Appendix-7
Resolution No. 5-2

# INDEX

# KALINDI COLLEGE

# SEMESTER – V

## Bachelor of Vocation- Web Designing


# INDEX

# KALINDI COLLEGE

# SEMESTER – VI

## Bachelor of Vocation- Web Designing

## DISCIPLINE SPECIFIC CORE COURSE – 13 Full Stack Web Development 2

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Full Stack Web Development 2 | 4 | 3 | 0 | 1 | Class XII Pass | DSC-10 |

### Learning Objectives

1. Assimilate and master latest framework like frameworks like JS, Node.JS, and Mongo DB.

### Learning Outcomes

1. Able to use basic to advanced Node JS.
2. Integrate Node JS with mongo database.
3. Install and use different tools like Github, Maven and Jenkins.
4. Develop a fully functioning website and deploy on a web server.

### SYLLABUS OF DSC-13

**Unit I Introduction to Node JS (6 Hours)**

What is Node.js, Why Node.js, Node in-built packages (buffer, fs, http, os, path, util, url), Node.js Modules, Import your own Package, Node Package Manager (NPM), Local and Global Packages, File System: Get Input from Users, Pass Multiple Arguments with Yargs, File System Module.

**Unit 2 Advanced Node JS (12 Hours)**

Express Framework, Run a Web Server using Express Framework, Routes, Deploy application using PM2 and Nginx, Asynchronous Programming- Call Stack, Callbacks, Callback Queue and Event Loop, Callback Abstraction, Callback Chaining.

**Unit 3 Integration of Node.js with Mongo DB (9 Hours)**

Inserting Documents, Querying, Updating and Deleting Documents, Connect Mongo DB and Node.js Application, REST API.

**Unit 4 Overview of Git, Jenkins and Maven: Git (9 Hours)**

Understand the differences between Git, Github and Gitlab, Install and configure Git for use, Use Git to manage files using CLI commands, Create, Clone and manage repositories.

**Jenkins**- Jenkins and its architecture, Jenkins tools management, user management in Jenkins

**Maven** - Maven project structure, maven plugins, Project object model (POM), maven build lifecycle, adding external dependencies to maven pom.xml, maven build and test project.

**Unit 5 Introduction to Docker (9 Hours)**

Comparing VM and Docker, Docker- an Architectural overview, The Docker Hub A brief Introduction, Preparing docker - machine- Installation and configuration, Start containerizing, Play with docker images, Customizing container on your own, Running Container with Docker - commands, Port forwarding with docker container.

**Essential Readings**

1. Brad Dayley, Node.js, Mongo DB and Angular Web Development: The definitive guide to using the MEAN stack to build web applications (Developer's Library), 2nd edition, Addison-Wesley, 2018.
2. John Edward, Cooper Berg, DevOps. Building CI/CD Pipelines with Jenkins, Docker Container, AWS ECS, JDK 11, Git and Maven 3, Kindle Edition.

**Practical component**

A web development project implementing the technologies such as Node JS, Mongo DB, Angular JS, jQuery, JavaScript, Git, Jenkins and Maven.

Consider the following case study.

Smart Evaluation Portal is an application used for conducting online exams for the students. Exam consists of objective type questions with only 4 options, among them 1 option will be correct. Two types of Users are maintained in the application :

(i) Admin User : Admin user is responsible for creating the Exam, adding the questions and generating the results.

(ii) Student User : Student user will attempt the test that was created by the admin user in a particular time limit.

Following are the requirement map for the application as Admin Perspective:

(a) Admin can register and login with his/her email id and password.
(b) Admin can Create a New Test by giving information like Name of Test, Duration of Test, Total Marks of Test, Number of Questions in Test, Date and Time of the Test.
(c) Admin can Edit/View/Insert and delete the Questions prepared for the test.
(d) Admin can Plan multiple tests at same time by maintaining 4 status of the Tests as : Draft Tests, Scheduled Test, Result Awaited Tests, Live Tests. At a particular time, the test will be at one of the following stages.
(e) Admin Can Block, Unblock user at the time of test.

Following are the requirement map for the application as Student Perspective:

(a) Students can Register herself/himself at the time of taking the test.
(b) Students can Mark answers according to the question by choosing any one option from the given options.
(c) Students can submit the test in between as well.

Perform Following Practicals based on above requirements.

