Savitribai Phule Pune University
Faculty of Science & Technology

Curriculum

For
Bachelor of Vocational (Engg)
Second and Third Year Software Development
(Choice Based Credit System) (2019 Course)

(With Effect from Academic Year 2020-21)

B. Voc Software Development Syllabus for Second Year-

Sr. No.	Course Code	Name of the Course	Teaching Scheme			Evaluation Scheme			Credits	Total Marks
			L	T	P	IA	MSE	ESE		
Structure of sem –I										
General Education										
		Theory								
1		Linux Operating System – Operations and Management	3			50		50	3	100
2		Software Engineering	3			50		50	3	100
3		Web Development using PHP	3			50		50	3	100
4		Windows Development Fundamental	3			50		50	3	100
		Total							**12**	**400**
Skill Components										
		Lab/Practical								
5		Web Development using PHP Lab			1	25		50	1.5	75
		Window Development Fundamentals Lab			1	25		50	1.5	75
		On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)							**Group GSD2**	
7		Junior Data Associate (SSC/Q0401)							15	200
8		IP Executive (SSC/Q6201)	200 (Any one)							
9		Security Analyst (SSC/Q0901)								
		Total							**30**	**750**

B. Voc Software Development Syllabus for Second Year-

<table>
<tr><th colspan="11">Structure of sem –II</th></tr>
<tr><th rowspan="2">Sr. No.</th><th rowspan="2">Course Code</th><th rowspan="2">Name of the Course</th><th colspan="3">Teaching Scheme</th><th colspan="3">Evaluation Scheme</th><th rowspan="2">Credits</th><th rowspan="2">Total Marks</th></tr>
<tr><th>L</th><th>T</th><th>P</th><th>IA</th><th>MSE</th><th>ESE</th></tr>
<tr><td colspan="11">General Education</td></tr>
<tr><td></td><td></td><td colspan="9" align="center">Theory</td></tr>
<tr><td>1</td><td></td><td>Software Testing and Project Management</td><td>3</td><td></td><td></td><td>50</td><td></td><td>50</td><td>3</td><td>100</td></tr>
<tr><td>2</td><td></td><td>Android Application Development</td><td>3</td><td></td><td></td><td>50</td><td></td><td>50</td><td>3</td><td>100</td></tr>
<tr><td>3</td><td></td><td>Window Configuration and Server Administration</td><td>3</td><td></td><td></td><td>50</td><td></td><td>50</td><td>3</td><td>100</td></tr>
<tr><td>4</td><td></td><td>Management Information Systems</td><td>3</td><td></td><td></td><td>50</td><td></td><td>50</td><td>3</td><td>100</td></tr>
<tr><td></td><td></td><td>Total</td><td></td><td></td><td></td><td></td><td></td><td></td><td>12</td><td>400</td></tr>
<tr><td colspan="11">Skill Components</td></tr>
<tr><td></td><td></td><td colspan="9" align="center">Lab/Practical</td></tr>
<tr><td>5</td><td></td><td>Android Application Development Lab</td><td></td><td></td><td>1</td><td>25</td><td></td><td>50</td><td>1.5</td><td>75</td></tr>
<tr><td></td><td></td><td>MIS Lab</td><td></td><td></td><td>1</td><td>25</td><td></td><td>50</td><td>1.5</td><td>75</td></tr>
<tr><td colspan="9">On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)</td><td colspan="2">Group GSD2</td></tr>
<tr><td>7</td><td></td><td>QA Engineer (SSC/Q1302)</td><td colspan="6" rowspan="2" align="center">200 (Any one)</td><td>15</td><td>200</td></tr>
<tr><td>8</td><td></td><td>Software Engineer (SSC/Q4601)</td><td></td><td></td></tr>
<tr><td colspan="9" align="right">Total</td><td>30</td><td>750</td></tr>
</table>

B. Voc Software Development Syllabus for Third Year-

Sr. No.	Course Code	Name of the Course	Teaching Scheme			Evaluation Scheme			Credits	Total Marks
			L	T	P	IA	MSE	ESE		
Structure of sem –I										
General Education										
		Theory								
1		Technology Trends in IT	3			50		50	3	100
2		Window Mobile Application Development	3			50		50	3	100
3		Introduction to Python Programming	3			50		50	3	100
4		Introduction to Microprocessors	3			50		50	3	100
		Total							**12**	**400**
Skill Components										
		Lab/Practical								
5		Window Mobile Application Development Lab			1	25		50	1.5	75
		Python Programming Lab			1	25		50	1.5	75
		On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)							**Group GSD2**	
7		Management Trainee (SSC/Q6301)	200 (Any one)						15	200
8		Associate - Transactional F&A (SSC/Q2301)								
9		Consultant Network Security (SSC/Q0917)								
								Total	**30**	**750**

B

B. Voc Software Development Syllabus for Third Year-

Structure of Sem –II										
Sr. No.	Course Code	Name of the Course	Teaching Scheme			Evaluation Scheme			Credits	Total Marks
			L	T	P	IA	MSE	ESE		
General Education										
		Theory								
1		Introduction to AI	3			50		50	3	100
2		e-Commerce	3			50		50	3	100
3		Computer Network Security	3			50		50	3	100
4		Introduction to Biometrics	3			50		50	3	100
		Total							**12**	**400**
Skill Components										
		Lab/Practical								
5		AI Lab			1	25		50	1.5	75
		Computer Network Security Lab			1	25		50	1.5	75
		On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I)							**Group GSD2**	
7		Master Trainer for Software Developer (SSC/Q0509)	200 (Any one)						15	200
8		Hardware Engineer (SSC/Q4701)								
9										
								Total	**30**	**750**

Detailed Curriculum

Level 6 (Semester I)

(6.GV.01) Linux Operating System - Operations & Management

UNIT – I

Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell.

Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, more, less, creating and viewing files, using cat, file comparisons, View files, disk related commands, checking disk free spaces.

Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down.

UNIT–II

Essential Linux commands Understanding shells, Processes in Linux process fundamentals, connecting processes with pipes, redirecting input output, manual help, Background processing, managing multiple processes, changing process priority, scheduling of processes at command, batch commands, kill, ps, who, sleep, Printing commands, grape, fgrep, find, sort, Cal, banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc.

Mathematical commands- bc, expr, factor, units.

vi, joe, vim editor

UNIT–III

Shell programming Basic of shell programming, Various types of shell, shell programming in bash, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, shell keywords, Creating Shell programs for automate system tasks and report printing, use of grep in shell, awk programming.

UNIT–IV

System administration Common administrative tasks, identifying administrative files – configuratinn and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performance file security & Permissions, becoming super user using su.Getting system information - host name, disk partitions & sizes, users, kernel.

Backup and restore files, linuxconf. utility in GUI, reconfiguration hardware with kudzu Configure desktop-X configurator, understanding XF86config file, starting & using X desktop. KDE & Gnome graphical interfaces, changing X settings.

UNIT–V

Basic networking administration Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to internet, administration in a networked environment, common networking administrative tasks, the network file system, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands a TCP/IP networks, DNS services, routing using Linux, SLIP & PPP services, UUCP.

Installation & Administration of mail server, ftp server and Apache web server.

(6.GV.02)Software Engineering

UNIT - I
SOFTWARE **:** Software Characteristics, Components & Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & Rad Model., Evolutionary Software Process Model – Incremental Model and Spiral Model.
SOFTWARE PROJECT MANAGEMENT: Project Management Concepts – People Problem and Process S/W process and Project Metrics : Metrics in The Process and Project Domains . Software Measurement – Size Oriented, Function Oriented Metrics, Extended Function

UNIT - II
SOFTWARE PROJECT PLANNING: Objectives, Scope, Project Estimation, Decomposition Techniques, Empirical Estimation Models.
ANALYSIS CONCEPT AND PRINCIPLES: Requirement Analysis, Communication Techniques, Analysis Principles, Software Prototyping, Specifications.
ANALYSIS MODELING: Elements of The Analysis Modeling, Data Modeling. Functional Modeling and Information Flow, Behavioral Modeling, Data Dictionary.

