

## 6.1 APPLICATION DEVELOPMENT USING WEB FRAMEWORK

<b>L</b>	<b>P</b>
-	6

### RATIONALE

This course will cover the practical aspects of Web App development using various frameworks. The course equips the students with resources for design, development and production of web applications. Students will be introduced to popular web application frameworks for building scalable web applications. The main objective for this course is to motivate student's interest in learning Web-app development by giving them an insight into its possibilities through practical applications. In addition, the course also provides a sufficiently broad but practical introduction to Server-side web technologies

### COURSE OUTCOMES

After undergoing the training, the students will be able to:

- CO1: Identify basic aspects of web-frameworks.
- CO2: Install, create and manage Blogs, Websites using WordPress.
- CO3: Use PHP & MySql with WordPress.
- CO4: Install and create Web Application using Moodle.
- CO5: Manage features of Moodle sites and take backup of site content.

### PRACTICAL EXERCISES:

1. Install WordPress & Create Blogs
2. Manage blogs features e.g. Images, Text Around Images, Comments, Post Formats, Linking, Pages, Categories, Smilies, Feeds, Gravatars, Password Protection
3. Practice various designing features: Colour Scheme, Headers, CSS Horizontal Menus, Dynamic Menu, Highlighting, Navigation Links, Print
4. Read More, Formatting Date and Time, Finding CSS Styles, Creating Individual Pages, Uploading Files, Using WordPress Themes, Templates, Template Tags, Template Hierarchy, Validating a Website, Know Your Sources, WordPress Site Maintenance
5. Integrate PHP & MySql with WordPress

6. Install Moodle & various plugins.
7. Create a Moodle site and Database Schema
8. Design Site appearance, Front page, Front page settings, My Moodle, User profiles, Navigation, Course list, Themes, Theme settings, Header and footer, Language settings, Using web services, Publishing a course, Blogs, RSS feeds
9. Manage Moodle site, Managing authentication, Manual accounts, No login, Email-based self-registration, Account
10. Create Roles and permissions, Assign roles,
11. Implement Password salting.
12. Perform Site backup, Course backup, Course restore, Automated course backup.

## RECOMMENDED BOOKS

1. <http://www.wpbeginner.com/beginners-guide/how-to-learn-wordpress-for-free-in-a-week-or-less/>
2. [https://docs.moodle.org/22/en/Table\\_of\\_Contents](https://docs.moodle.org/22/en/Table_of_Contents)
3. e-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

## RECOMMENDED WEBSITE

1. <http://swayam.gov.in>

## INSTRUCTIONAL STRATEGY

Since the entire course content is web based, students can practice it online. The teachers should have practice on this framework. Entire course is hands-on based so practicals should be conducted in the laboratory.

## 6.2 ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT

<b>L</b>	<b>P</b>
<b>3</b>	<b>-</b>

### RATIONALE

In the present day scenario, it has become imperative to impart entrepreneurship and management concepts to students so that a significant percentage of them can be directed towards setting up and managing their own small enterprises. This subject focuses on imparting the necessary competencies and skills of enterprise set up and its management.

### COURSE OUTCOMES

After undergoing the subject, the students will be able to:

- CO1: Comprehend the importance of entrepreneurship and its role in nation's development.
- CO1: Classify the various types of business and business organizations.
- CO3: Identify the various resources / sources and / or schemes for starting a new venture.
- CO4: Explain the principles of management including its functions in an organisation.
- CO4: Conduct market survey and prepare project report.