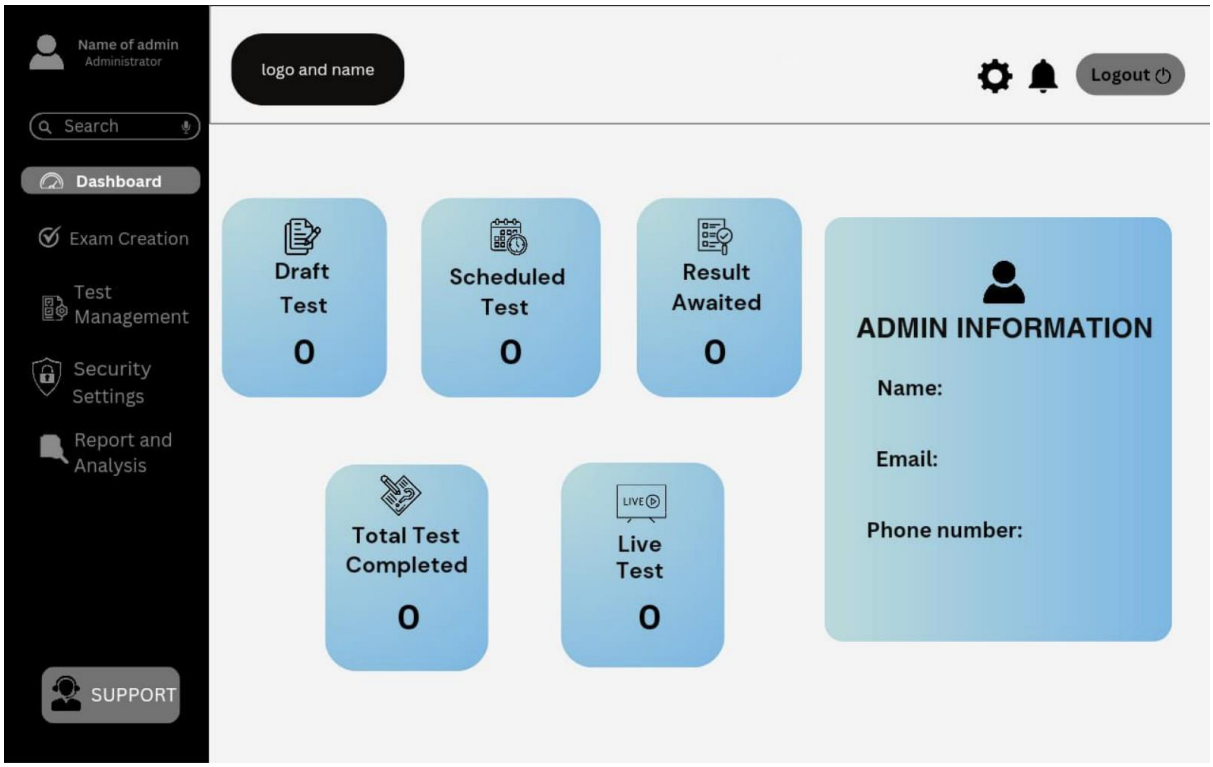
**1.** Configure and Install Git and Create a Git repository of the Smart Evaluation Portal application by using the following commands -

Git init
Git add <file names>
Git Commit -m “Smart Evaluation Portal”

**2.** Create a Github repository on Github Cloud and Push the git repository (Created in Practical 1) into that Github repository by using CLI Commands.

**3.** Create HTML Forms using HTML, CSS, AngularJS for the Admin Registration which includes following fields : Name, email_id, Phone number, password etc. Data must be captured using Node.js framework and data will get stored in MongoDB Database.

**4.** Create Admin Dashboard by using HTML, CSS, Node JS and MongoDB. Use Asynchronous Programming wherever needed in the application. Event loops and Callback Chaining must be implemented during creation of dashboards.




**5.** Create MongoDB Containers and Insert/Delete and Update documents in the following containers developed for Smart Evaluation Portal :

a) Admin Information
b) Exam Information
c) Test Management

**6.** Create a Maven Spring Boot Project with POM.xml file which will used for Inserting, updating and deleting user responses in the particular tests. Maven project will directly connect to Mongodb database using JDBC or hibernate. Add all required dependencies in POM.xml to run that project.

**7,** i. Install Docker into your system.
ii. Create Docker File of Smart Evaluation Portal Project
iii. Develop the docker Image for the application which consist of all the required dependencies.
iv. Upload that Docker image on Docker Hub Cloud platform.

**8**. Use Docker Hub image uploaded in Practical 7 and execute it in your local Machine by using CLI Docker commands and execute it to make it a docker Container.

**9.** Use Jenkins CI/CD Pipeline for updating and changing the new requirements in the Smart Evaluation Portal for Software maintenance and Management.

**10.** Use Git Commands to Commit, Push and Pull Changes from the github repository to your local machine Project. Following Commands must be used :

i) git Push Origin
ii) git Commit -m
iii) git pull

## DISCIPLINE SPECIFIC CORE COURSE – 14 Software Engineering

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Software Engineering | 4 | 3 | 0 | 1 | Class XII Pass | NA |

### Learning Objectives

This course will provide fundamental approaches and techniques used to develop good-quality software. This includes learning of various software development process frameworks, requirement analysis, design modeling, qualitative and quantitative software metrics, risk management, and testing techniques.

### Learning Outcomes

On successful completion of the course, students will be able to:

1. Understand the software development models.
2. Analyze and model customer requirements and build design models.
3. Estimate and prepare schedule for software projects.
4. Analyze the impact of risks involved in software development.
5. Design and build test cases, and to perform software testing.

### SYLLABUS OF DSC-14

**Unit 1 Introduction (9 Hours)**

Software Engineering - A Layered Approach; Software Process – Process Framework, Umbrella Activities; Process Models – Waterfall Model, Incremental Model, and Evolutionary process Model (Prototyping, Spiral Model); Introduction to Agile, Agile Model – Scrum.