UNIT – III
DESIGN CONCEPTS AND PRINCIPLES: Design Process, Design Concepts, Design Principles, Effective Modular Design. DESIGN METHODS : Architectural Design Process, Transform Mapping and Transaction Mapping, Interface Design, - Internal and External Design, Human Computer Interface Design, Interface Design Guidelines, Procedural Design.

UNIT - IV
S/W Quality Assurance : Quality Concepts, Matrix for Software Quality, Quality Movement, S/W Q A, S/W Review, Formal Technical Reviews, Formal Approaches to SQA, S/W Reliability, ISO 9000 quality Standards S/W TESTING MODELS : S/W Testing Fundamentals, Test Case Design, White and Black Box Testing, Basic Path Testing, Control Structure
S/W TESTING STRATEGIES : Strategic Approach To S/W Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Debugging

UNIT - V
S/W REUSE : Reuse Process, Building Reuse Components, Classified And Retrieving Components, Economics Of S/W Reuse COMPUTER AIDED S/W ENGINEERING: Introducing of Case, Building Block For Case, Taxonomy Of Case Tools, Integrating Case Environment, Integrating Architecture, Case Repository.

Reference Books:
1. Software Engineering, N.S. Gill, Khanna Publishing House
2. Software Engineering, R.P. Mahapatra, Khanna Publishing House

(6.GV.03)Web Development using PHP

UNIT I
Introduction to PHP as a programming Language: - Advantages of PHP, the server side architecture Decomposed, overview of PHP, history, object oriented support, benefits in running PHP as a server side script. Installing a web server, Internet information server, and IIS installation, testing web server setup.

UNIT II
The basics of PHP: - data types, variables, constants, operators, Arrays, Conditional statements (if statement, Executing Multiple Statements, else if clause and switch

statement), Iterations (for loop, while loop, controlling an array using a while loop, do while statement, for each loop and special loop key words)

UNIT III
Functions, user defined functions, functions with arguments, built in functions (print(), includer(), header(), phpinfo()), PHP server Variables, working with date and time , performing mathematical operations , working with string functions . System Variable (GET, POST, cookies& Session, Forums)

UNIT IV
Working with forms, form elements (Text Box, Text Area, Password, Radio Button, Checkbox, The Combo Box, Hidden Field and image), adding elements to a form, uploading files to the Web Server using PHP, building a challenge and response subsystem and understanding the functionality of the FORM attribute Method Regular Expressions: - Engine, types of Regular Expressions, symbols used in Regular Expressions. Error handling in PHP: - Displaying errors, warnings, types of errors, error levels in PHP, logging Errors and Ignoring errors.

UNIT V
Data base connectivity using PHP (MySQL, ODBC, ORACLE, SQL) Performing, executing Commands, different types of Data Base Operations like Insertion, deletion, update and query on data

Reference Books:
1. Mastering PHP, WebTech Solutions, Khanna Publishing House
2. Learning PHP, Ramesh Bangia, Khanna Publishing House

(6.GV.04)Window Development Fundamentals

- Programming web applications
- Working with data and services
- Troubleshooting and debugging web applications
- Working with client-side scripting
- Configuring and deploying web applications
- Understanding core programming
- Understanding object-oriented programming
- Understanding general software development
- Understanding web applications
- Understanding desktop applications
- Understanding databases

Reference Books:
1. Internet and Web Development, Soma Das Gupta, Khanna Publishing House

(6.VP.01) Web Development using PHP Lab

PHP programming language and 2D, 3D animation based on the theory covered in class.

(6.VP.02) Window Development Fundamentals Lab

- Client-side scripting Programs
- Deploying web applications
- Basic object-oriented programs
- Understanding desktop applications
- Basic SQL Queries

Level 6 (Semester II)

(6.GV.05) Software Testing & Project Management

UNIT - I
Testing basics and Development Models: Principals and context of testing in software production, Usability and Accessibility Testing, Phases of Software Project, Process models to represents different phases, Software Quality Control and its relation with testing, validating and verification, Software Development life cycle models, various development models.
White Box Testing: White Box Testing - Static Testing, Structural Testing-Unit code functional testing, Code coverage testing, code complexity testing,
Black Box Testing- What? Why and when to do Black box testing, Requirements based testing, Positive and Negative Testing, Boundary value testing, Decision Tables, Equivalence Partitioning, State Based or Graph Based Testing, Compatibility Testing, User Documentation Testing, Domain Testing.

UNIT - II
Integration Testing: Introduction and types of integration testing, Scenario testing, defect bash. **System and Acceptance Testing-** Overview, functional and non-functional testing, Acceptance testing.
Overview of some software testing tools: WinRunner, LoadRunner, Test Director.
(Some practical should be conducted using these tools)

UNIT- III
Performance Testing- Introduction, factors related to performance testing, methodology for performing testing, Regression Testing,
Ad hoc Testing- Overview, Buddy & pair testing, Exploratory testing, Interactive testing, Agile and extreme testing.
Testing of Object Oriented Testing – Introduction, Differences in OO testing.

UNIT – IV
Software Project Management: Overview, Software Project Management Framework, Software Development life cycle,
Organization Issues and Project Management, Managing Processes, Project Execution, Problems in Software Projects, Project Management Myths and its clarifications.
Software Project Scope: Need to scope a software project, scope management process, communication techniques and tools, communication methodology
Software Requirement Gathering and Resource allocation: Requirement specifications, SRS Document preparation, Resources types for a software projects, requirement for resources allocation.

UNIT – V
Software Project Estimation: Work Breakdown structure (WBS), steps in WBS, Measuring efforts for a project, techniques for estimation – SLOC, FP, COCOMO and Delphi methods.
Project Scheduling: Scheduling and its need, scheduling basics, Gannt Chart, Network scheduling techniques, Pert and CPM
Using a Project Management Tool: Introduction to MS Project 2000, Managing tasks in MS Project 2000, Tracing a project plan, creating and displaying project information reports.

(6.GV.06) Android Application Development

UNIT-I

Android Introduction, Smartphones future, Preparing the Environment, Installing the SDK, Creating Android Emulator, Installing and Using Eclipse, Installing Android Development Tools, Choosing which Android version to use
Android Architecture, Android Stack, Android applications structure
Creating a project, Working with the AndroidManifest.xml, Using the log system Activities Introduction to UI – Layouts, Fragments, Adapters, Action bar, Dialogs, Notifications , UI best practices
UI Architecture, Application context, Intents, Activity life cycle, Supporting multiple screen sizes

Unit - II

Designing User Interface Using Views – Basic Views- TextView, Button, Image Button, Check Box, Toggle Button, Radio Button etc., Progress Bar View and Auto Complete Text View, Time Picker and Date Picker View, List View,
Image View, Image Switcher and Grid View, Digital Clock & Analog Clock Views
Notification and Toast, Parameters , on Intents, Pending intents, Status bar notifications
Toast notifications

UNIT-III

Menus, Localization, Options menu, Context menu
Dialogs-Alert dialog, Custom dialog, Dialog as Activity
Orientation and Movement- Pitch, roll and yaw, Natural device orientation, Reference frame remapping
SMS - Sending and Receiving
Working with Media –Playing audio and video, Recording audio and video

UNIT-IV

Location and Maps - Google maps, Using GPS to find current location
Working with data storage - Shared preferences, Preferences activity, Files access, Using External storage, SQLite database
Animation-View animation, Drawable animation
Working with Sensors- Finding sensors, Accelerometers, Gyroscopes, Other types Working with Camera – Controlling the camera, Preview and overlays, Taking pictures

UNIT-V

Content providers- Content provider introduction, Query providers
Network Communication - Web Services, HTTP Client, XML and JSON, Using e-mails.
Services - Service lifecycle, Foreground service, Creating own services
Publishing and Distributing Your App -Preparing for publishing, Google Play requirements,
Signing and preparing the graphics, Publishing to the Android Market, Monetization, Tips on becoming a top app, Google analytics

Reference Books:
1. Learning Android, Ramesh Bangia, Khanna Publishing House

(6.GV.07) Windows Configuration and Server Administration

Understanding Windows Programming Basics: Identify Windows application types, Implement user interface design.
Creating Windows Forms Applications: Create and handle events, Understand Windows Forms inheritance, understand how to create new controls and extend existing controls, Validate and

implement user input, Debug a Windows-based application.