### DETAILED CONTENTS

#### UNIT I

Entrepreneurship: Concept and definitions, classification and types of entrepreneurs, entrepreneurial competencies, Traits / Qualities of entrepreneurs, manager v/s entrepreneur, role of Entrepreneur, barriers in entrepreneurship, Sole proprietorship and partnership forms of business organizations, small business vs startup, critical components for establishing a start-up, Leadership: Definition and Need, Manager Vs leader, Types of leadership

#### UNIT II

Definition of MSME (micro, small and medium enterprises), significant provisions of MSME Act, importance of feasibility studies, technical, marketing and finance related problems faced by new enterprises, major labor issues in MSMEs and its related laws, Obtaining financial assistance through various government schemes like Prime Minister Employment Generation Program (PMEGP) Pradhan Mantri Mudra Yagna (PMMY) , Make in India, Start-up India, Stand up India , National Urban

Livelihood Mission (NULM); Schemes of assistance by entrepreneurial support agencies at National, State, District level: NSIC, NRDC, DC:MSME, SIDBI, NABARD, Commercial Banks, SFC's TCO, KVIB, DIC, Technology Business Incubator (TBI) and Science and Technology Entrepreneur Parks (STEP).

### **UNIT III**

**NATURE AND FUNCTIONS OF MANAGEMENT:** Definition, Nature of Management, Management as a Process, Management as Science and Art, Management Functions, Management and Administration, Managerial Skills, Levels of Management; Leadership.

**PLANNING AND DECISION MAKING:** Planning and Forecasting - Meaning and definition, Features, Steps in Planning Process, Approaches, Principles, Importance, Advantages and Disadvantages of Planning, Types of Plans, Types of Planning, Management by Objective. Decision Making-Meaning, Characteristics.

### **UNIT IV**

**ORGANISING AND ORGANISATION STRUCTURE:** Organizing Process - Meaning and Definition, Characteristics Process, Need and Importance, Principles, Span of Management, Organisational Chart - Types, Contents, Uses, Limitations, Factors Affecting Organisational Chart.

**STAFFING:** Meaning, Nature, Importance, Staffing process. Manpower Planning, Recruitment, Selection, Orientation and Placement, Training, Remuneration.

**CONTROLLING AND CO-ORDINATION** Controlling - Meaning, Features, Importance, Control Process, Characteristics of an effective control system, Types of Control. Co-ordination - characteristics, essentials.

### **UNIT V**

Market Survey and Opportunity Identification, Scanning of business environment, Assessment of demand and supply in potential areas of growth, Project report Preparation, Detailed project report including technical, economic and market feasibility, Common errors in project report preparations, Exercises on preparation of project report.

### **RECOMMENDED BOOKS**

- 1 BS Rathore and Dr. JS Saini, "A Handbook of Entrepreneurship", Aapga Publications, Panchkula (Haryana).
- 2 Entrepreneurship Development, Tata McGraw Hill Publishing Company Ltd., New Delhi.

- 3 CB Gupta and P Srinivasan, “Entrepreneurship Development in India”, Sultan Chand and Sons, New Delhi.
- 4 Poornima M Charantimath, “Entrepreneurship Development - Small Business Enterprises”, Pearson Education, New Delhi.
- 5 David H Holt, “Entrepreneurship: New Venture Creation”, Prentice Hall of India Pvt. Ltd., New Delhi.
- 6 PM Bhandari, “Handbook of Small Scale Industry”.
- 7 L M Prasad, “Principles and Practice of Management”, Sultan Chand & Sons, New Delhi.

### **SUGGESTED WEBSITES**

1. <https://ipindia.gov.in/>

### **INSTRUCTIONAL STRATEGY**

Some of the topics may be taught using question/answer, assignment or seminar method. The teacher will discuss stories and case studies with students, which in turn will develop appropriate managerial and entrepreneurial qualities in the students. In addition, expert lecturers may also be arranged from outside experts and students may be taken to nearby industrial organizations on visit. Approach extracted reading and handouts may be provided. In addition, different activities like conduct of entrepreneurship awareness camp extension lecturers by outside experts, interactions sessions with entrepreneurs and industrial visits may also be organized. This subject contains five units of equal weightage.

## 6.3 SOFTWARE ENGINEERING

<b>L</b>	<b>P</b>
<b>3</b>	<b>-</b>

### RATIONALE

The system analysis and design is the backbone of Application software development. After studying the subject the students will be able to develop and design the system according to given requirements. It involves various steps in analysis and design of the system. It includes the knowledge of preparing project systematically.

