extranet, EDI Systems
- **Wireless Application Protocol:** Definition, Hand Held Devices, Mobility & Commerce, Mobile Computing, Wireless Web, Web Security, Infrastructure Requirement For E –Commerce.

Unit – 2: Business Models of E–Commerce:

- **Business Models:** Model Based On Transaction Type, Model Based On Transaction Party - B2B, B2C, C2B, C2C, and E – Governance.
- **E – Strategy:** Overview, Strategic Methods for developing E – commerce.
- **Four C's:** (Convergence, Collaborative Computing, Content Management & Call Center).
 - Convergence: Technological Advances in Convergence – Types, Convergence and its implications, Convergence & Electronic Commerce.
 - Collaborative Computing: Collaborative product development, contract as per CAD, Simultaneous Collaboration, Security.
 - Content Management: Definition of content, Authoring Tools & Content Management, Content – partnership, repositories, convergence, providers, Web Traffic & Traffic Management; Content Marketing.
 - Call Center: Definition, Need, Tasks Handled, Mode of Operation, Equipment, Strength & Weaknesses of Call Center, Customer Premises Equipment (CPE).

Unit – 3: Supply Chain Management:

- E – logistics
- Supply Chain Portal
- Supply Chain Planning Tools (SCP Tools)
- Supply Chain Execution (SCE),
- SCE - Framework
- Internet's effect on Supply Chain Power

Unit – 4: E–Payment Mechanism:

- **Payment Mechanism:** Payment through card system,
 - E – Cheque
 - E – Cash
 - E – Payment Threats & Protections
- **E – Marketing:**
 - Home – shopping
 - E – Marketing
 - Tele – Marketing

Unit – 5: Electronic Data Interchange (EDI):

- **EDI:**
 - Meaning,
 - Benefits,
 - Concepts,
 - Application,
 - EDI Model,
 - Protocols (UN EDI FACT / GTDI, ANSI X – 12),
 - Data Encryption (DES / RSA).
- **Risk of E – Commerce:**
 - Overview, Security for E – Commerce,
 - Security Standards, Firewall,
 - Cryptography,
 - Key Management,
 - Password Systems,
 - Digital certificates,
 - Digital signatures.

Unit – 6: Basic of M–Commerce:

- **Introduction:**
 - M-Commerce Revolution,
 - Introduction,
 - What is M-Commerce,
 - M-Commerce value chain,
 - Technologies of M-Commerce-Transition to 3G-Mobile Internet
 - Mobile Security & Payment.
- **Applications of M–Commerce:**
 - M-Commerce services today & tomorrow,
 - Mobile Commerce services today-Next Generation.

Reference Books:

1. E-Commerce, M. M. Oka, EPH
2. Kalakotia, Whinston: Frontiers of Electronic Commerce, Pearson Education.
3. Bhaskar Bharat : Electronic Commerce – Technologies & Applications.TMH
4. Loshin Pete, Murphy P.A.: Electronic Commerce, Jaico Publishing Housing.
5. Murthy: E – Commerce, Himalaya Publishing.
6. E – Commerce: Strategy Technologies & Applications, Tata McGraw Hill.
7. Global E – Commerce, J. Christopher & T.H.K. Clerk, University Press
8. Beginning E-Commerce, Reynolds, SPD
9. Krishnamurthy, E – Commerce Mgmt, Vikas
10. M-Commerce-Technologies, services & Business Models – Norman Sadesh

TRENDS IN INFORMATION & COMMUNICATION TECHNOLOGY (ICT)

PS02EINT03 Trends ICT

(3 LECTURES AND 1 SEMINAR/TUTORIAL PER WEEK)

COURSE CONTENTS:

1. TRENDS IN OPERATING SYSTEM
 - Comparison of different operating system including Real time systems
 - Popular features
 - New trends
2. Trends in Application Software
 - New industrial requirement
 - Software industry survey
3. Trends in Hardware
 - Hardware selection
 - Trends in hardware
4. Trends in communication and networking
5. Trends in software development
 - New development tools
 - New development language
 - New technologies
6. System Security
 - Security and protection in information system
 - Communication science – cryptography and data security

MAIN SOURCE FOR REFERENCES:

1. SOFTWARE MAGAZINES ON CURRENT TOPICS
2. INTERNET WEB SITES

BOOKS FOR ADDITIONAL READING:

1. Sylvana at al: Database security, Addison –Wesley
2. Solig Willium: Cryptography and network security, Prentice- hall of India. 2000
3. Behrouz forouzan, introduction to data communication & networking, Tata McGraw Hill,1999

ICT (IT-202 Trends in ICT)

Unit 1: Outline:-

1. Operating System Overview
2. Distributed Operating System
3. Advantages Of DOS over centralized system
4. Advantages Of DOS over Independent PC's
5. Disadvantages Of DOS
6. Hardware Concepts
 - a. Flynn's Theorem
7. Multi Processor
8. Multi Computer
9. Software Concepts
10. Comparison diff OS
11. Design Issue
12. RTOS(Real time o.s)

Unit 2 Trends in Application Software.