Creating Windows Services Applications: Create a Windows Services application, Installa Windows Services application.

Accessing Data in a Windows Forms Application: Understand data access methods for a Windows Application, Understand data bound controls.

Deploying a Windows Application: Understand windows application deployment methods, integrating data.

Network basics: Type of Networks, Topologies, Transmission media, Install UTP(Straight, Cross, Rollover Cables), IP Addressing, Subneting, OSI Model, TCP/IP Model, Wireless Network, Network Devices.

Installation: Installation Server, Drivers, Working with windows server Devices, Troubleshooting Devices & Drivers, Managing system updates.

Working With Disk Storage: Type of Disk Storage, Type of volumes, Implementing fault tolerance, Use disk management tools, Disk Quota, Troubleshooting disk management, Shadow copy**.**

Domain Controller: Install Active Directory, Manage Active Directory Component, Working with OU Structure, Working with Domain User account, Working with Domain Groups, Troubleshooting Active Directory.

Domain Name Services (DNS): Define Name resolution, Install DNS, Configure DNS Client, Manage and Troubleshoot DNS.

Dynamic Host Configuration Protocol: Configure DNS Server, Working With Super Scope, Configure DHCP Client, Manage and Troubleshoot DHCP Server.

Backup and Restore: Requirement for Backup and Recovery AD, Issue for AD Backup and Recovery, Steps for Backup and Recovery AD.

(6.GV.08) Management Information System

Unit I
An introduction to information systems, Information systems in organizations, Information Technology Concepts, The IS Revolution; Information requirement for the different levels lf management, transaction processing system, Management information 34 system, Decision support system. Strategic Role of Information Systems. Business Processes; Information management, and Decision Making. Computers and Information Processing;

Unit II
Transaction processing system; hardware and software requirements, tools used, case studies, merits and demerits of transaction processing system.

Unit III
Managerial control, Information and tools required, difference between transactional system and managerial system. Frequency of taking outputs, Need for interconnected system, common database, Redundancy control, case studies. Decision support system, concept and tools, case studies, virtual organizations, strategic decisions-unstructured approach, cost and values of unstructured information.

Unit IV
Optimization techniques, difference between optimization tools and DSS tools expert system, difference between expert system and management information system. Role of chief Information officer.

(6.VP.03) Android Application Development Lab

1. Write a simple Application which will print "Hello World!"
2. Write a simple Application that uses UI Layout and Control.

3. Write a simple Application that makes use of Style & Themes.
4. Write a simple Application that uses Event Handling.
5. Write a simple Application that uses Alarm, Notification.
6. Make a location based app.
7. Write a program that shows the use animation.
8. Write a program that shows the use of Image Effects.
9. Write a program that shows the use Image Switcher.
10. Write a program that shows the use of database.

(6.VP.04) MIS Lab

Experiments to be covered based on the theory covered in class

Level 7 (Semester I)

(7.GV.01)Technology Trends in IT

Unit-I
Internet of Things (IoT) – Definition of IoT, History of IoT, IoT vs. similar concepts, Application/Segment overview, Technology overview

Unit-II
Big Data Analytics: Concepts, examples of big data analytics, benefits of big data analytics, Technologies, and Applications, requirements for being successful with big data analytics

Unit-III
Cloud Computing – Introduction, Why cloud services are popular, advantages, Characteristics, Service models, Deployment of cloud services, Potential privacy risks

Unit-IV
Cyber Security – Introduction, risks, Malicious code, Hacker, attacker or intruder, Cyber security Principles, Information Security (IS) within Lifecycle Management, Risks & Vulnerabilities, Incident Response, Future Implications & Evolving Technologies

Unit-V
Wearable Technologies – Introduction, Applications of Wearable Technology, Challenges to Wearable Technology, various Wearable devices.

Reference Books:
1. Computer Today, A. Ravichandran, Khanna Publishing House
2. Internet of Things, Jeeva Jose, Khanna Publishing House
3. Big Data and Hadoop, V.K. Jain, Khanna Publishing House
4. Data Sciences and Analytics, V.K. Jain, Khanna Publishing House

(7.GV.02)Windows Mobile Application Development

Unit-I

INTRODUCTION TO WINDOWS 8 APPLICATION DEVELOPMENT - brief history of windows application development, History of APIs and Tools, Operating System Input Methods
The Windows Charm Bar, Start Button, Search Button, Share Button, Devices Button, Settings Button, Windows Desktop, Switching between Desktop Programs

WINDOWS 8 ARCHITECTURE FROM A DEVELOPER'S POINT OF VIEW - Windows 8 Development Architecture, Desktop Application Layers, Understanding Windows Runtime: Windows Runtime Architecture Overview, Metadata in Windows Runtime, .NET Framework 4.5: The Installation Model of .NET Framework 4.5, Window Runtime Integration, Picking the Appropriate Technology for Your Project, Choosing a Programming Language

GETTING TO KNOW DEVELOPMENT ENVIRONMENT - Introducing the Toolset, Visual Studio IDE: Creating a New Project, Lighting Up Your Applications with Expression Blend

UNIT-II

PRINCIPLES OF MODERN WINDOWS APPLICATION DEVELOPMENT - Windows 8 Style Application, Windows 8 Design Language, Introduction to Asynchronous Programming, Evolution of Asynchronous, Programming on the .NET Platform

CREATING WINDOWS 8 STYLE APPLICATIONS WITH HTML5, CSS, AND JAVASCRIPT - HTML5 and CSS on the Web, HTML5 Technologies, HTML5 Applications on Windows Runtime, The Windows Library for JavaScript (WinJS), Creating Windows 8 Style Applications with JavaScript, Accessing the Filesystem, Managing Data, Respecting the User's Device

UNIT-III

USING XAML TO CREATE WINDOWS 8 STYLE USER INTERFACES - Describing the User Interface Using XAML, Using Namespaces, Understanding the Layout Management System, Reusable Resources in XAML, Basic Controls in Windows 8 Style Applications: Controls with Simply Accessing the Internet: e Values, Content Controls, Working with Data: Data Binding Dependency Properties and Notifications, Binding Modes and Directions

WORKING WITH XAML CONTROLS - Using Animations in Application, Designing the Visual Look of a Control, Working with Complex Controls: Getting to Know the List View Base Controls, Using the Grid View Control, Binding to Data, Grouping Data, Defining Visual Groups

BUILDING WINDOWS 8 STYLE APPLICATIONS - The Lifecycle of a Windows 8 Application, Deploying Windows 8 Apps, Commanding Surfaces, Persisting Application Data, Applications and the Start Screen

UNIT-IV

CREATING MULTI-PAGE APPLICATIONS - Navigation Basics, working with Pages, Using the Split Application and Grid Application Templates