**Unit 2 Software Requirements Analysis and Specification (6 Hours)**

Use Case Approach, Software Requirement Specification Document, Flow-oriented Model, Data Flow Model.

**Unit 3 Design Modeling (9 Hours)**

Translating the Requirements model into the Design Model, The Design Process, Design Concepts - Abstraction, Modularity and Functional Independence; Structure Charts.

**Unit 4 Software Metrics and Project Estimation (9 Hours)**

Function based Metrics, Software Measurement, Metrics for Software Quality; Software Project Estimation (FP based estimations); Project Scheduling (Timeline charts, tracking the schedule).

**Unit 5 Quality Control and Risk Management (3 Hours)**

Quality Control and Quality Assurance, Software Process Assessment and Improvement; Software Risks, Risk Identification, Risk Projection, Risk Mitigation, Monitoring and Management.

**Unit 6 Software Testing (9 Hours)**

Strategic Approach to Software Testing, Unit Testing, Integration Testing, Validation Testing, System Testing; Black-Box and White Box Testing, Basis Path Testing.

**Essential Readings**

1. R. S. Pressman, Software Engineering: A Practitioner's Approach, 9th Edition, McGraw-Hill, 2020.

2. K. K. Aggarwal, Yogesh Singh, Software Engineering, 3rd Edition, New Age International Publishers, 2007.

**Suggested Readings**

1. P. Jalote, An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House, 2005.

2. Ian Sommerville, Software Engineering, 9th Edition, Addison Wesley, 2011.

3. Ken Schwaber, Jeff Sutherland, The Definitive Guide to Scrum: The Rules of the Game, 2016.

**Practical component**

Create a project report that includes the following–

1. Define Problem Statement and identify process model.
2. Requirement Analysis: Create Use Case diagram and SRS Document.
3. Software Matrices and Project Estimation: Compute Function Point, estimate Effort and Cost, identify Risks, and create a Timeline Chart.
4. Software Design: Create Structured Chart.

5. Coding: Implement at least one module in a programming language of your choice.
6. Testing: Compute Cyclomatic Complexity and generate some test cases for validation.

**Some of the Sample Projects are given below thought they are not limited to this.**

1. College Canteen Automation System
2. Online Car-Pooling System
3. Patient Appointment System
4. Online Attendance Management System
5. Medical Prescription Processing System

## DISCIPLINE SPECIFIC CORE COURSE – 15 WordPress and Framework

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| WordPress and Framework | 4 | 3 | 0 | 1 | Class XII Pass | DSC-11, DSC-12 |

### Learning Objectives

The objective of this course is to motivate student's interest in web application framework for building scalable web application development.

### Learning Outcomes

On successful completion of the course, students will be able to:

1. Identify basic aspects of web-frameworks.
2. Apply the basic concepts, principles and practices of Web-site development using server-side technologies (PHP & MySQL).
3. Create and manage Blogs,Websites using WordPress.
4. Usage of PHP & MySQL with WordPress.

### SYLLABUS OF DSC-15

**Unit 1: Web Technologies (9 Hours)**

HTML, CSS, Java Script, Ajax. Server side scripting language – PHP, Relational Database Management System - MySQL

**Unit 2: Introduction to Web Frameworks (3 Hours)**

Introduction to WordPress Web Frameworks, Working of WordPress.

**Unit 3: Introduction to WordPress (9 Hours)**

Introduction to Blogging, Creating Blogs, Using Images, Wrapping Text Around

Images, Comments, Post Formats, Linking to Posts, Pages, and Categories, Using Smilies, Links Manager, WordPress Feeds, Customizing Feeds, Use Gravatars in WordPress, Writing Code in Your Posts, Using Password Protection.

**Unit 4: Design features of WordPress (21 Hours)**

Developing a Colour Scheme, Designing Headers, CSS Horizontal Menus, Dynamic Menu Highlighting, Navigation Links, Next and Previous Links, Styling for Print, Designing Your Post Meta Data Section, Separating Categories in your Post Meta Data Section, Customizing the 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 the Sources, WordPress Site Maintenance.

**Unit 5: WordPress with MySQL (3 Hours)**

Working of MySQL in WordPress.

**Essential Readings**

1. Brian Messenlehner, Jason Coleman, Building Web Apps with WordPress: WordPress as an Application Framework, 2nd Edition, O'Reilly, 2019.
2. Jeff Siarto, Head First WordPress: A Brain-Friendly Guide to Creating Your Own Custom WordPress Blog, O'Reilly, 2010.
3. http://www.wpbeginner.com/beginners-guide/how-to-learn-wordpress-for-free-in-aweek-or-less/

**Practical component**

Create a blog website using WordPress, focusing on the following aspects:

1. **Setup and Configuration:**
    i. Install WordPress on a hosting platform or local server.
    ii. Configure a MySQL database and integrate it with WordPress.
2. **Theme Customization and Design:**
    i. Select a WordPress theme or develop a custom theme.
    ii. Customize the theme extensively by:
        - Creating a unique color scheme that complements your brand.