Outline:-

1. Overview Of SAP.
 - SAP modules
2. Introduction to J2ME.
3. Web services
 - Introduction.
 - Architecture and procedure
4. Web server
 - Definition
 - Example
 - HTTP Request Types

- Web Site versus Web Server
 - Steps in Handling a Client Request
 - Access Control
 - Dynamically Generated Responses
 - Web server technologies
 - Advantages and disadvantages of client side scripting
 - Advantages and disadvantages of server side scripting
5. Application Server.
 - Definition
 - Services
 - Application Protocols.
 6. 3-Tier Architecture.
 7. 3Layers , role , utility

Unit 3 Trends In Hardware

Outline

1. Computer
2. Processor
 - 2.1 Register
 - 2.2 Cache Memory
 - 2.3 A.L.U
 - 2.4 C.U
 - 2.5 Factors affecting processors speed
3. Motherboard
4. Monitor
5. Memory
6. Disk
7. Optical drives

Unit 4 Trends In Communication and Networking

Out line

1. MTU, Path MTU, Reassembly
2. IPV6
 - a. IPV6 Features
 - b. New changes in IPV6 compare to IPV4
 - c. Difference Between IPV6 and IPV4
 - d. Advantages Of IPV6
 - e. IPV6 Base Header
 - f. IPV6 Fragmentation and IPV4 Fragmentation
3. Blue Tooth Technologies
 - a. overview
 - b. Bluetooth Profile
 - c. Bluetooth Protocol stack
 - d. Piconet and scatternet
4. Grid Computing
 - a. Benifits of grid computing
 - b. Types of Grid
5. NAT (Network Address Translation)
 - a. PAT (Port Address Translation)

Unit 5 Trends In Software Development Outline

1. XML (eXtensible Markup Language)
 - a. DTD (Document Type Definition)
 - b. Building Blocks of XML
 - c. Well formed and valid document
2. Introduction to J2EE
 - a. history
 - b. Java 2 Platform Enterprise Edition(J2EE)
 - c. J2EE Features
 - d. Java : Foundation for J2EE
 - e. J2EE Components & Services
 - f. Why use J2EE? or Advantages of using J2EE
 - g. Disadvantages of J2EE
3. Servlet
 - a. Introduction
 - b. Advantages/Disadvantages
 - c. Advantages of servlet over CGI
 - d. Difference Between CGI and Servlet
 - d. Servlet Model
 - e. Servlet Design

- f. Servlet Life Cycle
- g. Servlet Methods
- h. Packages Contains by the servlet API's

Unit 6 System Security

Out line

1. Firewall
 - A. Introduction.
 - B. Configuration of firewall.
 - C. function of firewall / fundamental techniques used to implement the function of firewall
2. Viruses
 - A. Types Of Computer Viruses
 - B. Steps required to save the computer from unauthorized attacks/ Reducing Your Chances of Infection.
3. Cryptography
 - A. substitution cipher
 - B. Transposition cipher

- **Paper Title: Data Mining & Data Warehouse**

Unit 1: DATA MINING-INTRODUCTION

- Data mining introduction-
- information and production factor –
- Data mining Vs Query tools –
- Data mining in marketing – self learning computer systems - .
- Concepts learning –
- Data learning –
- Data mining and the data warehouse.

Unit 2: Project Planning and Management

- Scope
- Role and Responsibilities
- Life Cycle approach

Unit 3: Data Warehouse Architecture- System Process

- Introduction
- Process flow within an data warehouse
- Extract and Load Process
- Clean and Transform data
- Backup and Archive Process
- Query Management Process

Unit 4: Data Warehouse Architecture- Process Architecture

- Introduction
- Load and Warehouse Manager
- Query Manager
- Detailed and Summary Information
- Metadata
- Data Marting

Unit 5: Database Design – Logical

- Database Schema – Starflake
- Partitioning strategy
- Aggregations
- Data Marting
- Metadata
- System and Data Warehouse Process Manager

Unit 6: Database Design – H/W and Operational

- H/W Architecture
- Physical Layout
- Security
- Backup and Recovery
- Service Level Agreement
- Operating Data Warehouse

Reference Books:

1. S. Anahory & D. Murray: Data Warehousing in the real world – Addison Wesley
2. R. Kinball: Data Warehouse Toolkit – John Wiley & Sons
3. R. Kinball, L.Reeves : The Data Warehouse Lifecycle Toolkit – John Wiley & Sons
4. Pieter Adriaans, Dolf Zantinge, "Data Mining", Addison Wesley, 1996.