### COURSE OUTCOMES

After undergoing the subject, the students will be able to:

CO1: Learn about different types of systems.

CO2: Study various life cycle models.

CO3: Describe software requirement specifications.

CO4: Explain characteristics and features of good Software.

CO5: Define the concept of software testing and verification.

### DETAILED CONTENTS

#### UNIT I

#### INTRODUCTION TO SOFTWARE ENGINEERING

**Concept of systems:** Types of systems: open, closed, static and dynamic systems.

Introduction, Programmes v/s Software Products

Emergence of Software Engineering- Early Computer Programming, High-level Language Programming, Control flow based Design, Data Structure Oriented Design, Object Oriented Design.

#### UNIT II

#### SOFTWARE LIFE CYCLE MODELS

Iterative Model, Requirement of Life Cycle Model, Classic Waterfall Model, Prototyping Model,

Evolutionary Model, Spiral Model, Introduction to Agile Model.

Comparison of different Life Cycle Models.

### **UNIT III**

#### **SOFTWARE PLANNING**

Responsibilities of Software Project Manager

- Metrics for Project Size Estimation- LOC (Lines of Code), Function Point Metric

- Project estimation Techniques- Using COCOMO Model.

Software Requirement Specifications (SRS), Characteristics of good SRS

### **UNIT IV**

#### **SOFTWARE DESIGN AND IMPLEMENTATION**

Characteristics and features of good Software Design Cohesion and Coupling, Software design Approaches- Function Oriented Design (Data flow diagrams, Data dictionary, Decision Trees and tables), Object Oriented Design, Structured Coding Techniques, Coding Styles, documentation.

### **UNIT V**

#### **SOFTWARE TESTING**

Concept of Testing, Verification v/s Validations, Unit Testing, Black Box Testing, White Box Testing, Integration testing, System testing, Introduction to Configuration Management.

#### **RECOMMENDED BOOKS**

1. Software Engineering by Rajib Mall, PHI Publishers, New Delhi.
2. An Integrated Approach to Software Engineering by Pankaj Jalote, Narosa Publishing. House Pvt Ltd, Darya Ganj, New Delhi 110002.
3. Software Engineering, Sangeeta Sabharwal, New Age International, Delhi.
4. Software Engineering by KK Aggarwal and Yogesh Singh.
5. Software Engineering – A Practitioner’s Approach by RS Pressman, Tata McGraw Hill Publishers, New Delhi.
- 6 e-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

**RECOMMENDED WEBSITES**

1. <https://swayam.gov.in/>

**INSTRUCTIONAL STRATEGY**

This is theoretical subject and contains five units of equal weightage.



## 6.4 PROGRAMME ELECTIVE - II

### 6.4.1 NETWORK SECURITY

<b>L</b>	<b>P</b>
<b>2</b>	<b>2</b>

#### RATIONALE

This course has been designed keeping in view basic computer users and information system managers. The students are acquainted with the concepts needed to secure a network, understanding risks and how to deal with them. It is hoped that the students will have a wider perspective on security in general and better understanding of how to reduce and manage the security risks.

#### COURSE OUTCOMES

After undergoing the subject, the students will be able to:

- CO1: Learn the need of network security.
- CO2: Study various encryption and decryption techniques.
- CO3: Differentiate and deploy virus protection.
- CO4: Describe Firewalls and intrusion detection systems.
- CO5: Setup and configure virtual private network.

#### DETAILED CONTENTS

##### UNIT I

###### INTRODUCTION

Need for securing a network; Principles of Security, Type of attacks, introduction to cyber-crime, cyber law-Indian Perspective (IT Act 2000 and amended 2008), cyber ethics, ethical hacking. Hacking, Skimming, attacker, phreaker, hackivist, bluejacking, bluesnarfing, IOS Jailbreaking.