- Designing headers with graphical elements or sliders.
- Implementing CSS for horizontal menus with dynamic highlighting.
- Styling for print and ensuring readability across different devices.
- Designing post meta data sections and formatting date/time displays.

3. **Content Creation and Management:**
   i. Create and publish a variety of blog posts (minimum 4) showcasing different:
      - Post formats (e.g., standard, image, video, gallery).
      - Use of images with text wrapping and alignment.
      - Integration of Gravatars and customizing comment sections.
      - Password-protecting selected posts for restricted access.
4. **Enhanced Functionality with Plugins:**
   i. Install and configure essential WordPress plugins to enhance functionality, such as:
      - SEO optimization plugin for better search engine visibility.
      - Social media sharing and integration plugins.
      - Advanced custom fields for additional content flexibility.
      - Contact form plugin with Ajax submission for seamless user interaction.
5. **WordPress Features Implementation:**
   i. Utilize WordPress core features effectively:
      - Linking posts, pages, and categories for seamless navigation.
      - Managing comments and integrating social media links.
      - Customizing RSS feeds and ensuring compatibility with feed readers.

## DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE 3A Data Mining

| Course title &Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre- requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Data Mining | 4 | 3 | 0 | 1 | Class XII Pass | NA |

### Learning Objectives

This course introduces data mining techniques and enables students to apply these techniques on real-life datasets. The course focuses on three main data mining techniques: Classification, Clustering and Association Rule Mining tasks.

### Learning Outcomes

On successful completion of the course, students will be able to:

1. Pre-process the data, and perform cleaning and transformation
2. Apply suitable classification algorithm to train the classifier and evaluate its performance.
3. Apply appropriate clustering algorithm to cluster data and evaluate clustering quality.
4. Use association rule mining algorithms and generate frequent item-sets and association rules.

### SYLLABUS OF DSE-3A

**Unit I Introduction to Data Mining (9 Hours)**

Applications of data mining, data mining tasks, motivation and challenges, types of data attributes and measurements, data quality.

**Data Pre-processing** - aggregation, sampling, dimensionality reduction, Feature Subset Selection, Feature Creation, Discretization and Binarization, VariableTransformation.

**Unit 2 Classification and Model Evaluation (12 Hours)**

Basic Concepts, Decision Tree Classifier: Decision tree algorithm, attribute selection measures, Nearest Neighbour Classifier, Bayes Theorem and Naive Bayes Classifier, Holdout Method, Random Sub Sampling, Cross-Validation, evaluation metrics, confusion matrix.

**Unit 3 Association rule mining (12 Hours)**

Transaction data-set, Frequent Itemset, Support measure, Apriori Principle, Apriori Algorithm, Computational Complexity, Rule Generation, Confidence of association rule.

**Unit 4 Cluster Analysis (12 Hours)**

Basic Concepts, Different Types of Clustering Methods, Different Types of Clusters, K-means: The Basic K-means Algorithm, Strengths and Weaknesses of K-means algorithm, Agglomerative Hierarchical Clustering: Basic Algorithm, Proximity between clusters.

**Essential Readings**

1. Pang-Ning Tan, Michael Steinbach, Anuj Karpatne, Vipin Kumar,Introduction to Data Mining, 2nd Edition, Pearson, 2021.
2. Jiawei Han, Micheline Kamber, Pei Jian, Data Mining: Concepts andTechniques. 3rd edition. Morgan Kaufmann, 2011.

**Practical component**

Q1.Create a file “people.txt” with the following data:

| Age | agegroup | height | status | yearsmarried |
|---|---|---|---|---|
| 21 | adult | 6.0 | single | -1 |
| 2 | child | 3 | married | 0 |
| 18 | adult | 5.7 | married | 20 |

| | | | | |
|---|---|---|---|---|
| 221 | elderly | 5 | widowed | 2 |
| 34 | child | -7 | married | 3 |

i) Read the data from the file "people.txt".
ii) Create a ruleset E that contains rules to check for the following conditions:

1. The age should be in the range 0-150.
2. The age should be greater than years married.
3. The status should be married, single, or widowed.
4. If age is less than 18, the age group should be child; if age is between 18 and 65, the age group should be adult; if age is more than 65, the age group should be elderly.

iii) Check whether ruleset E is violated by the data in the file people.txt.
iv) Summarize the results obtained in part (iii).
v) Visualize the results obtained in part (iii).

Q2. Perform the following preprocessing tasks on the dirty_iris dataset:

i) Calculate the number and percentage of observations that are complete.

ii) Replace all the special values in data with NA.

iii) Define these rules in a separate text file and read them:

- Species should be one of the following values: setosa, versicolor, or virginica.
- All measured numerical properties of an iris should be positive.
- The petal length of an iris is at least 2 times its petal width.
- The sepal length of an iris cannot exceed 30 cm.
- The sepals of an iris are longer than its petals.