Paper No: IT-203

Paper Title: Software Engineering (Old Syllabus)

Unit 1: Software Engineering

- Introduction
- Software components and characteristics
- Software Category
- Software process models – Linear Sequential, Prototyping, Evolutionary Process

Unit 2: Requirement Analysis & Analysis Modeling

- Software Requirements
- Problem Analysis
- Fact Finding Techniques
- Software Requirement Specifications
- Specification Review
- Structured Analysis Process
- Functional Modeling and Information flow

Unit 3: Software Decision

- Design Process
- Design Principles and Concepts
- Design Methods – Data Design, Architectural Design, Procedural Design
- Design Documentation
- Object Oriented Design

Unit 4: Coding and Testing

- Coding and Programming Practice
- Testing Fundamentals
- Testing Approaches – White Box Testing, Basic Path Testing, Control Structure Testing, Black Box Testing
- Testing Strategies- Unit Testing, Integration Testing, Validation Testing
- Object Oriented Testing

Unit 5: Software Maintenance

- Maintenance Process
- System Documentation
- Maintainability Measurements

Unit 6: Project Management and Advanced Concepts

- Management Planning
- Project Planning and Cost Estimation
- Software Quality and Reliability
- Software Re-Engineering

Reference Books:

1. Roger S. Pressman: Software Engineering – A Practitioner’s Approach – TMH
2. Ian Sommerville: Software Engineering – Addison Wesley
3. Stephan Schach: Software Engineering with Java - TMH

Course Content		Hours
UNIT 1	Introduction to Software Engineering	
	<ul style="list-style-type: none">• Software Process and process models• Characteristics of Software Process• Software development process models<ul style="list-style-type: none">▪ Waterfall model, Prototyping, Iterative	6
UNIT 2	S/W Requirement, Analysis and Specification	
	<ul style="list-style-type: none">• Need of Software Requirement• Types of Requirements• Requirement Engineering Process• Software Requirement Specifications• Characteristics of SRS Documentation• Organization of SRS• Role of System Analyst	8
UNIT 3	Software Project Management	
	<ul style="list-style-type: none">• Project and Project Management• Role of Project Manager• Project Management Process• Size Estimation• Effort and Schedule Estimation – COCOMO Model• Risk Management	7
UNIT 4	Software Design	
	<ul style="list-style-type: none">• Overview of Functional Design• Design Principles• Module level Concepts• Design Approaches<ul style="list-style-type: none">▪ DFD, Structure Chart• OO Analysis and Design• UML Overview<ul style="list-style-type: none">▪ Class Diagram, Activity Diagram, Sequence and Collaboration Diagram, State Chart Diagram, Use Case Diagram▪ Generalization, Specialization, Relationship	12
UNIT 5	Software Testing	
	<ul style="list-style-type: none">• Coding Process – Incremental Coding Process, TDD• Common Coding Error• Error, Fault and Failure• Black Box Testing• Overview of Testing Tools	8
UNIT 6	Software Maintenance	
	<ul style="list-style-type: none">• Types of S/W maintenance process• Software Re-engineering	4

Reference Books:

1. An Integrated approach to Software Engineering – By Pankaj Jalote (3rd Edition), Narosa Publication
2. Software Engineering – By Sageeta Sabharwal, New Age Int. Publication
3. Software Engineering – A Practioners Approach – By Roger. Pressman (5th Edition), MGH Int. Publication

Paper No: IT-204
Paper Title: Visual Programming (Old Syllabus)

Unit 1: Introduction

- Concept of programming
- Various programming approach
- Introduction to Visual Programming
- Graphical development environment
- Program design in a visual programming Environment.

Unit 2: Visual Programming Using Visual Basic

- Programming architecture in Visual Basic
- VB development environment
- Basic components of a VB project (forms, menus, modules, etc.)
- VB main screen & its element
- VB program elements - data types, variables, statements, operator, functions etc.

Unit 3: Advanced features in VB

- Graphics
- Multimedia
- File handling, Error handling and debugging applications
- Database programming (DAO, RDO, ADO)
- Active X Control and ActiveX servers
- Crystal Reports.