BUILDING CONNECTED APPLICATIONS - Integrating with the Operating System and Other Apps: Picker Unified Design to Access Data, Understanding the Concept of Contracts, Accessing the Internet: Detecting the Changes of Internet Connectivity, Using Feeds, Accessing Windows Live LEVERAGING TABLET FEATURES - Accommodating Tablet Devices, Building Location-Aware Applications, Using Sensors: Using Raw Sensor Data, Using Sensor Fusion Data

UNIT-V

ADVANCED PROGRAMMING CONCEPTS - Building Solutions with Multiple Languages: Hybrid Solutions, Background Tasks: Understanding Background Tasks, How Background Tasks Work, Cancelling Background Tasks, Implementing Background Tasks, creating a Simple Background Task, Managing Task Progress and Cancelation, Input Devices

TESTING AND DEBUGGING WINDOWS 8 APPLICATIONS - The Quality of Software, Becoming Familiar with Debugging, Controlling the Program Flow in Debug Mode, Monitoring and Editing Variables, Changing the Code While Debugging, Windows 8 Style Application-Specific Scenarios, Introduction to Software Testing, Introduction to Unit Testing, Unit Testing Windows 8 Style Applications

INTRODUCING THE WINDOWS STORE - Getting to Know the Windows Store, How Customers See an App in the Windows Store, Application Details, Making Money with Your App, The Developer Registration Process: Submitting the Application, The Application Certification Process, The Windows App Certification Kit.

(7.GV.03) Introduction to Python Programming

- Familiarization with the basics of Python programming: a simple "hello world" program, process of writing a program, running it, and print statements; simple data-types: integer, float, string
- Introduce the notion of a variable, and methods to manipulate it (concept of L-value and R-value even if not taught explicitly)
- Knowledge of data types and operators: accepting input from the console, assignment statement, expressions, operators and their precedence.
- Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort numbers, and divisibility.
- Notion of iterative computation and control flow: for, while, flowcharts, decision trees and pseudo code; write a lot of programs: interest calculation, primarily testing, and factorials.
- Idea of debugging: errors and exceptions; debugging: pdb, break points.
- Lists, tuples and dictionary: finding the maximum, minimum, mean; linear search on list/tuple of numbers, and counting the frequency of elements in a list using a dictionary. Introduce the notion of accessing elements in a collection using numbers and names.
- Sorting algorithm: bubble and insertion sort; count the number of operations while sorting.
- Strings: compare, concat, substring; notion of states and transitions using state transition diagrams.

Reference Books:
1. Introduction to Computing and Problem Solving With Python, Jeeva Jose, Khanna Publishing House
2. Taming Python by Programming, Jeeva Jose, Khanna Publishing House

(7.GV.04) Introduction to Microprocessors

Digital Design and VHDL
1.1. Introduction
1.2. Combinational Logic
1.3. Structural Modeling
1.4. Sequential Logic
1.5. Finite State Machines
1.6. Parameterized Modules
1.7. Testbenches

2. Arithmetic Logic Unit (ALU)
2.1. Introduction
2.2. Arithmetic Circuits
2.3. ALU

2.4. Number Systems

3. Microprocessor I: Instruction Data Set. Machine Language
3.1. Introduction
3.2. Assembly Language
3.3. Machine Language
3.4. Programming
3.5. Addressing Modes
3.6. Lights, Camera, Action: Compiling, Assembling, and Loading
3.7. Odds and Ends

4. Microprocessor II: Control and Datapath Design. Single-Cycle Processor
4.1. Introduction
4.2. Performance Analysis
4.3. Single-Cycle Processor

5. Microprocessor III: Control and Datapath Design. Multi-cycle Processor
5.1. Introduction
5.2. Performance Analysis
5.3. Multicycle Processor
5.4. Pipelined Processor

6. Memory systems and I/O.
6.1. Introduction
6.2. Memory System
6.2.1. Caches
6.2.2. Virtual Memory
6.3. Memory-Mapped I/O
6.3.1. Memory map
6.3.2. I/O Devices
6.4. Buses and organization

Reference Books:
1. Fundamentals of Microprocessor, M.K. Ghodki, Khanna Publishing House
2. Advance Microprocessor, A.K. Gautam, Khanna Publishing House

(7.VP.01)Windows Mobile Application Development Lab

1. Working with J2ME Features
2. Threads & High level UI
3. Developing networked applications using the wireless toolkit
4. Authentication with a webserver
5. Study Windows API's. Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of windows programming.

(7.VP.02) Python Programming Lab

- Find the largest and smallest numbers in a list.

- Find the third largest number in a list.
- Test for primarily.
- Find whether a string is a palindrome or not.
- Given two integers x and n, compute x^n.
- Compute the greatest common divisor and the least common multiple of two integers.
- Test if a number is equal to the sum of the cubes of its digits. Find the smallest and largest such numbers

(7.GV.05) Introduction to AI

UNIT – I

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

UNIT - II

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation. Using Predicate Logic: Represent ting Simple Facts in logic, Representing instances and is-a relationship, Computable function and predicate.

UNIT - III

Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells. Knowledge acquisition: General concepts in knowledge acquisition, early work in Machine Learning, examples of Inductive Learners, computer vision, Robotics, overview of LISP- AI language.

Reference Books:
1. Artificial Intelligence, Munish Chandra Trivedi, Khanna Publishing House

(7.GV.06) e-Commerce

Unit I

Introduction E-Business: Origin and Need of E-Commerce, Factors affecting E -Commerce, Business dimension and technological dimension of E-Commerce, E-Commerce frame work Electronic Commerce Models, Value Chains in Electronic Commerce.

Unit II

Internet and E-Business: Introduction to Internet and its application, Intranet and Extranets. World Wide Web, Internet Architectures, Internet Applications, Business Applications on Internet, E - Shopping, Electronic Data Interchange, Components of Electronic Data Interchange, Creating Web Pages using HTML.

Unit III

Technology for Online Business: Internet, IT Infrastructure, Middleware Contents, Text and Integrating E-Business Applications, Mechanism of Making Payment Through Internet, Online Payment Mechanism, Electronic Payment Systems, Payment Gateways, Visitors to

Website, Tools for Promoting Website, Plastic Money, Debit Card, Credit Card, Laws Relating to Online Transactions.

Unit IV
Applications in E-commerce: E-commerce Applications in Manufacturing, Wholesale, Retail and Service Sector.

Reference Books:
1. E-Commerce, Sarika Gupta, Khanna Publishing House

(7.GV.07) Computer Network Security

UNIT-I
Network Concept, Benefits of Network, Network classification (PAN, LAN, MAN, WAN), Peer to Peer, Client Server architecture, Transmission media: Guided & Unguided, Network Topologies. Networking terms: DNS, URL, client server architecture, TCP/IP, FTP, HTTP, HTTPS, SMTP, Telnet OSI and TCP/IP Models: Layers and their basic functions and Protocols, Comparison of OSI and TCP/IP. Networking Devices: Hubs, Switches, Routers, Bridges, Repeaters, Gateways and Modems, ADSL.

UNIT-II
Ethernet Networking: Half and Full-Duplex Ethernet, Ethernet at the Data Link Layer, Ethernet at the Physical Layer. Switching Technologies: layer-2 switching, address learning in layer-2 switches, network loop problems in layer-2 switched networks, Spanning-Tree Protocol, LAN switch types and working with layer-2 switches, Wireless LAN

UNIT- III
Internet layer Protocol: Internet Protocol, ICMP, ARP, RARP. IP Addressing: Different classes of IP addresses, Sub-netting for an internet work, Classless Addressing. Comparative study of IPv4 & IPv6. Introduction to Router Configuration. Introduction to Virtual LAN.

UNIT- IV
Transport Layer: Functions of transport layer, Difference between working of TCP and UDP. Application Layer: Domain Name System (DNS), Remote logging, Telnet, FTP, HTTP, HTTPS. Introduction to Network Security.

