

SRI VENKATESWARA UNIVERSITY
BCA (General) Honours– W.E.F. 2025-26

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
III	V	12	Mobile application development using ANDROID	3	3
			Mobile application development using ANDROID Lab	2	1
		13	Web Development Using PHP & MySQL	3	3
			Web Development Using PHP & MySQL Lab	2	1
		14 A	Cloud Computing	3	3
			Cloud Computing Lab	2	1
		14 B	Software Testing	3	3
			Software Testing Lab	2	1
		15 A	Machine Learning	3	3
			Machine Learning Lab	2	1
		15 B	Foundations of Data Science	3	3
			Foundations of Data Science Lab	2	1

Note:

choose either Set-A (14 A and 15 A) (or) Set-B (14 B and 15 B)

SRI VENKATESWARA UNIVERSITY::TIRUPATI
BCA General Honours
III Year V Semester
COURSE 12: MOBILE APPLICATION DEVELOPMENT USING ANDROID
(w.e.f. 2025-26)

Theory

Credits: 3

3 hrs/week

COURSE OBJECTIVES:

1. To facilitate students' understanding of the android SDK
2. To help students gain basic understanding of Android application development
3. To instill working knowledge of the Android Studio development tool

COURSE OUTCOMES:

The theory, practical experiences and relevant skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry-oriented Cos associated with the above-mentioned competency:

1. Identify various concepts and features of Android operating system.
2. Configure Android environment and development tools.
3. Develop rich user Interfaces by using layouts and controls.
4. Use User Interface components for android application development.
5. Create Android application using database.
6. Publish Android applications.

UNIT-I

Introduction to Android:- Overview, History, Features of Android, The Android Platform, Understanding the Android Software Stack –Android Development Environment -Android SDK, Android Installation, Building you First Android application.

Case Study:

- i. Give a brief description of Android Architecture and its parts.
- ii. List out the challenges we face while using Android?
- iii. List the new features of Android in the latest version.

UNIT-II

Android Application Design Essentials: Understanding Anatomy of Android Application, Android terminologies, Creating User Interfaces with basic views- Application Context, Activities, Services, Intents, linking activities with Intents, Receiving and Broad casting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

Case Study:

- i. Present an idea that you would like to convert it into an application in the future.

UNIT-III

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation. Layouts, Recycler View, List View, Grid View and Web view

Input Controls: Buttons, Checkboxes, Radio Buttons, Toggle Buttons, Spinners, Input Events, Menus, Toast, Dialogs, Styles and Themes, Creating lists, and Custom lists

Case Study:

- i. Present detail report on the features of Check Boxes, Radio Buttons and Toggle Buttons.

UNIT-IV

Testing Android applications: Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

Case Study:

1. List out the special features of Android with its counterparts.

UNIT-V

Using Common Android APIs: Internal Storage, External Storage, SQLite Databases, managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs.

Case Study:

- i. List out the points to keep in mind to make you application more attractive.
- ii. List the controls that make your application attractive.

REFERENCE BOOKS:

1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2nd ed. (2011)
2. Google Developer Training, "Android Developer Fundamentals Course – Concept Reference”, Google Developer Training Team, 2017.
3. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd
4. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
5. “Android Application Development All in one for Dummies” by Barry Burd, Edition: I
6. “Android”, Dixit, Prasanna Kumar Vikas Publications, New Delhi 2014, ISBN: 9789325977884
7. Maclean David, Komatineni Satya, Allen Grant, “Pro Android 5”, Apress Publications 2015 ISBN: 978-1-4302-4680-0
8. ”Android Programming for Beginners” by Horton, John, Packet Publication, 2015 ISBN: 978-1-78588-326-2

ONLINE READING/ SUPPORTING MATERIAL:

1. <http://www.developer.android.com>
2. <http://developer.android.com/about/versions/index.html>
3. <http://developer.android.com/training/basics/firstapp/index.html>
4. <http://docs.oracle.com/javase/tutorial/index.htm>(Available in the form of free downloadable ebooks also).
5. <http://developer.android.com/guide/components/activities.html>
6. <http://developer.android.com/guide/components/fundamentals.html>
7. <http://developer.android.com/guide/components/intents-filters.html>.
8. <http://developer.android.com/training/multiscreen/screensizes.html>
9. <http://developer.android.com/guide/topics/ui/controls.html>
10. <http://developer.android.com/guide/topics/ui/declaring-layout.html>
11. <http://developer.android.com/training/basics/data-storage/databases.html>