Unit 4: Visual Programming using Visual C++

- Anatomy of a C++ program
- VC++ development environment
- VC++ program and view
- Keyboard and mouse input
- Dialog Boxes and menus

Unit 5: Advanced Programming in Visual C++

- Graphics
- Single document and view
- Multiple document and view
- Persistence and files
- Exception handling
- Database programming

Unit 6: Developing window-based applications using Visual Programming

- Introduction to windows programming
- Developing Window-based applications through Visual Programming
- Linking applications on window platform

Reference Books:

1. Peter Wright's: Beginning with Visual Basic 6 – Techmedia
2. David Jung, Lowell Maver: VB 6 Super Bible - Techmedia

	Topics	Hours
UNIT 1	Introduction to .Net Framework Architecture <ul style="list-style-type: none">CLR, CTS, CLS, BLSMSIL, Managed Code, Garbage Collection, Namespaces, Generics, Collections Assemblies <ul style="list-style-type: none">Private, SharedWorking with assemblies and the GAC Introduction to .Net Technologies <ul style="list-style-type: none">Console Application, Windows Application, Web Applications, Smart Device Applications etc.Introduction to WPF and WCF	7
UNIT 2	Fundamentals of C# .Net <ul style="list-style-type: none">Syntax, data types, variables, predefined data types, Flow Controls, Enumerations, Arrays, Preprocessor DirectivesClasses, Structures Fundamentals of OOPs <ul style="list-style-type: none">Inheritance, Polymorphism, Interfaces, Delegates Error and Exception Handling	7
UNIT 3	Windows Forms <ul style="list-style-type: none">Creating a Windows Form ApplicationForm Class and Control ClassStandard ControlsCreating Menus and ToolbarsMDI	10
UNIT 4	Database Access for .Net <ul style="list-style-type: none">ADO .Net OverviewADO .Net in Connected ArchitectureADO .Net in Disconnected ArchitectureViewing .Net DataGenerating Reports	8
UNIT 5	Windows Presentation Foundation <ul style="list-style-type: none">XAMLShapesControlsLayoutsStylesData BindingWindow Forms Integration	9
UNIT 6	Advanced Features of .Net <ul style="list-style-type: none">MultithreadingRemoting & Network ProgrammingCustom Controls	4

Reference Books:

- Beginning/Professional C# with .Net 3.0- Wrox Publication

Paper No: IT-205
Paper Title: Web Programming (Old Syllabus)

Unit 1: Basics of Internet

- Hardware Components
- Protocols
- Browsers, Mail Clients, Web Servers, Mail Servers

Unit 2: Markup Languages

- Introduction
- Tags, Linking Pages, Creating Tables, Forms and Frames
- Publishing Web Page
- Introduction to DHTML
- Tags and CSS
- Overview of XML

Unit 3: Client Side Scripting

- Introduction to Scripting Language
- Hierarchy, Operators, Expressions and Control Structures
- Functions
- Placing Texts in Browser
- Built – in Functions
- Overview of VB Script

Unit 4: Server Side Programming

- Introduction
- Concepts
- Objects- Response, Request, Session, Application, Object Context & Server
- Connecting to Database

Unit 5: Web Designing Tool(s)

- Creating Objects
- Creating Animations
- Working with Sounds
- Publishing
- Advantages and Disadvantages

Unit 6: Web Server Technology

- Introduction
- Components
- MMC (Microsoft Management Console)

Reference Books:

1. Powel, Thomas: HTML – The Complete Reference - TMH
2. Ivan Baryons: HTML, DHTML, JavaScript, CGI & Perl
3. Bonnie Blake – Macromedia Flash - TMH
4. McFarLane: Professional JavaScript – Wrox
5. Rogger Jennings: Windows NT Using Server 4 - PHI
6. Eric A. Smith: ASP – 3 Programming Bible - IDG
7. Heather Williamson: XML – The Complete Reference - TMH

Paper No: IT-205
Paper Title: Web Programming (New Syllabus w. e. f. AY – 2009-10)