Reference Books:
1. Information & Computer Security, Sarika Gupta, Khanna Publishing House
2. An Integrated Approach to Computer Networks, Bhavneet Sidhu, Khanna Publishing House

(7.GV.08) Introduction to Biometrics

Unit I
Concepts - biometric recognition, biometrics, requirements for biometrics
Biometric systems, their modes and architectures
Biometric system errors and evaluation

Unit II
Overview, comparison and evaluation of various biometrics
Unimodal biometric systems, their advantages, disadvantages and limits
Multimodal biometric systems, their modes of operation, levels of fusion

Unit III
Biometric pattern recognition methods
Privacy protection and social acceptance
Biometric standardization, data formats
Design and implementation of biometric systems, applications of biometric systems, biometric databases, security of biometric systems

(7.VP.03) AI Lab

1. Study of PROLOG.
2. Write a program to solve 8-queen's problem
3. Solve any problem using depth first search.
4. Solve any problem using best first search.
5. Solve 8-puzzle problem using best first search
6. Solve Robot (traversal) problem using means End Analysis
7. Solve traveling salesman problem.

(7.VP.04)Computer Network Security Lab

1. Identification of Connectors and Cables:
   a. Connectors: BNC, RJ-45, I/O box
   b. Cables: Co-axial, twisted pair, Optical fibre.
2. Identification of various networks components
   a. NIC (network interface card)
   b. Hub, Switch, Router.
3. Execution of basic networking Commands: Netstat, IPConfig, IfConfig, Ping, Arp-a, Nbtstat-a, Netdiag, Nslookup, Traceroute, Pathping
4. Design Ethernet Cables: Cross Cable, Straight Cable, Rollover Cable.
5. Demonstration to connect two computers with/without connecting device.
6. Demonstration of File sharing & Printer sharing.
7. Study of various topologies using topology trainer
8. Detailed study of Network and Internet Settings on PC.
9. Trouble shooting of networks & Installation of network device drivers.
10. Study of Router Configuration.
11. Logging into a router, Editing and Help features and Saving Router configuration.
12. Setting the Hostname, Descriptions, IP Address, and Clock Rate on a Router.

Detailed Curriculum

Level 6 (Semester I)

(6.GV.01) Linux Operating System - Operations & Management

UNIT – I

Linux introduction and file system - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell.

Linux File system-Boot block, super block, Inode table, data blocks, How Linux access files, storage files, Linux standard directories, Commands for files and directories cd, ls, cp, md, rm, mkdir, rmdir, more, less, creating and viewing files, using cat, file comparisons, View files, disk related commands, checking disk free spaces.

Partitioning the Hard drive for Linux, Installing the Linux system, System startup and shut-down.

UNIT–II

Essential Linux commands Understanding shells, Processes in Linux process fundamentals, connecting processes with pipes, redirecting input output, manual help, Background processing, managing multiple processes, changing process priority, scheduling of processes at command, batch commands, kill, ps, who, sleep, Printing commands, grape, fgrep, find, sort, Cal, banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc.

Mathematical commands- bc, expr, factor, units.

vi, joe, vim editor

UNIT–III

Shell programming Basic of shell programming, Various types of shell, shell programming in bash, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, shell keywords, Creating Shell programs for automate system tasks and report printing, use of grep in shell, awk programming.

UNIT–IV

System administration Common administrative tasks, identifying administrative files – configuratinn and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disable user's accounts, creating and mounting file system, checking and monitoring system performance file security & Permissions, becoming super user using su.Getting system information - host name, disk partitions & sizes, users, kernel.

Backup and restore files, linuxconf. utility in GUI, reconfiguration hardware with kudzu Configure desktop-X configurator, understanding XF86config file, starting & using X desktop. KDE & Gnome graphical interfaces, changing X settings.

UNIT–V

Basic networking administration Setting up a LAN using Linux, choosing peer to peer vs client/server model, setting up an Ethernet Lan, configuring host computers, checking Ethernet connecting, connecting to internet, administration in a networked environment, common networking administrative tasks, the network file system, configuring Ethernet, initializing Ethernet Interface, ifconfig, netstat and netconfig commands a TCP/IP networks, DNS services, routing using Linux, SLIP & PPP services, UUCP.

Installation & Administration of mail server, ftp server and Apache web server.

(6.GV.02)Software Engineering

UNIT - I
SOFTWARE **:** Software Characteristics, Components & Applications, Software Engineering - A Layered Technology, Software Process Models - Linear Sequential Model, Prototype & Rad Model., Evolutionary Software Process Model – Incremental Model and Spiral Model.
SOFTWARE PROJECT MANAGEMENT: Project Management Concepts – People Problem and Process S/W process and Project Metrics : Metrics in The Process and Project Domains . Software Measurement – Size Oriented, Function Oriented Metrics, Extended Function

UNIT - II
SOFTWARE PROJECT PLANNING: Objectives, Scope, Project Estimation, Decomposition Techniques, Empirical Estimation Models.
ANALYSIS CONCEPT AND PRINCIPLES: Requirement Analysis, Communication Techniques, Analysis Principles, Software Prototyping, Specifications.
ANALYSIS MODELING: Elements of The Analysis Modeling, Data Modeling. Functional Modeling and Information Flow, Behavioral Modeling, Data Dictionary.

UNIT – III
DESIGN CONCEPTS AND PRINCIPLES: Design Process, Design Concepts, Design Principles, Effective Modular Design. DESIGN METHODS : Architectural Design Process, Transform Mapping and Transaction Mapping, Interface Design, - Internal and External Design, Human Computer Interface Design, Interface Design Guidelines, Procedural Design.

UNIT - IV
S/W Quality Assurance : Quality Concepts, Matrix for Software Quality, Quality Movement, S/W Q A, S/W Review, Formal Technical Reviews, Formal Approaches to SQA, S/W Reliability, ISO 9000 quality Standards S/W TESTING MODELS : S/W Testing Fundamentals, Test Case Design, White and Black Box Testing, Basic Path Testing, Control Structure
S/W TESTING STRATEGIES : Strategic Approach To S/W Testing, Unit Testing, Integration Testing, Validation Testing, System Testing, Debugging

UNIT - V
S/W REUSE : Reuse Process, Building Reuse Components, Classified And Retrieving Components, Economics Of S/W Reuse COMPUTER AIDED S/W ENGINEERING: Introducing of Case, Building Block For Case, Taxonomy Of Case Tools, Integrating Case Environment, Integrating Architecture, Case Repository.

Reference Books:
3. Software Engineering, N.S. Gill, Khanna Publishing House
4. Software Engineering, R.P. Mahapatra, Khanna Publishing House

(6.GV.03)Web Development using PHP

UNIT I
Introduction to PHP as a programming Language: - Advantages of PHP, the server side architecture Decomposed, overview of PHP, history, object oriented support, benefits in running PHP as a server side script. Installing a web server, Internet information server, and IIS installation, testing web server setup.

UNIT II
The basics of PHP: - data types, variables, constants, operators, Arrays, Conditional statements (if statement, Executing Multiple Statements, else if clause and switch

statement), Iterations (for loop, while loop, controlling an array using a while loop, do while statement, for each loop and special loop key words)

UNIT III

Functions, user defined functions, functions with arguments, built in functions (print(), includer(), header(), phpinfo()), PHP server Variables, working with date and time , performing mathematical operations , working with string functions . System Variable (GET, POST, cookies& Session, Forums)

UNIT IV

Working with forms, form elements (Text Box, Text Area, Password, Radio Button, Checkbox, The Combo Box, Hidden Field and image), adding elements to a form, uploading files to the Web Server using PHP, building a challenge and response subsystem and understanding the functionality of the FORM attribute Method Regular Expressions: - Engine, types of Regular Expressions, symbols used in Regular Expressions. Error handling in PHP: - Displaying errors, warnings, types of errors, error levels in PHP, logging Errors and Ignoring errors.