Use the appropriate functions (e.g., editfile function in R with package editrules or similar function in Python) and print the resulting constraint object.

iv) Determine how often each rule is broken (violated edits). Also, summarize and plot the result.

v) Find outliers in sepal length using boxplot and boxplot.stats.

Q3. Load the data from the wine dataset. Check whether all attributes are standardized (mean is 0 and standard deviation is 1). If not, standardize the attributes. Do the same with the Iris dataset.

Q4. Run the Apriori algorithm to find frequent itemsets and association rules with the following parameters on any data set.

- Minimum support as 40% and minimum confidence as 80%.
- Minimum support as 50% and minimum confidence as 70%.

Q5. Use K-nearest neighbors algorithm to build classifiers. Divide the dataset into training and test sets and compare the accuracy of the different classifiers under the following situations:

a) Training set = 75%, Test set = 25%

b) Training set = 66.6% (2/3rd of total), Test set = 33.3%

The training set is chosen by: i) Holdout method

Q6. Use Decision tree classification algorithms to build classifiers. Divide the dataset into training and test sets and compare the accuracy of the different classifiers under the following situations:

a) Training set = 75%, Test set = 25%

b) Training set = 66.6% (2/3rd of total), Test set = 33.3%

The training set is chosen by: i) Random subsampling ii) Cross-Validation

Q7. Use the Simple K-means clustering algorithm to cluster the data. Compare the performance of clusters by changing the parameters involved in the algorithm.

Q8. Use the Hierarchical clustering algorithm to cluster the data. Compare the performance of clusters by changing the parameters involved in the algorithm.

## DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE 3B Minor project - 1

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Minor Project- 1 | 4 | 0 | 0 | 4 | Class XII Pass | NIL |

### Learning Objectives

The students will undergo one semester of project work based on the concepts studied in a subject oftheir choice. The objective is to train the students for the industry by exposing them to prototype development of real-life software.

### Learning Outcomes

On successful completion of this course, a student will be able to:

1. Develop a project plan based on the informal description of the project.
2. Implement the project as a team.
3. Write a report on the project work carried out by the team and defend the work done by the teamcollectively.
4. Present the work done by the team to the evaluation committee.

Each student shall carry out a minor project in the fifth semester. The students will work on any project based on the concepts studied in core/elective/skill-based elective courses. Specifically, the project could be a research study or a software development project.

**In case the student is opting for the research project**, students are required to select a relevant topic and carry out a detailed literature review followed by a critical analysis or implementation. The conclusions drawn from the analysis/ implementation must also be brought out in the form of a research paper.

**PROJECT GROUP ORGANIZATION/PLAN**

- Students will initially prepare a synopsis (500 words) and submit it to their respective department/supervisor. Only after obtaining the approval of supervisor, the student can initiate the Project work.
- For a given project, the group size could be a maximum of four (04) students.
- Each group will be assigned a teacher as a supervisor who will be responsible for their lab classes.
- A maximum of four (04) projects would be assigned to one teacher.

**PROJECT EVALUATION**

The project will be evaluated as follows:

**(a) Mid-semester evaluation** **25% weightage**

**(b) End-semester evaluation**

**(i) External Examination** **50% weightage**

Thesis/Project report - 25% of total marks.

Software Coding i) Documentation - 10% of total marks.

ii) Software - 15% of total marks.

**(ii) Viva-voce** **25% weightage**

- Practical/discussion sessions based on the area of the project. Work carried out in each lab session will be assessed out of five marks (zero for being absent). Finally, the marks obtained will be scaled out of a maximum marks of mid-semester evaluation (i.e. 25% of total marks).
- The end-**semester evaluation marks** to be awarded jointly by the examiner and supervisor / mentor.
- The **Mid-semester evaluation** to be awarded by the supervisor/mentor. Work carried out in each lab session will be assessed.

- The students will submit both the soft copy and the hard copy of the report.
- The reports may be retained by the examiners.

**PROJECT REPORT**

Two copies of the Project Report certified by the supervisor shall be submitted to the Department. The format of report can be downloaded from the website/guide/ coordinator.

DISCIPLINE SPECIFIC CORE COURSE – 16 Information Security and Cyber Laws

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre- requisite ofthe course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Information Security and Cyber Laws | 4 | 3 | 0 | 1 | Class XII Pass | NA |

## Learning Objectives

The course aims to introduce cyber threats, issues in information security, and contemporary cyber laws.

## Learning Outcomes

On successful completion of this course, a student will be able to:

1. Enumerate issues in information security.
2. Enumerate and describe common forms of attacks.
3. Describe the importance of security policy in the security framework.
4. Describe security related terms like cryptography, privacy, steganography.
5. Describe the need for cyber laws, and important provisions of IT Act.

## SYLLABUS OF DSC- 16

Unit 1 : Introduction (9 Hours)

Protection, security, risk, threat, flaw, vulnerability, exploit, attack, confidentiality, integrity, availability, non-repudiation, authentication, authorization, codes, ciphers, substitution cipher (Caesar), transposition cipher (Rail-Fence), public and private key cryptography, cyber forensics.