	Topics	Hours
UNIT 1	Basics of Internet	
	<ul style="list-style-type: none">• Hardware Components• Protocols• Browsers, Mail Clients, Web Servers, Mail Servers	8
	HTML Fundamentals	
	<ul style="list-style-type: none">• Text Formatting Tags, Physical Tags, Forms Tags, Table Tags, Frame Tags etc.	
UNIT 2	DHTML Fundamentals	
	<ul style="list-style-type: none">• Introduction to DHTML• Introduction to CSS• Creating and Managing Styles• Website Layout and Design	7
UNIT 3	Introduction to JavaScript	
	<ul style="list-style-type: none">• Difference between Client-Side Vs Server-Side JavaScript• Fundamental JavaScript Directives• Server Side JavaScript• JavaScript Objects	7
UNIT 4	Introduction to OpenSource	
	<ul style="list-style-type: none">• Introduction to OpenSource• Advantages and Capabilities of OpenSource• PHP Vs JSP and ASP• Adding PHP to HTML• Introduction to Apache• Applications of OpenSource like Drupal, WordPress, Cake PHP(CMS, Joomla, MVC) etc.	6
UNIT 5	PHP Programming	
	<ul style="list-style-type: none">• Syntax and Variables• Control and Functions• Arrays, Array and String Functions• Regular Expression• Passing information between pages	10
UNIT 6	Working with MySQL	
	<ul style="list-style-type: none">• Configuring PHP for Database• Introduction to MySQL• MySQL functions• Executing System Calls (Select, Insert, Fetch, Update, Delete)• Database Connectivity• Retrieving Data from Forms• Introduction to Session and Cookies	7

Reference Books:

- Ivan Baryons: HTML, DHTML, JavaScript, CGI & Perl
- O'reilly Publication : PHP Cookbook
- Wiley Publication : PHP and MySQL

Paper No: IT-206
Paper Title: Practical based on IT-204 and IT-205
Practical are based on Paper No. – 204 and Paper No. – 205

M. Sc. (Information Technology) – 3rd Semester Syllabus

Paper No: IT-301

Paper Title: Java Programming

Unit 1: Introduction to Java

- Origin & Features of Java language
- Java development Kit & Java packages
- Class, Object, Memory management, Polymorphism in Java, Inheritance, Overloading and overriding in Java.

Unit 2: Advanced Programming Concepts

- Exception handling
- I/O & File management
- Multithreading
- JDBC

Unit 3: Implementation Advanced Programming Concepts using Visual Programming

- Introduction
- Event handling
- Visual programming using AWT
- Advanced Visual programming using JFC

Unit 4: Web Programming

- Applets design
- Servlets / JSP
- Network programming

Unit 5: Advanced Concepts-I

- Java Beans
- RMI & CORBA

Unit 6: Advanced Concepts-II

- Java mail API

Reference Books:

1. Patrick Naughton: Complete Reference – TMH
2. Daniel Joshi and Paul Vorobeiu: The Java 1.1 Programmer – Comdex Times
3. C. Thomas: Introduction to Object Oriented Programming with Java - TMH
4. Naughton: The Java Hand Book - TMH

Paper No: IT-302

Paper Title: Data Communication and Networking

Unit 1: Network Communication

- Reference models (OSI and TCP/IP) & their comparison
- Network devices (Repeater, Bridge, Router, Gateway)
- Network Management

Unit 2: Internet Protocol

- Introduction to TCP/IP (IPV4, IPV6), HTTP, FTP, SMTP, MIME, TELNET, UDP
- IP header, IP routing, subnet addressing, subnet mask
- TCP Service model, segment header, connection management, transmission policy, congestion control

Unit 3: Wireless Technology - I

- Satellite Networks
- Digital Cellular Radio
- BlueTooth
- SMS

Unit 4: Wireless Technology - II

- Introduction and architecture
- WAP: Architecture and features, Understanding WAP Browser and server
- WML
- Understanding tags: Creating WML scripts, execution using WAP browser

Unit 5: Distributed Computing - I

- Introduction to distributed computing environment.
- COM - Basic fundamentals, creating simple client and server
- DCOM: Architecture , reusability, scalability, performance, fault tolerance

Unit 6: Distributed Computing - II

- DCOM – Connection management, Concurrency management, security issues
- CORBA – Architecture, object model, communication model, CORBA Services, CORBA Facilities.
- Introduction to Jini

Reference Books:

1. Andrew Tanenbaum: Computer Networks - PHI
2. R. Smith: Cryptography and Network Security Principles and Practice 2nd edition – PHI
3. Robert Orfali, Dan Harkey: Client/Server Programming with Java & Corba
4. Richard Grimes: Professional DCOM Programming – Wrox
5. Professional WAP - Pearson Education

Paper No: IT-303
Paper Title: Information Security

Unit 1: Understanding TCP/IP

- Addressing methods
- Network configuration and access files
- TCP/IP daemons, utilities and commands
- Audit trails- Unix logs, accounting and utilities, Windows NT audit trails
- Architecture for securing VPN
- IP Spoofing and sniffing – sniffing methods, sniffing results, sniffing prevention, ARP, ICMP and TCP Spoofing