UNIT V

Data base connectivity using PHP (MySQL, ODBC, ORACLE, SQL) Performing, executing Commands, different types of Data Base Operations like Insertion, deletion, update and query on data

Reference Books:
3. Mastering PHP, WebTech Solutions, Khanna Publishing House
4. Learning PHP, Ramesh Bangia, Khanna Publishing House

(6.GV.04)Window Development Fundamentals

- Programming web applications
- Working with data and services
- Troubleshooting and debugging web applications
- Working with client-side scripting
- Configuring and deploying web applications
- Understanding core programming
- Understanding object-oriented programming
- Understanding general software development
- Understanding web applications
- Understanding desktop applications
- Understanding databases

Reference Books:
2. Internet and Web Development, Soma Das Gupta, Khanna Publishing House

(6.VP.01) Web Development using PHP Lab

PHP programming language and 2D, 3D animation based on the theory covered in class.

(6.VP.02) Window Development Fundamentals Lab

- Client-side scripting Programs
- Deploying web applications
- Basic object-oriented programs
- Understanding desktop applications
- Basic SQL Queries

Level 6 (Semester II)

(6.GV.05) Software Testing & Project Management

UNIT - I

Testing basics and Development Models: Principals and context of testing in software production, Usability and Accessibility Testing, Phases of Software Project, Process models to represents different phases, Software Quality Control and its relation with testing, validating and verification, Software Development life cycle models, various development models.

White Box Testing: White Box Testing - Static Testing, Structural Testing-Unit code functional testing, Code coverage testing, code complexity testing,

Black Box Testing- What? Why and when to do Black box testing, Requirements based testing, Positive and Negative Testing, Boundary value testing, Decision Tables, Equivalence Partitioning, State Based or Graph Based Testing, Compatibility Testing, User Documentation Testing, Domain Testing.

UNIT - II

Integration Testing: Introduction and types of integration testing, Scenario testing, defect bash. **System and Acceptance Testing-** Overview, functional and non-functional testing, Acceptance testing.

Overview of some software testing tools: WinRunner, LoadRunner, Test Director.

(Some practical should be conducted using these tools)

UNIT- III

Performance Testing- Introduction, factors related to performance testing, methodology for performing testing, Regression Testing,

Ad hoc Testing- Overview, Buddy & pair testing, Exploratory testing, Interactive testing, Agile and extreme testing.

Testing of Object Oriented Testing – Introduction, Differences in OO testing.

UNIT – IV

Software Project Management: Overview, Software Project Management Framework, Software Development life cycle,

Organization Issues and Project Management, Managing Processes, Project Execution, Problems in Software Projects, Project Management Myths and its clarifications.

Software Project Scope: Need to scope a software project, scope management process, communication techniques and tools, communication methodology

Software Requirement Gathering and Resource allocation: Requirement specifications, SRS Document preparation, Resources types for a software projects, requirement for resources allocation.

UNIT – V

Software Project Estimation: Work Breakdown structure (WBS), steps in WBS, Measuring efforts for a project, techniques for estimation – SLOC, FP, COCOMO and Delphi methods.

Project Scheduling: Scheduling and its need, scheduling basics, Gannt Chart, Network scheduling techniques, Pert and CPM

Using a Project Management Tool: Introduction to MS Project 2000, Managing tasks in MS Project 2000, Tracing a project plan, creating and displaying project information reports.

(6.GV.06) Android Application Development

UNIT-I

Android Introduction, Smartphones future, Preparing the Environment, Installing the SDK, Creating Android Emulator, Installing and Using Eclipse, Installing Android Development Tools, Choosing which Android version to use

Android Architecture, Android Stack, Android applications structure

Creating a project, Working with the AndroidManifest.xml, Using the log system Activities Introduction to UI – Layouts, Fragments, Adapters, Action bar, Dialogs, Notifications , UI best practices

UI Architecture, Application context, Intents, Activity life cycle, Supporting multiple screen sizes

Unit - II

Designing User Interface Using Views – Basic Views- TextView, Button, Image Button, Check Box, Toggle Button, Radio Button etc., Progress Bar View and Auto Complete Text View, Time Picker and Date Picker View, List View,

Image View, Image Switcher and Grid View, Digital Clock & Analog Clock Views

Notification and Toast, Parameters , on Intents, Pending intents, Status bar notifications

Toast notifications

UNIT-III

Menus, Localization, Options menu, Context menu

Dialogs-Alert dialog, Custom dialog, Dialog as Activity

Orientation and Movement- Pitch, roll and yaw, Natural device orientation, Reference frame remapping

SMS - Sending and Receiving

Working with Media –Playing audio and video, Recording audio and video

UNIT-IV

Location and Maps - Google maps, Using GPS to find current location

Working with data storage - Shared preferences, Preferences activity, Files access, Using External storage, SQLite database

Animation-View animation, Drawable animation

Working with Sensors- Finding sensors, Accelerometers, Gyroscopes, Other types Working with Camera – Controlling the camera, Preview and overlays, Taking pictures

UNIT-V

Content providers- Content provider introduction, Query providers

Network Communication - Web Services, HTTP Client, XML and JSON, Using e-mails.

Services - Service lifecycle, Foreground service, Creating own services

Publishing and Distributing Your App -Preparing for publishing, Google Play requirements,

Signing and preparing the graphics, Publishing to the Android Market, Monetization, Tips on becoming a top app, Google analytics

Reference Books:
2. Learning Android, Ramesh Bangia, Khanna Publishing House

(6.GV.07) Windows Configuration and Server Administration

Understanding Windows Programming Basics: Identify Windows application types, Implement user interface design.
Creating Windows Forms Applications: Create and handle events, Understand Windows Forms inheritance, understand how to create new controls and extend existing controls, Validate and

implement user input, Debug a Windows-based application.

Creating Windows Services Applications: Create a Windows Services application, Installa Windows Services application.

Accessing Data in a Windows Forms Application: Understand data access methods for a Windows Application, Understand data bound controls.

Deploying a Windows Application: Understand windows application deployment methods, integrating data.

Network basics: Type of Networks, Topologies, Transmission media, Install UTP(Straight, Cross, Rollover Cables), IP Addressing, Subneting, OSI Model, TCP/IP Model, Wireless Network, Network Devices.

Installation: Installation Server, Drivers, Working with windows server Devices, Troubleshooting Devices & Drivers, Managing system updates.

Working With Disk Storage: Type of Disk Storage, Type of volumes, Implementing fault tolerance, Use disk management tools, Disk Quota, Troubleshooting disk management, Shadow copy**.**

Domain Controller: Install Active Directory, Manage Active Directory Component, Working with OU Structure, Working with Domain User account, Working with Domain Groups, Troubleshooting Active Directory.

Domain Name Services (DNS): Define Name resolution, Install DNS, Configure DNS Client, Manage and Troubleshoot DNS.

Dynamic Host Configuration Protocol: Configure DNS Server, Working With Super Scope, Configure DHCP Client, Manage and Troubleshoot DHCP Server.

Backup and Restore: Requirement for Backup and Recovery AD, Issue for AD Backup and Recovery, Steps for Backup and Recovery AD.

(6.GV.08) Management Information System

Unit I

An introduction to information systems, Information systems in organizations, Information Technology Concepts, The IS Revolution; Information requirement for the different levels lf management, transaction processing system, Management information 34 system, Decision support system. Strategic Role of Information Systems. Business Processes; Information management, and Decision Making. Computers and Information Processing;

Unit II

Transaction processing system; hardware and software requirements, tools used, case studies, merits and demerits of transaction processing system.