Unit 2 : Risk Analysis and Threat (9 Hours)

Risk analysis, key principles of conventional computer security, security policies, authentication, data protection, access control, internal Vs external threat, security assurance, passwords, computer forensics and incident response.

Unit 3 : Cyber Attacks and Digital Crime (9 Hours)

DoS attack, man-in-the-middle attack, phishing attack, spoofing attack, spam attack, drive-by attack, password attack, SQL injection attack, cross-site scripting attack, eavesdropping attack, birthday attack, malware attack, social engineering attack, session hijacking attack, criminology of computer crime, cyber forensics, cyber foot prints.

Unit 4 : Safety Tools and Issues (6 Hours)

Firewalls, logging and intrusion detection systems, e-mail security, digital signature, electronic signature, digital certificate, security issues in operating systems, ethics of hacking and cracking.

Unit 5 : Cyber laws to be covered as per IT Act (6 Hours)

- [Section 43] Penalty and compensation for damage to computer etc.
- [Section 65] Tampering with computer source documents
- [Section 66A] Punishment for sending offensive messages through communication service etc.
- [Section 66B] Punishment for dishonestly receiving stolen computer resource or communication device
- [Section 66C] Punishment for identity theft
- [Section 66D] Punishment for cheating by personation by using computer resource
- [Section 66E] Punishment for violation of privacy
- [Section 66F] Punishment for cyber terrorism
- [Section 67] Punishment for publishing or transmitting obscene material in electronic form
- [Section 67A] Punishment for publishing or transmitting of material containing sexually explicit act, etc. in electronic form
- [Section 67B] Punishment for publishing or transmitting of material depicting children in sexually explicit act, etc. in electronic form
- [Section 72] Breach of confidentiality and privacy

Unit 6 : Information Security in India (9 Hours)

Brief introduction of IT infrastructure for information security in India.

Essential Readings

1. Mark S. Merkow, Jim Breithaupt, Information Security: Principles and Practices, 5th Edition, Pearson

Education, 2014.

2. Gordon F. Snyder, Terry Pardoe, Network Security, Cengage Learning, 2010.

3. Michael E. Whitman, Herbert J. Mattod, Principles of Information Security, 5th Edition, Cengage Learning, 2015.

Suggested Readings

1. Alfred Basta, Wolf Halton, Computer Security: Concepts, Issues and Implementation, Cengage Learning, 2008.

2. Anderson Ross, Security Engineering: A Guide to Building Dependable Distributed Systems, 3rd Edition, Wiley, 2001.

Practical Component

1.Demonstrate the use of Network tools: ping, ipconfig, ifconfig, tracert, arp, netstat, whois
Suggested Readings: whois, ping, tracert, netstat, ifconfig.

2.Use of Password cracking tools : John the Ripper, Ophcrack. Verify the strength of passwords using these tools.

3. Perform encryption and decryption of Caesar cipher. Write a script for performing these operations.

4. Demonstrate sending of a protected word document.

5. Demonstrate sending of a digitally signed document.

6. Demonstrate sending of a protected worksheet.

7. Demonstrate creating users - Admin and Regular

8. Use “steghide” steganography tool to hide data in an image file

9. Use nmap/zenmap to analyse a remote machine.(optional)

10. Use Burp proxy to capture and modify the message. (optional)

11. Demonstrate use of steganography tools.(optional)

12. Demonstrate use of gpg utility for signing and encrypting purposes.(optional)

## DISCIPLINE SPECIFIC CORE COURSE – 17 E - Commerce

| Course title &Code | Credits | Credit distribution of the Course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| E- Commerce | 4 | 3 | 1 | 0 | Class XII Pass | NA |

### Learning Objectives

To enhance skills for effective and contemporary applications of E-commerce.

### Learning Outcomes

After completing the course, the student shall be able to:

1. Understand the basics of E-commerce, current and emerging business models.
2. Familiarize with basic business operations such as sales, marketing, HR etc. on the web.
3. Identify the emerging modes of e-payment.
4. Understand the importance of security, privacy, ethical and legal issues of e-commerce.

### SYLLABUS OF DSC- 17

Unit I: Introduction to E- Commerce (9 Hours)

Concepts and significance of E-commerce, driving forces of E-commerce. E-commerce business models – key elements of a business model and categories. Mechanism Dynamics of World Wide Web and internet-evolution and features; Design and launch of E-commerce website – decisions regarding Selection of hardware and software; Outsourcing vs in house development of a website.

Unit II: Online Business Transactions (12 Hours)

Rationale of transacting online, E-commerce applications in various industries (banking, insurance, payment

of utility bills and others), e-marketing, e-tailing, online services, e-auctions, online portal, online learning, e-publishing and e-entertainment, online shopping.

Unit III: E-payment System (12 Hours)

E-payment Methods- Debit card, Credit card, Smart cards, E-Money, E-Wallets; Digital Signatures - procedures and legal position; Payment gateways; Online banking- concepts, importance; Electronic fund transfer; Automated Clearing House. Automated Ledger Posting. Emerging modes and systems of E-payment (MPaisa, PayPal and other digital currency).E-payments risks.