Unit 2: Firewalls

- Introduction to firewall
- Components and characteristics
- Types of firewall
- Building firewalls
- Brief idea of using network security reporting tools – SATAN

Unit 3: Encryption

- Techniques
- Cryptography
- Digital ID's, Certificates and Signatures
- Symmetric (secret key) Cryptography
- Asymmetric Cryptography
- Cryptanalysis
- SSL

Unit 4: PGP (Pretty Good Privacy)

- Overview
- Using PGP, generating, distributing, signing public keys
- Keys and Key management
- Message Operations

Unit 5: Operating System Security

- NT Overview
- Logon and authentication
- Intranet related features of NT
- Web Server IIS
- Proxy Server
- Configuring Services and ports in NT
- Unix Security

Unit 6: Java and CGI Security

- Java virtual machine
- Setting Java Security

Reference Books:

1. Internet Security – Professional Reference, Techmedia
2. Maximum Security Author – Anonymous Techmedia

Paper No : IT-304
Paper Title : Artificial Intelligence

Unit 1: Introduction

- AI Problem Characteristics
- Introduction to AI as an specified area of advanced DSS
- Computer vision and perception
- Problem solving
- Machine Learning
- Robotics
- Searching in Problem space

Unit 2: Expert Systems

- Introduction
- Expert system shells
- Explanation
- Rule based system and Forward-Backward chaining

Unit 3: Knowledge acquisition, Representation and Engineering

- Approaches and issues in knowledge representation
- Network representation
- Structures: Semantic nets, Frames , Scripts
- Fuzzy logic and reasoning
- Fuzzy logic in Knowledge representation and reasoning

Unit 4: Prolog

- Introduction
- Prolog rules and predicates
- Controlling the execution
- Input and Output
- Database (static and dynamic)

Unit 5: Natural language processing

- Natural language processing
- Level and stages of Natural language analysis
- Fuzzy logic in NLP

Unit 6: Neural Networks

- Introduction
- Basic of Neuroscience
- Types of Neural Networks
- Learning and self organizing Neural Networks
- Fuzziness in Neural Network
- Applications of Neural Network

Reference Books:

1. Elaine Rich and Kelvin Knight: Artificial Intelligence 2nd Edition - TMH
2. AWL, Eugene Charniak: Introduction to Artificial Intelligence - Drew McDermott
3. Morgan Kaufmann :Exploring Artificial Intelligence- Howard E. Shrobe
4. Carl Townsend :Introduction to Turbo Prolog - BPB
5. W.F.Clocksinn and C.S. Mellish : Programming In Prolog 3rd Edition - Narosa Publication House
6. N.K.Bose , P.Liang :Neural Network Fundamentals with Graphs , Algorithm - McGraw Hill Publications

Paper Title : Data Mining & Data Warehouse

Unit 1: DATA MINING-INTRODUCTION

- Data mining introduction-
- information and production factor –
- Data mining Vs Query tools –
- Data mining in marketing – self learning computer systems - .
- Concepts learning –
- Data learning –
- Data mining and the data warehouse.

Unit 2: Project Planning and Management

- Scope
- Role and Responsibilities
- Life Cycle approach

Unit 3: Data Warehouse Architecture- System Process

- Introduction
- Process flow within an data warehouse
- Extract and Load Process
- Clean and Transform data
- Backup and Archive Process
- Query Management Process

Unit 4: Data Warehouse Architecture- Process Architecture

- Introduction
- Load and Warehouse Manager
- Query Manager
- Detailed and Summary Information
- Metadata
- Data Marting

Unit 5: Database Design – Logical

- Database Schema – Starflake
- Partitioning strategy
- Aggregations
- Data Marting
- Metadata
- System and Data Warehouse Process Manager

Unit 6: Database Design – H/W and Operational

- H/W Architecture
- Physical Layout
- Security
- Backup and Recovery
- Service Level Agreement
- Operating Data Warehouse

Reference Books:

1. S. Anahory & D. Murray: Data Warehousing in the real world – Addison Wesley
2. R. Kinball: Data Warehouse Toolkit – John Wiley & Sons
3. R. Kinball, L.Reeves : The Data Warehouse Lifecycle Toolkit – John Wiley & Sons
4. Pieter Adriaans, Dolf Zantinge, "Data Mining", Addison Wesley, 1996.

Paper Title : Multimedia and Computer Graphics

Unit – 1: MULTIMEDIA

- Introduction
- Definition
- Multimedia Hardware
- Multimedia Software
- Multimedia Networking
- Multimedia Application
- Multimedia Environments
- Multimedia Computer Components
- Multimedia Standards
- Multimedia PC.