Unit III

Managerial control, Information and tools required, difference between transactional system and managerial system. Frequency of taking outputs, Need for interconnected system, common database, Redundancy control, case studies. Decision support system, concept and tools, case studies, virtual organizations, strategic decisions-unstructured approach, cost and values of unstructured information.

Unit IV

Optimization techniques, difference between optimization tools and DSS tools expert system, difference between expert system and management information system. Role of chief Information officer.

(6.VP.03) Android Application Development Lab

1. Write a simple Application which will print "Hello World!"
2. Write a simple Application that uses UI Layout and Control.

3. Write a simple Application that makes use of Style & Themes.
4. Write a simple Application that uses Event Handling.
5. Write a simple Application that uses Alarm, Notification.
6. Make a location based app.
7. Write a program that shows the use animation.
8. Write a program that shows the use of Image Effects.
9. Write a program that shows the use Image Switcher.
10. Write a program that shows the use of database.

(6.VP.04) MIS Lab

Experiments to be covered based on the theory covered in class

Level 7 (Semester I)

(7.GV.01)Technology Trends in IT

Unit-I
Internet of Things (IoT) – Definition of IoT, History of IoT, IoT vs. similar concepts, Application/Segment overview, Technology overview

Unit-II
Big Data Analytics: Concepts, examples of big data analytics, benefits of big data analytics, Technologies, and Applications, requirements for being successful with big data analytics

Unit-III
Cloud Computing – Introduction, Why cloud services are popular, advantages, Characteristics, Service models, Deployment of cloud services, Potential privacy risks

Unit-IV
Cyber Security – Introduction, risks, Malicious code, Hacker, attacker or intruder, Cyber security Principles, Information Security (IS) within Lifecycle Management, Risks & Vulnerabilities, Incident Response, Future Implications & Evolving Technologies

Unit-V
Wearable Technologies – Introduction, Applications of Wearable Technology, Challenges to Wearable Technology, various Wearable devices.

Reference Books:
5. Computer Today, A. Ravichandran, Khanna Publishing House
6. Internet of Things, Jeeva Jose, Khanna Publishing House
7. Big Data and Hadoop, V.K. Jain, Khanna Publishing House
8. Data Sciences and Analytics, V.K. Jain, Khanna Publishing House

(7.GV.02)Windows Mobile Application Development

Unit-I

INTRODUCTION TO WINDOWS 8 APPLICATION DEVELOPMENT - brief history of windows application development, History of APIs and Tools, Operating System Input Methods
The Windows Charm Bar, Start Button, Search Button, Share Button, Devices Button, Settings Button, Windows Desktop, Switching between Desktop Programs

WINDOWS 8 ARCHITECTURE FROM A DEVELOPER'S POINT OF VIEW - Windows 8 Development Architecture, Desktop Application Layers, Understanding Windows Runtime: Windows Runtime Architecture Overview, Metadata in Windows Runtime, .NET Framework 4.5: The Installation Model of .NET Framework 4.5, Window Runtime Integration, Picking the Appropriate Technology for Your Project, Choosing a Programming Language

GETTING TO KNOW DEVELOPMENT ENVIRONMENT - Introducing the Toolset, Visual Studio IDE: Creating a New Project, Lighting Up Your Applications with Expression Blend

UNIT-II
PRINCIPLES OF MODERN WINDOWS APPLICATION DEVELOPMENT - Windows 8 Style Application, Windows 8 Design Language, Introduction to Asynchronous Programming, Evolution of Asynchronous, Programming on the .NET Platform

CREATING WINDOWS 8 STYLE APPLICATIONS WITH HTML5, CSS, AND JAVASCRIPT - HTML5 and CSS on the Web, HTML5 Technologies, HTML5 Applications on Windows Runtime, The Windows Library for JavaScript (WinJS), Creating Windows 8 Style Applications with JavaScript, Accessing the Filesystem, Managing Data, Respecting the User's Device

UNIT-III
USING XAML TO CREATE WINDOWS 8 STYLE USER INTERFACES - Describing the User Interface Using XAML, Using Namespaces, Understanding the Layout Management System, Reusable Resources in XAML, Basic Controls in Windows 8 Style Applications: Controls with Simply Accessing the Internet: e Values, Content Controls, Working with Data: Data Binding Dependency Properties and Notifications, Binding Modes and Directions

WORKING WITH XAML CONTROLS - Using Animations in Application, Designing the Visual Look of a Control, Working with Complex Controls: Getting to Know the List View Base Controls, Using the Grid View Control, Binding to Data, Grouping Data, Defining Visual Groups

BUILDING WINDOWS 8 STYLE APPLICATIONS - The Lifecycle of a Windows 8 Application, Deploying Windows 8 Apps, Commanding Surfaces, Persisting Application Data, Applications and the Start Screen

UNIT-IV
CREATING MULTI-PAGE APPLICATIONS - Navigation Basics, working with Pages, Using the Split Application and Grid Application Templates

BUILDING CONNECTED APPLICATIONS - Integrating with the Operating System and Other Apps: Picker Unified Design to Access Data, Understanding the Concept of Contracts, Accessing the Internet: Detecting the Changes of Internet Connectivity, Using Feeds, Accessing Windows Live LEVERAGING TABLET FEATURES - Accommodating Tablet Devices, Building Location-Aware Applications, Using Sensors: Using Raw Sensor Data, Using Sensor Fusion Data

UNIT-V
ADVANCED PROGRAMMING CONCEPTS - Building Solutions with Multiple Languages: Hybrid Solutions, Background Tasks: Understanding Background Tasks, How Background Tasks Work, Cancelling Background Tasks, Implementing Background Tasks, creating a Simple Background Task, Managing Task Progress and Cancelation, Input Devices

TESTING AND DEBUGGING WINDOWS 8 APPLICATIONS - The Quality of Software, Becoming Familiar with Debugging, Controlling the Program Flow in Debug Mode, Monitoring and Editing Variables, Changing the Code While Debugging, Windows 8 Style Application-Specific Scenarios, Introduction to Software Testing, Introduction to Unit Testing, Unit Testing Windows 8 Style Applications

INTRODUCING THE WINDOWS STORE - Getting to Know the Windows Store, How Customers See an App in the Windows Store, Application Details, Making Money with Your App, The Developer Registration Process: Submitting the Application, The Application Certification Process, The Windows App Certification Kit.

(7.GV.03) Introduction to Python Programming

- Familiarization with the basics of Python programming: a simple "hello world" program, process of writing a program, running it, and print statements; simple data-types: integer, float, string
- Introduce the notion of a variable, and methods to manipulate it (concept of L-value and R-value even if not taught explicitly)
- Knowledge of data types and operators: accepting input from the console, assignment statement, expressions, operators and their precedence.
- Conditional statements: if, if-else, if-elif-else; simple programs: e.g.: absolute value, sort numbers, and divisibility.
- Notion of iterative computation and control flow: for, while, flowcharts, decision trees and pseudo code; write a lot of programs: interest calculation, primarily testing, and factorials.
- Idea of debugging: errors and exceptions; debugging: pdb, break points.
- Lists, tuples and dictionary: finding the maximum, minimum, mean; linear search on list/tuple of numbers, and counting the frequency of elements in a list using a dictionary. Introduce the notion of accessing elements in a collection using numbers and names.
- Sorting algorithm: bubble and insertion sort; count the number of operations while sorting.
- Strings: compare, concat, substring; notion of states and transitions using state transition diagrams.