Unit IV: Security and Legal Aspects of E-commerce (12 Hours)

E-commerce security – meaning and issues. Security threats in the E-commerce environment security intrusions and breaches, attacking methods like hacking, sniffing, cyber-vandalism etc.; Technology solutions- encryption, security channels of communication, protecting networks, servers and clients. Information Technology Act 2000- provisions related to offences, secure electronic records, digital signatures, penalties and adjudication.

Essential Readings:


- Kamlesh N. Agarwala, Amit Lal, Deeksha Agarwala, Business on the Net: An Introduction to the Whats and Hows of E-commerce, Macmillan India, 2000.
- K.K. Bajaj, Debjani Nag, E-Commerce: The cutting edge of Business, 2nd Edition, McGraw Hill, 2005.
- T.N. Chhabra, Hem Chand Jain, Aruna Jain, An Introduction to HTML, Dhanpat Rai & Co.(P) Ltd., 2017.
- Harvey M. Deitel, Paul J. Deitel, Kate Steinbuhler, E-Business and E-Commerce for Managers, Pearson, 2011.
- Parag Diwan, Sunil Sharma, Electronic Commerce - A Manager's Guide to E-Business, Vanity Books International, 2002.
- Elias M. Awad, Electronic Commerce: From Vision to Fulfillment, Third Edition, Prentice Hall of India.
- David Kosiur, Understanding Electronic Commerce, Prentice Hall of India.
- EfraimTurban, Jae K. Lee, David King, Michael Chung, Electronic commerce: A Managerial Perspective, Pearson, 2006.
- David Whiteley, E-Commerce: Strategy, Technologies and Applications, McGraw Hill, 2017.

## DISCIPLINE SPECIFIC CORE COURSE – 18 Android Programming

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Android Programming | 4 | 2 | 0 | 2 | Class XII Pass | NA |

### Learning objectives:

Creating robust mobile applications and learning how to integrate them with other services.

### Learning Outcomes:

1. Describe characteristics of Android operating system.
2. Describe components of an android applications.
3. Design user interfaces using various widgets, dialog boxes, menus.
4. Define interaction among various activities/applications using intents, broadcasting, and service.
5. Develop Android applications that require database handling.

### SYLLABUS OF DSC- 18

UNIT-I: Introduction (6 Hours)

Review to JAVA & OOPS Concepts, History of Android, Introduction to Android Operating Systems, Android Development Tools, and Android Architecture, Android components including activities, view and view group, services, content providers, broadcast receivers, intents, parcels, instance state.

UNIT-II: User Interface Architecture (8 Hours)

Application context, intents: explicit intents, returning results from activities, implicit intents, intent filter and intent resolution, and applications of implicit intents, activity life cycle, activity stack, application's priority and its process' states, fragments and its life cycle.

UNIT-III: User Interface Design (8 Hours)

Layouts, optimizing layout hierarchies, form widgets, text fields, button control, toggle buttons, spinners, images, menu, dialog.

UNIT-IV: Broadcast receivers and Database (8 Hours)

Broadcast sender, receiver, broadcasting events with intents, notifications and services. SQLite, Content Values and Cursors, creating SQLite databases, querying a database.

## Essential Readings:

1. Dawn Griffiths, David Griffiths, Head First Android Development, O'Reilly, 2015.
2. Reto Meier, Professional Android 4 Application Development, Wiley, 2012.

## Practical Component:

1. Create "Hello World" application. That will display "Hello World" in the middle of thescreen in the emulator. Also display "Hello World" in the middle of the screen in theAndroid Phone.
2. Create an application with login module. (Check username and password).
3. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
4. Create a menu with 5 options and and selected option should appear in text box.
5. Create a list of all courses in your college and on selecting a particular course teacher-incharge of that course should appear at the bottom of the screen.
6. Create an application with three option buttons, on selecting a button colour of the screen will change.
7. Create and Login application as above. On successful login, pop up the message.
8. Create an application to Create, Insert, update, Delete and retrieve operation on the database.

## DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE 4A Graphic Design

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisite of the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Graphic Design | 4 | 3 | 0 | 1 | Class XII Pass | NA |

Learning Objectives

The objective of this course is to learn to create a combination of shapes and forms, words and images, in order to reproduce them in some flat medium (two dimensional - paper, cardboard, cloth, plastic, video, computer, or projection screen, on poster, billboard, or other signage) or in a three-dimensional form (fabricated or manufactured) in order to convey information to a targeted audience.

### Learning Outcomes

On successful completion of the course, students will be able to:

1. Corel draw is a graphic design software coral draw enables users to create professional Illustrations for newsletters, brochures logos and web graphics.
2. Provides training about illustration program that can be used for print, multimedia, and online graphics. Whether you plan to design or illustrate multimedia artwork illustrator offers all the tools needed to produce professional and quality results for even a beginner.
3. Important tool for graphic artists, print designers, visual communicators, and other regular peoples.

### SYLLABUS OF DSE-4B

Unit 1: Introduction (6 Hours)

Introduction of Raster and vector Software' show they used in different scenario of digital platform. Introduction of software's and user interface.