BCA General Honours

III Year V Semester

COURSE 12: MOBILE APPLICATION DEVELOPMENT USING ANDROID

Practical

Credits: 1

2hrs/week

LIST OF EXPERIMENTS:

1. Develop a program to implement frame layout, table layout and relative layout.
2. Develop a program to implement Text View and Edit Text.
3. Develop a program to implement Auto Complete Text View.
4. Develop a program to implement Button, Image Button and Toggle Button.
5. Develop a program to implement login window using above UI controls.
6. Develop a program to implement Checkbox.
7. Develop a program to implement Radio Button and Radio Group.
8. Develop a program to implement Progress Bar.
9. Develop a program to implement List View, Grid View, Image View and Scroll View.
10. Develop a program to implement Custom Toast Alert.
11. Develop a program to implement Date and Time Picker.
12. Develop a program to create an activity. Develop a program to implement new activity using explicit intent and implicit intent.
13. Develop a program to implement content provider.
14. Develop a program to implement service.
15. Develop a program to implement broadcast receiver.
16. Develop a program to implement sensors.
17. Develop a program to build Camera.
18. Develop a program for providing Bluetooth connectivity.
19. Perform CRUD operations using SQLite.

MODEL QUESTION PAPER
SRI VENKATESWARA UNIVERSITY::TIRUPATI
BCA General Honours
III Year V Semester

COURSE 12: MOBILE APPLICATION DEVELOPMENT USING ANDROID
(w.e.f. 2025-26)

Time : 3 Hrs

Max Marks : 75

SECTION - A

Answer any Five of the following

5 X 3= 15 Marks

1. Short answer question from Unit-1
2. Short answer question from Unit-1
3. Short answer question from Unit-2
4. Short answer question from Unit-2
5. Short answer question from Unit-3
6. Short answer question from Unit-3
7. Short answer question from Unit-4
8. Short answer question from Unit-4
9. Short answer question from Unit-5
10. Short answer question from Unit-5

SECTION - B

Answer any Five of the following

5 X 12= 60 Marks

11. Long answer question from Unit-1
12. Long answer question from Unit-1
13. Long answer question from Unit-2
14. Long answer question from Unit-2
15. Long answer question from Unit-3
16. Long answer question from Unit-3
17. Long answer question from Unit-4
18. Long answer question from Unit-4
19. Long answer question from Unit-5
20. Long answer question from Unit-5

Note: The question paper setter is requested to set question paper based on a model question paper and ensure coverage across all units equally.

SRI VENKATESWARA UNIVERSITY::TIRUPATI
BCA General Honours
III Year V Semester
COURSE 13: WEB DEVELOPMENT USING PHP & MYSQL
(w.e.f. 2025-26)

Theory

Credits: 3

3 hrs/week

Course Outcomes: Upon completion of the course, students will be able to

1. Write simple programs in PHP.
2. Understand how to use regular expressions, handle exceptions, and validate data.
3. Apply built-in functions and create user-defined functions in PHP programming.
4. Write PHP scripts to handle HTML forms.
5. Write programs to create dynamic and interactive web-based applications using PHP and MYSQL.
6. Know how to use PHP with MySQL DB and can write database driven web pages.

Unit-I:

Using PHP: PHP Basics: Accessing PHP, Creating Sample Application, Embedding PHP in HTML, Adding Dynamic Content, Identifiers, Variables, Constants, Operators, Data types, Accessing Form Variables, Variable handling Functions, Making Decisions with Conditions, Repeating actions through Iterations, Breaking Out of a Control Structure

Storing and Retrieving Data: Processing Files, opening a File, writing to a File, closing a File, Reading from a File, Other File Functions, Locking Files.

CASE STUDY: Web Based Social Network Application Development

Unit-II:

Arrays: Arrays basics, Types, Operators, Array Manipulations.

String Manipulation and Regular Expressions: Strings Basics, Formatting Strings, Joining and Splitting Strings with String Functions, Comparing Strings, Matching and Replacing Substrings with String Function, Introducing Regular Expressions, Find, Replace, Splitting in Regular Expressions

CASE STUDY: Retail E-commerce Application Development for Apparels & Garments

Unit-III:

Reusing Code and Writing Functions: advantages of Reusing, Using require () and include (), Using Functions in PHP, Scope, Passing by Reference Versus Passing by Value, keyword, Recursion.