##### UNIT II

###### SECURING DATA OVER INTERNET

Introduction to basic encryption and decryption, concept of symmetric and asymmetric key cryptography, overview of DES, RSA and PGP. Introduction to Hashing: MD5, SSL, SSH, HTTPS, Digital Signatures, Digital certification, IPsec.

**UNIT III****VIRUS, WORMS AND TROJANS**

Definitions, preventive measures – access control, checksum verification, process configuration, virus scanners, heuristic scanners, application level virus scanners, deploying virus protection, Zombie, Ransomware.

**UNIT IV****FIREWALLS**

Definition and types of firewalls, firewall configuration, Limitations of firewall. Whitelisting Vs blacklisting.

**INTRUSION DETECTION SYSTEM (IDS)/IPS**

Introduction; IDS limitations – teardrop attacks, counter measures; Host based IDS set up

**UNIT V**

**HANDLING CYBER ASSETS-** Configuration policy as per standards, Disposable policy.

**VIRTUAL PRIVATE NETWORK (VPN)**

Basics, setting of VPN, VPN diagram, configuration of required objects, exchanging keys, modifying security policy

**DISASTER AND RECOVERY**

Disaster categories; network disasters – cabling, topology, single point of failure, save configuration files; server disasters – UPS, RAID, Clustering, Backups, server recovery

**PRACTICAL EXERCISES**

1. Installation and comparison of various antivirus software.
2. Installation and study of various parameters of firewall.
3. Writing program in C to Encrypt/Decrypt using XOR key.
4. Study of VPN.
5. Study of various hacking tools.
6. Practical applications of digital signature.

**RECOMMENDED BOOKS**

1. Cryptography and Network Security by Forouzon; Tata McGraw Hill Education Pvt Ltd, New Delhi.
2. Cryptography and Network Security by Atul Kahate; Tata McGraw Hill Education Pvt Ltd, New Delhi.

3. Cryptography and Network Security by Padmanabham; Wiley India Pvt Ltd. Daryaganj, New Delhi.
4. Network Security by Eric Cole, Bible; Wiley India Pvt Ltd. Daryaganj, New Delhi.
5. Network Security by William Stalling.
6. e-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

### **RECOMMENDED WEBSITES**

1. <https://swayam.gov.in/>

### **INSTRUCTIONAL STRATEGY**

This is hands on practice based subject and topics taught in the class should be practiced in the Lab regularly for development of required skills among the students. This subject contains five units of equal weightage.

## 6.4.2. MOBILE APPLICATION DEVELOPMENT

<b>L</b>	<b>P</b>
<b>2</b>	<b>2</b>

### RATIONALE

Mobile Application development is the very hot business domain. Majority of the corporate have a separate division for the development of mobile applications. It is essential that diploma students must know the way to apply advanced data communicating methods and networking protocols for wireless and mobile devices.

### COURSE OUTCOMES

After undergoing the subject, the students will be able to:

- CO1: Study the characteristics, basic concepts of mobile computing.
- CO2: Illustrate architecture and protocols in Mobile computing.
- CO3: Compare the network protocols governing the mobile communication.
- CO4: Describe different kinds of mobile OS prevailing in the market.
- CO5: Develop a mobile application using different components of Android.

### DETAILED CONTENTS

#### UNIT-I

Architecture of Mobile Computing, 3- Tier Architecture, Presentation (Tier-1), Application (Tier -2), Data ( Tier – 3)

#### UNIT-II

Introduction to SMS, Mobile OS.

Short Message Service (SMS): Mobile computing over SMS, Short Message Service, Strength of SMS, SMS Architecture, Value added services through SMS.

Mobile Operating Systems: Evaluation of Mobile Operating System-Handset. Manufactures and their Mobile OS- Mobile OS and their features.

#### UNIT-III

ANDROID : Android Versions, Features of Android, Architecture of Android, Android Market, Android Runtime (Dalvik Virtual Machine)

ANDROID SDK & ADT: Android SDK, Android Development Tool (ADT), Installing and configuring Android, Android Virtual Device (AVD).