Unit 2: Photoshop (9 Hours)

Making sketches in Photoshop, customize the workspace, create projects, Basic tools settings and brush options, Color theory and light painting, Selection tools and cropping images, Image manipulation process pipeline. Raster vs. Vector.

Unit 3: Layer (15 Hours)

Introduction of layer, Use the Layers Panel, Layer Dexterity, Fast Alignments Layer Types Explained, Manipulate Layers in Photoshop, Use Blending Modes, Find out how art boards can help you, Creating and resizing art boards, Introduction Photoshop vs. Illustrator, Tools explained and making digital paintings.

Unit 4: Image effects (9 Hours)

Color correction images, Image Manipulation, Digital painting concepts, Matte painting process, Different Ways to Paint, Background and Final Effects.

Unit 5: 3D tool (6 Hours)

Make 3D text & 3D logos, Adding lights & casting shadows using Photoshop 3D, How make a reusable mock-up in Photoshop using smart objects, How to make a simple UI app web design mock-up using Photoshop.

Essential Readings:

1. Nobuhiko Mukai, Computer Graphics, InTech, 2012.
2. Robert Bridson, Fluid Simulation for Computer Graphics, 2nd edition, A K Peters/CRC Press, 2015.
3. Max Wainewright, Design, Animate, and Create with Computer Graphics, Qeb Pub; Illustrated edition, 2017.

Practical Component:

1. Create a digital sketch using Photoshop. Include at least three different brush options and demonstrate the use of layers to organize your artwork.
2. Apply color theory principles to create a digital artwork emphasizing light painting techniques.
3. Use selection tools in Photoshop to isolate and crop an image. Provide a before-and-after comparison, highlighting the effectiveness of your cropping technique.
4. Manipulate layers in Photoshop to create a composite image. Use at least three different blending modes to achieve distinct effects.
5. Create a digital painting using advanced layer techniques. Demonstrate the use of layer opacity and blending modes to enhance depth and texture in your artwork.
6. Correct the colors of a provided photograph using adjustment layers in Photoshop.
7. Combine digital painting techniques with photo manipulation to create a matte painting. Include at least two different painting styles.
8. Design a 3D text or logo using Photoshop's 3D tools. Experiment with different lighting and shadow effects to enhance the visual impact of your design.
9. Create a simple UI app web design mock-up using Photoshop. Use smart objects to mock-up reusable elements such as buttons and icons.

## DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE 4B Minor Project-2

| Course title & Code | Credits | Credit distribution of the course | | | Eligibility criteria | Pre-requisiteof the course (if any) |
|---|---|---|---|---|---|---|
| | | Lecture | Tutorial | Practical/ Practice | | |
| Minor Project-2 | 4 | 0 | 0 | 4 | Class XII Pass | DSE 3B |

### Learning Objectives:

The students will undergo one semester of project work based on the concepts studied in a subject of their choice. The objective is to train the students for the industry by exposing them to prototype development of real-life software.

### Learning Outcomes:

On successful completion of this course, a student will be able to:

1. Develop a project plan based on the informal description of the project.
2. Implement the project as a team.
3. Write a report on the project work carried out by the team and defend the work done by the team collectively.
4. Present the work done by the team to the evaluation committee.

Each student shall carry out a minor project in the sixth semester that can be a continuation of advancement in Minor Project-1 or can be done from scratch. The students will work on any project based on the concepts studied in core/elective/skill-based elective courses. Specifically, the project could be a research study or a software development project.

In case the student is opting for research project, students are required to select a relevant topic, carryout a detailed literature review followed by a critical analysis or implementation. The conclusions drawn from the analysis/ implementation must also be brought out in the form of a research paper.

PROJECT GROUP ORGANIZATION/PLAN

- Students will initially prepare a synopsis (500 words) and submit it to their respective department/supervisor. Only after obtaining the approval of supervisor, the student can initiate the
- Project work.
- For a given project, the group size could be a maximum of four (04) students.
- Each group will be assigned a teacher as a supervisor who will be responsible for their lab classes.
- A maximum of four (04) projects would be assigned to one teacher.

PROJECT EVALUATION

The project will be evaluated as follows:

(a) Mid-semester evaluation 25% weightage

(b) End-semester evaluation

(i) External Examination 50% weightage

Thesis/Project report - 25% of total marks.

Software Coding i) Documentation - 10% of total marks.

ii) Software - 15% of total marks.

(ii) Viva-voce 25% weightage

- Practical/discussion sessions based on the area of the project. Work carried out in each lab session will be assessed out of five marks (zero for being absent). Finally, the marks obtained will be scaled out of a maximum marks of mid-semester evaluation (i.e. 25% of total marks).
- The end-semester evaluation marks to be awarded jointly by the examiner and supervisor / mentor.
- The Mid-semester evaluation to be awarded by the supervisor/mentor. Work carried out in each lab session will be assessed.
- The students will submit both the soft copy and the hard copy of the report.
- The reports may be retained by the examiners.

PROJECT REPORT

Two copies of the Project Report certified by the supervisor shall be submitted to the Department.

The format of report can be downloaded from the website/guide/ coordinator.