Object-Oriented PHP: OOP Concepts, Creating Classes, Attributes, and Operations in PHP, Implementing Inheritance in PHP, Understanding Advanced Object-Oriented Functionality in PHP.

Error and Exception Handling: Error and Exception Handling, Exception Handling Concepts.

CASE STUDY: e-Commerce Application for Manufacturing Industry

Unit-IV:

Using MySQL: Relational Database Concepts, Web Database Architecture, Introducing MySQL's

Privilege System, Creating Database Tables, Understanding MySQL, Identifiers, Database Operations, querying a Database, Understanding the Privilege System, Making Your MySQL Database Secure, Optimization, Backup, Restore.

CASE STUDY: Custom CMS Website Development

Unit-V:

Introduction of Laravel PHP Framework: Why Laravel, setting up Laravel Development Environment, Routing and Controllers: introduction to MVC, the HTTP verbs, and REST, Route Definitions, Route Groups, Signed Routes, Views, Controllers, Route Model Binding, Redirects, Custom Responses

Case Study: E-commerce Business Solution delivered for Groceries Vendor

Prescribed Text Books:

1. Luke Welling, Laura Thomson, “PHP and MySQL Web Development”, 5th Edition
2. Matt Stauffer, “Laravel: Up & Running”, 2nd Edition
3. Julie C. Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education (2007).
4. Steven Holzner, PHP: The Complete Reference, McGraw-Hill
5. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly, 2014
6. Xue Bai Michael Ekedahl, The web warrior guide to Web Programming, Thomson (2006).
7. Web resources:
 - <http://www.codecademy.com/tracks/php>
 - <http://www.w3schools.com/PHP>
 - <http://www.tutorialpoint.com>
8. Other web sources suggested by the teacher concerned and the college librarian including reading material.

BCA General Honours
III Year V Semester
COURSE 13: WEB DEVELOPMENT USING PHP & MYSQL

Practical

Credits: 1

2hrs/week

LIST OF EXPERIMENTS:

Course Outcomes: On successful completion of this practical course, student shall be able to:

- Write, debug, and implement the programs by applying concepts and PHP error handling techniques.
- Create an interactive and dynamic website.
- Create a website with reports generated from a database.
- Create an interactive website for e-commerce sites like online shopping, etc.

Practical (Laboratory) Syllabus: (30 hrs.)

1. Write a PHP program to Display “Hello”, and today’s date.
2. Write a PHP program to display Fibonacci series.
3. Write a PHP Program to read the employee details.
4. Write a PHP program to prepare the student marks list.
5. Write a PHP program to generate the multiplication of two matrices.
6. Create student registration form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
7. Create Website Registration Form using text box, check box, radio button, select, submit button. And display user inserted value in new PHP page.
8. Write PHP script to demonstrate passing variables with cookies.
9. Write a program to keep track of how many times a visitor has loaded the page.
10. Write a PHP application to add new Rows in a Table.
11. Write a PHP application to modify the Rows in a Table.
12. Write a PHP application to delete the Rows from a Table
13. Write a PHP application to fetch the Rows in a Table.
14. Develop an PHP application to implement the following Operations. Registration of Users. Insert the details of the Users. Modify the Details. Transaction Maintenance. No of times Logged in Time Spent on each login. Restrict the user for three trials only. Delete the user if he spent more than 100 Hrs of transaction.
15. Write a PHP script to connect MySQL server from your website.
16. Write a program to read customer information like cust-no, cust-name, item purchased, and mob- no, from customer table and display all these information in table format on output screen.
17. Write a program to edit name of customer to “Kiran” with cust-no =1, and to delete record with cust-no=3.
18. Write a program to read employee information like emp-no, emp-name, designation and salary from EMP table and display all this information using table format.
19. Create a dynamic web site using PHP and MySQL.

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III Year V Semester
COURSE 13: WEB DEVELOPMENT USING PHP & MYSQL
(w.e.f. 2025-26)

Time : 3 Hrs

Max Marks : 75

SECTION - A

Answer any Five of the following

5 X 3= 15 Marks

1. Short answer question from Unit-1
2. Short answer question from Unit-1
3. Short answer question from Unit-2
4. Short answer question from Unit-2
5. Short answer question from Unit-3
6. Short answer question from Unit-3
7. Short answer question from Unit-4
8. Short answer question from Unit-4
9. Short answer question from Unit-5
10. Short answer question from Unit-5