Unit – 2: OVERVIEW OF COMPUTER GRAPHICS SYSTEM

- A survey of Computer Graphics
- Over View of Computer Graphics System
- Video display devices
- Raster Scan and random scan system
- Input devices
- Hard copy devices.

Unit – 3: OUTPUT PRIMITIVES AND ATTRIBUTES

- Drawing line, circle and ellipse generating algorithms
- Scan line algorithm
- Character generation – attributes of lines, curves and characters

Unit – 4: TWO DIMENSIONAL GRAPHICS TRANSFORMATION

- Two dimensional geometric transformations
- Windowing and Clipping
- Clipping of lines

Unit – 5: THREE DIMENSIONAL GRAPHICS TRANSFORMATION

- Three dimensional concepts – representations
- Polygon table, Quadric surfaces, Splines, Besier curves and surfaces
- Geometric and Modeling transformations
- Viewing
- Parallel and perspective projections.

Unit – 6: REMOVAL OF HIDDEN SURFACES

- Visible surface detection methods
- Computer animation

Text Books:

1. Tay Vaughan, "Multimedia making it works", 4th Edition Tata McGraw Hill Edition, 2000. **For Unit - 1**
2. Hearn, D. and Pauline Baker, M., "Computer Graphics", 2nd Edition, Prentice Hall of India, 1995.
(Sections: 1.1-1.8,2.1-2.3,2.5,2.6,3.1-3.7,3.11,3.14,4.1,4.2,4.5,5.1-5.5,6.1-6.7,9.1,9.2, 10.1-10.4, 10.6-10.8, 11.1-11.7, 12.1,12.3, 13.1-13.9, 13.12, 16.1-16.6)

References:

1. Neuman, W.M., and Sproull, R.F., "Principle of Interactive Computer Graphics", McGraw Hill Book Co., 1979.
2. Rogus, D.F., "Procedure elements for Computer Graphics", Mc - Graw Hill Book Co., 1985.
3. Asthana, R.G.S and Sinha, N.K. "Computer Graphics", New Age Int. Pub. (P) Ltd., 1996.

Unit 1: Introduction to .Net

- Framework Architecture
- Web Service Architecture
- SOAP & UDDI
- Authentication System: .Net Passport & .Net Alerts
- Securing Web Services: Built-in authentication, Role-based and Code-based security

Unit 2: Exchanging & Transforming Data

- Data representation with XML
- XML grammar and datatypes
- Transforming data using XSLT
- Xpath and XML Schema
- XML in .Net

Unit 3: Programming through C#

- Fundamentals of C#
- Data Abstraction
- Methods, Properties, Delegates and Events
- Creating .Net Framework Component
- Creating Web Services

Unit 4: Server Side Scripting under .Net (ASP .NET)

- Webforms
- Handling page events
- Validation Controls and Web Controls
- Creating ASP.Net client using C#
- Caching and Security Features

Unit 5: Database Access – ADO.NET

- Connection Object
- DataReader, DataAdapter, DataSet, DataRelation Objects
- Sorting, Searching and Filtering
- Updating changes to the database
- Creating database application using c# and ado.net

Unit 6: Advanced .Net Concepts

- Garbage Collection
- Remoting and Reflection
- Localization and Serialiation
- Security
- Introduction to mobile.net

Reference Books:

- | | |
|----------------------------------------------------------------------------|-------------------|
| 1. Introduction to Microsoft .Net | David S. Platt |
| 2. Microsoft Visual Studio .Net | Microsoft Press |
| 3. Designing Microsoft ASP.Net Applications | Douglas J. Reilly |
| 4. Developing Web Applications with Microsoft Visual Basic .Net and C#.Net | Microsoft Press |
| 5. Microsoft Visual C#.Net | Mikey Williams |
| 6. XML Step by Step | Michael J Young |
| 7. Microsoft ADO.Net | David Sceppa |
| 8. XML Programming | R. Allen Wyke |
| 9. Programming Microsoft Windows with C# | Charles Petzold |
| 10. Building Secure Microsoft ASP.Net Applications | Microsoft Press |
| 11. Relevant Manuals of Software | |

**FOR III SEMESTER ALREADY 3 SUBJECTS IN ELECTIVE
ADDING
4TH ELECTIVE
M.Sc (INFORMATION TECHNOLOGY)
PS03EINTO4**

MOBILE APPLICATION DEVELOPMENT USING ANDROID AND WINDEV

Syllabus

Unit - 1: Introduction to Android

Introduction to Android
Standard development environment for Android applications
Installing Android
Creating Hello World and running application on Emulator
Android Architectural Overview and Android Development Framework
Introduction to Android tools
Structure of Android application
Components of Android