ACTIVITIES & INTENTS: Understanding Activities, Activity Life Cycle, Linking activities. and intents, Calling built-in applications using intents, Fragments Displaying Notifications  
User Interface: Views and View groups, Layouts, Display Orientation, Action Bar, Listening for UI Notifications.

## UNIT-IV

Basic Views: Text view, Button, Image Button, Edit Text, Check Box, Toggle Button, Radio Button and Radio Group Views, Progress Bar View, Auto Complete Text View.

Advanced Views: Time Picker View and Date Picker View, List Views, Image View, Menus, Analog and Digital View, Dialog Boxes.

Displaying Pictures & Menus with Views: Image View, Gallery View, Image Switcher, Grid View - Creating the Helper Methods, Options Menu, Context Menu.

## UNIT-V

Location Based Services: Obtaining the Maps API Key, Displaying the Map, Zoom Control, Navigating to a specific location, Adding Marker, Geo Coding and reverse Geo coding

Storage: Store and Retrieve data's in Internal and External Storage, SQLite, Creating and using databases

## PRACTICAL EXERCISES

1. Installation of Android Virtual Studio.
2. Write a program to demonstrate activity (Activity Life Cycle).
3. Write a program to demonstrate different types of layouts.
4. Write a program to implement simple calculator using text view, edit view, option.
5. Write a program to demonstrate photo gallery.
6. Write a program to demonstrate Date picker and time picker.
7. Write a program to send e-mail.
8. Write a program to demonstrate web view to display website.

9. Write a program to display map of given location/position using map view.
10. Write a program to store and fetch data from SQL life database.

### **RECOMMENDED BOOKS**

1. Beginning Android 4 Application Development by Wei-Meng Lee; Wiley India.
2. Android Apps for Absolute Beginners by Jackson; Apress.
3. Mobile Computing by Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal; Tata McGraw Hill.
4. Mobile communications Jochen Schiller; Pearson Education.
6. E-books/e-tools/relevant software to be used as recommended by AICTE/HSBTE/NITTTR.

### **RECOMMENDED WEBSITES**

1. <http://swayam.gov.in>

### **INSTRUCTIONAL STRATEGY**

This is hands on practice based subject and topics taught in the class should be practiced in the Lab regularly for development of required skills among the students. This subject contains five units of equal weightage.

## 6.5 MAJOR PROJECT/INDUSTRIAL TRAINING

<b>L</b>	<b>P</b>
<b>-</b>	<b>16</b>

### RATIONALE

Major project/Industrial training work will help in developing the relevant skills among the students as per National Skill Qualification Framework. It aims at exposing the students to the present and future needs of various relevant industries. It is expected from the students to get acquainted with desired attributes for industrial environment. For this purpose, students are required to be involved in industrial training / Major Project Work in different establishments.

### COURSE OUTCOMES

After undergoing this course, the students will be able to:

- CO1: Define the problem statement of the Industrial training/Major project according to the need of industry.
- CO2: Work as a team member for successful completion of Industrial training / Major project.
- CO3: Write the Internship/Major project report effectively.
- CO4: Present the Internship/Major project report using PPT.

### GUIDELINES

Depending upon the interest of the students, they can go for Industrial training / Major project as per present and future demand of the industry. The supervisors may guide the students to identify their project work and chalk out their plan of action well in advance. As an Industrial training / Major project activity each student is supposed to study the operations at site and prepare a detailed project report of the observations/processes/activities. The supervisor may create a group of 4-5 students as per their interest to work as a team for successful completion of the Industrial training / Major Project.

The supervisor shall evaluate the students along with one external industry / academic expert by considering the following parameters:

	<b>Parameter</b>	<b>Weightage</b>
I	Defining problem statement, focus and approach	20%
ii	Innovation / creativity	20%
iii	Report Writing	20%
iv	Power Point Presentation	20%
v	Viva - voce	20%