SECTION - B

Answer any Five of the following

5 X 12= 60 Marks

11. Long answer question from Unit-1
12. Long answer question from Unit-1
13. Long answer question from Unit-2
14. Long answer question from Unit-2
15. Long answer question from Unit-3
16. Long answer question from Unit-3
17. Long answer question from Unit-4
18. Long answer question from Unit-4
19. Long answer question from Unit-5
20. Long answer question from Unit-5

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SRI VENKATESWARA UNIVERSITY::TIRUPATI

BCA General Honours

III Year V Semester

COURSE 14 A: CLOUD COMPUTING

(w.e.f. 2025-26)

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. This course introduces the basic principles of cloud computing, Cloud Computing models and Services, Virtualization Techniques, Resource Sharing, Load Balancing and Security issues in Cloud Computing.
2. It will also equip the students to understand major industry players in the public cloud domain.

Course Outcomes: Upon Completion of the course, the students will be able to

1. Understand the basic principles of cloud computing.
2. Analyze different types of cloud services – Cloud Computing Models and Cloud Computing Services.
3. Understand Virtualization techniques
4. Use different Cloud Platforms
5. Learn different File systems and Security issues in Cloud Computing Platforms

Unit-I: Introduction to Cloud Computing, Evaluation and Enabling Technologies, Benefits and Challenges, Cloud Computing Model

CASE STUDY: Identify different types of Public Cloud, Private Cloud, and Hybrid Cloud

Unit-II: Cloud Computing Services, Elements of Cloud Security model, Cloud Security reference model, Examining Cloud Security against traditional computing, Security Policy

CASE STUDY: Identify various real-time examples of Cloud Computing Services and work with them

Unit-III: Virtualization basics, Machine or Server Level Virtualization, Major Server virtualization products and vendors, Types of Virtualization, Advantages and Disadvantages of Virtualization, Virtualization Security Threats

CASE STUDY: Install any Virtualization Software and Perform any task

Unit-IV: Resource Pooling and Sharing, Multi-tenancy, Resource Provisioning, Scaling, Scaling strategies in Cloud, Types of Scaling, Load balancing in Cloud, Categories of Load Balancing, Service Oriented Architecture (SOA), Elements of a service, Benefits of SOA

CASE STUDY: Perform different operations using Google Cloud and Amazon Elastic Compute Cloud (EC2)

Unit-V: Cloud Native File System, Storage types, Relational DBMS in Cloud, Non-Relational DBMS in Cloud, Cloud Security, Treats to cloud security, Infrastructure Security in Cloud, Information Security in Cloud, Identity Management and Access Control

CASE STUDY: Identify and work with Popular cloud storages for developers, Popular General Purpose Cloud Storages

Prescribed Text Books:

1. **Cloud Computing: Sandeep Bhowmik , Cambridge University Press**
2. **CLOUD COMPUTING:Principles and Paradigms by Rajkumar Buyya, James Broberg, Andrzej Goscinski**
3. **The Definite Guide to Cloud Computing by Dan Sullivan**

BCA General Honours
III Year V Semester
COURSE 14 A: CLOUD COMPUTING

Practical

Credits: 1

2hrs/week

LIST OF EXPERIMENTS:

Course Outcomes: Upon Completion of the course, the students will be able to

1. Working with Virtual machines.
2. Run simple programs on virtual box.
3. Acquire knowledge in Google App Engine
4. Get practical exposure on CloudSim

Experiments:

1. Install Virtualbox / VMware Workstation with different flavours of linux or windows OS on top of windows10 or 11.
2. Install a C compiler in the virtual machine created using virtual box and execute Simple Programs
3. Install Google App Engine. Create hello world app and other simple web applications using python/java.
4. Use GAE launcher to launch the web applications.
5. Simulate a cloud scenario using CloudSim and run a scheduling algorithm that is not present in CloudSim.
6. Find a procedure to transfer the files from one virtual machine to another virtual machine.
7. Find a procedure to launch virtual machine using trystack (Online Openstack Demo Version)

Web Resources:

1. [Cloud Computing Fundamentals Labs - Cloud Academy](#)

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III Year V Semester
COURSE 14 A: CLOUD COMPUTING
(w.e.f. 2025-26)

Time : 3 Hrs

Max Marks : 75

SECTION - A

Answer any Five of the following

5 X 3= 15 Marks

1. Short answer question from Unit-1
2. Short answer question from Unit-1
3. Short answer question from Unit-2
4. Short answer question from Unit-2
5. Short answer question from Unit-3
6. Short answer question from Unit-3
7. Short answer question from Unit-4
8. Short answer question from Unit-4
9. Short answer question from Unit-5
10. Short answer question from Unit-5