Unit - 2: Introduction to Activities and User Interface Design

Introduction to activity
Activity lifecycle phases
Introducing Toast
Introduction to Views and layouts and Common UI components
Input and Selection components
Adapters
Menus and Dialogs
Working with Intents
Types of Resources

Unit – 3: Introduction to Content Provider and Sqlite Database

File systems
Persistent storage in Android
Android databases
Storing and retrieving data
Content provider Classes

Unit – 4: Introduction to WinDev

Introduction to WinDev Mobile versions
Features of WinDev Mobile
Types of mobile application in WinDev Mobile
Introduction to WinDev Mobile IDE
Using WinDev Mobile for Android application development

Unit – 5: Introduction to development Language (WLanguage)

Introduction to WLanguage
Declaring and using variables
Data Types
Types of Operators
Conditional statements
Iterative Statements
Introduction to OOP concepts

Unit – 6: Introduction to Database in WinDev Mobile

Introduction to database in WinDev Mobile
Inserting a record in to database
Deleting a record in to database
Updating a record in to database
Design Sample Application

Reference Book:

Main

- *Beginning Android Application Development By Wei-Meng Lee, Wiley Publishing, Inc, Wrox Programmer to Programmer*
- *Online WinDev Documentation, <http://www.windev.com/pcsoft/documentations.html>*

Other

Paper No : IT-306
Paper Title : Practical based on IT-301 & IT-305

Practical are based on Paper No. – 301 and Paper No. – 305

M. Sc. (Information Technology) – 4th Semester Syllabus

The whole Semester is for Project Work of 6 months duration and for preparation of Seminar work.

SARDAR PATEL UNIVERSITY

Teaching and Evaluation scheme for M. Sc. (Information Technology) 1st Semester

Paper No.	Paper Title	Teaching Schedule				Evaluation Scheme		
						University Examination		Internal Evaluation
		Lect.	Tut	Prac	Credit	Duration	Marks	Marks
101	Introduction to Information Science	3	1	-	4	3	70	30
102	Advanced Programming Concepts & Data Structures	3	1	-	4	3	70	30
103	Introduction to Theoretical Computer Science	3	1	-	4	3	70	30
104	RDBMS & Client Server Computing	3	1	-	4	3	70	30
105	Operating System Concepts	3	1	-	4	3	70	30
106	Practical based on 102 & 104	-	-	10	5	5	70	30

Sardar Patel University

Teaching and Evaluation scheme for M. Sc. (Information Technology) 2nd Semester

Paper No.	Paper Title	Teaching Schedule				Evaluation Scheme		
						University Examination		Internal Evaluation
		Lect.	Tut	Prac	Credit	Duration	Marks	Marks
201	Modern MIS Techniques	3	1	-	4	3	70	30
202	Systems and Information Concepts in Organization	3	1	-	4	3	70	30
203	Software Engineering	3	1	-	4	3	70	30
204	Visual Programming	3	1	-	4	3	70	30
205	Web Programming	3	1	-	4	3	70	30
206	Practicals based on 204 & 205	-	-	10	5	5	70	30

Elective Subject:

202 E-Commerce and M-Commerce **OR** Trends in ICT

Sardar Patel University

Teaching and Evaluation scheme for M. Sc. (Information Technology) 3rd Semester

Paper No.	Paper Title	Teaching Schedule				Evaluation Scheme		
						University Examination		Internal Evaluation
		Lect.	Tut	Prac	Credit	Duration	Marks	Marks
301	Java Programming	3	1	-	4	3	70	30
302	Data Communication and Networking	3	1	-	4	3	70	30
303	Information Security	3	1	-	4	3	70	30
304	Artificial Intelligence	3	1	-	4	3	70	30
305	Distributed Application Development Technology	3	1	-	4	3	70	30
306	Practicals based on 301 & 305	-	-	10	5	5	70	30

Elective Subject:

304 Data Mining and Data Warehousing **OR** Multimedia and Computer Graphics **OR** Mobile Application Development Using Android and Windev

Page 2 for (4th Semester M.Sc (IT))

Sardar Patel University

Teaching and Evaluation scheme for M. Sc. (Information Technology) 4th Semester

Examination: Based on Project Viva & Seminar
Marks: 400 & 200 Respectively

Paper No.	Paper Title	Evaluation Scheme		
		University Examination	External	Internal
		Credit	Marks	Marks
PS04CINT01	Project Work	18	280	120
PS04CINT02	Seminar	7	140	60