Reference Books:
3. Introduction to Computing and Problem Solving With Python, Jeeva Jose, Khanna Publishing House
4. Taming Python by Programming, Jeeva Jose, Khanna Publishing House

(7.GV.04) Introduction to Microprocessors

Digital Design and VHDL
1.8. Introduction
1.9. Combinational Logic
1.10.   Structural Modeling
1.11.   Sequential Logic
1.12.   Finite State Machines
1.13.   Parameterized Modules
1.14.   Testbenches

7. Arithmetic Logic Unit (ALU)
7.1. Introduction
7.2. Arithmetic Circuits
7.3. ALU

7.4. Number Systems

8. Microprocessor I: Instruction Data Set. Machine Language
8.1. Introduction
8.2. Assembly Language
8.3. Machine Language
8.4. Programming
8.5. Addressing Modes
8.6. Lights, Camera, Action: Compiling, Assembling, and Loading
8.7. Odds and Ends

9. Microprocessor II: Control and Datapath Design. Single-Cycle Processor
9.1. Introduction
9.2. Performance Analysis
9.3. Single-Cycle Processor

10. Microprocessor III: Control and Datapath Design. Multi-cycle Processor
10.1.   Introduction
10.2.   Performance Analysis
10.3.   Multicycle Processor
10.4.   Pipelined Processor

11. Memory systems and I/O.
11.1.   Introduction
11.2.   Memory System
11.2.1.   Caches
11.2.2.   Virtual Memory
11.3.   Memory-Mapped I/O
11.3.1.   Memory map
11.3.2.   I/O Devices
11.4.   Buses and organization

Reference Books:
3. Fundamentals of Microprocessor, M.K. Ghodki, Khanna Publishing House
4. Advance Microprocessor, A.K. Gautam, Khanna Publishing House

(7.VP.01)Windows Mobile Application Development Lab

1. Working with J2ME Features
2. Threads & High level UI
3. Developing networked applications using the wireless toolkit
4. Authentication with a webserver
5. Study Windows API's. Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of windows programming.

(7.VP.02) Python Programming Lab

- Find the largest and smallest numbers in a list.

- Find the third largest number in a list.
- Test for primarily.
- Find whether a string is a palindrome or not.
- Given two integers x and n, compute x^n.
- Compute the greatest common divisor and the least common multiple of two integers.
- Test if a number is equal to the sum of the cubes of its digits. Find the smallest and largest such numbers

Level 7 (Semester II)

(7.GV.05) Introduction to AI

UNIT – I

Overview of A.I: Introduction to AI, Importance of AI, AI and its related field, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem Heuristic search techniques : Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

UNIT - II

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, Various approaches used in knowledge representation, Issues in knowledge representation. Using Predicate Logic: Represent ting Simple Facts in logic, Representing instances and is-a relationship, Computable function and predicate.

UNIT - III

Natural language processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, Learning by taking advice, Learning in problem solving, Learning from example-induction, Explanation based learning.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells. Knowledge acquisition: General concepts in knowledge acquisition, early work in Machine Learning, examples of Inductive Learners, computer vision, Robotics, overview of LISP- AI language.

Reference Books:
1. Artificial Intelligence, Munish Chandra Trivedi, Khanna Publishing House

(7.GV.06) e-Commerce

Unit I

Introduction E-Business: Origin and Need of E-Commerce, Factors affecting E -Commerce, Business dimension and technological dimension of E-Commerce, E-Commerce frame work Electronic Commerce Models, Value Chains in Electronic Commerce.

Unit II

Internet and E-Business: Introduction to Internet and its application, Intranet and Extranets. World Wide Web, Internet Architectures, Internet Applications, Business Applications on Internet, E - Shopping, Electronic Data Interchange, Components of Electronic Data Interchange, Creating Web Pages using HTML.

Unit III

Technology for Online Business: Internet, IT Infrastructure, Middleware Contents, Text and Integrating E-Business Applications, Mechanism of Making Payment Through Internet, Online Payment Mechanism, Electronic Payment Systems, Payment Gateways, Visitors to

Website, Tools for Promoting Website, Plastic Money, Debit Card, Credit Card, Laws Relating to Online Transactions.

Unit IV
Applications in E-commerce: E-commerce Applications in Manufacturing, Wholesale, Retail and Service Sector.

Reference Books:
1. E-Commerce, Sarika Gupta, Khanna Publishing House

(7.GV.07) Computer Network Security

UNIT-I
Network Concept, Benefits of Network, Network classification (PAN, LAN, MAN, WAN), Peer to Peer, Client Server architecture, Transmission media: Guided & Unguided, Network Topologies. Networking terms: DNS, URL, client server architecture, TCP/IP, FTP, HTTP, HTTPS, SMTP, Telnet OSI and TCP/IP Models: Layers and their basic functions and Protocols, Comparison of OSI and TCP/IP. Networking Devices: Hubs, Switches, Routers, Bridges, Repeaters, Gateways and Modems, ADSL.

UNIT-II
Ethernet Networking: Half and Full-Duplex Ethernet, Ethernet at the Data Link Layer, Ethernet at the Physical Layer. Switching Technologies: layer-2 switching, address learning in layer-2 switches, network loop problems in layer-2 switched networks, Spanning-Tree Protocol, LAN switch types and working with layer-2 switches, Wireless LAN

UNIT- III
Internet layer Protocol: Internet Protocol, ICMP, ARP, RARP. IP Addressing: Different classes of IP addresses, Sub-netting for an internet work, Classless Addressing. Comparative study of IPv4 & IPv6. Introduction to Router Configuration. Introduction to Virtual LAN.

UNIT- IV
Transport Layer: Functions of transport layer, Difference between working of TCP and UDP. Application Layer: Domain Name System (DNS), Remote logging, Telnet, FTP, HTTP, HTTPS. Introduction to Network Security.

Reference Books:
3. Information & Computer Security, Sarika Gupta, Khanna Publishing House
4. An Integrated Approach to Computer Networks, Bhavneet Sidhu, Khanna Publishing House

(7.GV.08) Introduction to Biometrics

Unit I
Concepts - biometric recognition, biometrics, requirements for biometrics
Biometric systems, their modes and architectures
Biometric system errors and evaluation

Unit II
Overview, comparison and evaluation of various biometrics
Unimodal biometric systems, their advantages, disadvantages and limits
Multimodal biometric systems, their modes of operation, levels of fusion

Unit III
Biometric pattern recognition methods
Privacy protection and social acceptance
Biometric standardization, data formats
Design and implementation of biometric systems, applications of biometric systems, biometric databases, security of biometric systems

(7.VP.03) AI Lab

8. Study of PROLOG.
9. Write a program to solve 8-queen's problem
10. Solve any problem using depth first search.
11. Solve any problem using best first search.
12. Solve 8-puzzle problem using best first search
13. Solve Robot (traversal) problem using means End Analysis
14. Solve traveling salesman problem.

(7.VP.04)Computer Network Security Lab

13. Identification of Connectors and Cables:
    a. Connectors: BNC, RJ-45, I/O box
    b. Cables: Co-axial, twisted pair, Optical fibre.
14. Identification of various networks components
    a. NIC (network interface card)
    b. Hub, Switch, Router.
15. Execution of basic networking Commands: Netstat, IPConfig, IfConfig, Ping, Arp-a, Nbtstat-a, Netdiag, Nslookup, Traceroute, Pathping
16. Design Ethernet Cables: Cross Cable, Straight Cable, Rollover Cable.
17. Demonstration to connect two computers with/without connecting device.
18. Demonstration of File sharing & Printer sharing.
19. Study of various topologies using topology trainer
20. Detailed study of Network and Internet Settings on PC.
21. Trouble shooting of networks & Installation of network device drivers.
22. Study of Router Configuration.
23. Logging into a router, Editing and Help features and Saving Router configuration.
24. Setting the Hostname, Descriptions, IP Address, and Clock Rate on a Router.