SECTION - B

Answer any Five of the following

5 X 12= 60 Marks

11. Long answer question from Unit-1
12. Long answer question from Unit-1
13. Long answer question from Unit-2
14. Long answer question from Unit-2
15. Long answer question from Unit-3
16. Long answer question from Unit-3
17. Long answer question from Unit-4
18. Long answer question from Unit-4
19. Long answer question from Unit-5
20. Long answer question from Unit-5

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SRI VENKATESWARA UNIVERSITY::TIRUPATI

BCA General Honours

III Year V Semester

COURSE 14B: SOFTWARE TESTING

(w.e.f. 2025-26)

Theory

Credits: 3

3 hrs/week

Course Objectives

1. To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
2. Analysis of various testing methodologies and procedure to design test cases.

Course Outcomes:

1. Analyze requirements to determine appropriate testing strategies.
2. Apply a wide variety of testing techniques in an effective and efficient manner.
3. Compute test coverage and yield according to a variety of criteria.
4. Evaluate the limitations of a given testing process and provide a succinct summary of those limitations.

UNIT I

Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs.

Flow graphs and Path testing: Basics concepts of path testing, predicates, path predicates and Achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT II

Introduction to Testing Design Strategies – The Smarter Tester – Test Case Design Strategies

Test Case Design Black-Box Approach - Using Black Box Approach to Test Case Design Random Testing – Requirements based testing – Boundary Value Analysis – decision tables - Equivalence Class Partitioning- state based testing– cause effect graphing – error guessing - compatibility testing – user documentation testing – domain testing.

UNIT III

Test Case Design White-Box Approach-Using White-Box Approach to Test design – Test Adequacy Criteria–static testing vs. structural testing–code functional testing– Coverage and Control Flow Graphs –Covering Code Logic– Paths–Their Role in White-box Based Test Design– code complexity testing– Evaluating Test Adequacy Criteria.

UNIT IV

Paths, Path products and Regular expressions: path products & path expression, reduction Procedure, applications, regular expressions & flow anomaly detection. **Logic Based Testing:** overview, decision tables, path expressions, kv charts, specifications.

UNIT V

State, State Graphs and Transition testing: state graphs, good & bad state graphs, state testing, Testability tips. **Graph Matrices and Application:** Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools. (Student should be given an exposure to tools like Win runner, QTP, Selenium, Jmeter).

TEXT BOOKS:

1. Software Testing techniques, Boris Beizer, Dreamtech, Second Edition
2. Srinivasan Desikan and Gopalaswamy Ramesh, “Software Testing – Principles and Practices”, Pearson education, 2006.
3. Software Testing Tools, Dr. K. V . K . K. Prasad, Dreamtech.

REFERENCES:

1. The craft of software testing- Brian Marick, Pearson Education.
2. Software Testing, Third Edition, P.C.Jorgensen, Aurbach Publications(Dist.bySPD).
3. Software Testing, N.Chauhan, Oxford University Press.
4. Introduction to Software Testing, P.Ammann and J.Offutt, Cambridge Univ. Press.
5. Effective methods of Software Testing, Perry, John Wiley, Second Edition, 1999.
6. Software Testing Concepts and Tools, P.Nageswara Rao, Dreamtech Press.
7. Software Testing, M.G.Limaye, TMH.
8. Software Testing, Desikan, G.Ramesh, Pearson.
9. Foundations of Software Testing, D.Graham and Others, Cengage Learning.
10. Foundations of Software Testing, A.P.Mathur, Pearson.
11. Ilene Burnstein, "Practical Software Testing", Springer International Edition, Chennai, 2003

BCA General Honours
III Year V Semester
COURSE 14B: SOFTWARE TESTING

Practical

Credits: 1

2hrs/week

LIST OF EXPERIMENTS:

Experiment 1: Write a “C” program to demonstrate the working of if...else

AIM: To demonstrate the working of “if...else”

Objective: To understand the working of if...else in Various Test cases

Experiment 2: Write a “C” program to demonstrate the working of “while Loop”

AIM: To demonstrate the working of “while Loop”

Objective: To understand the working of “while” 4 loop in Various Test cases

Experiment 3: Write a “C” program to demonstrate the working of the “do... while” constructs:

AIM: To demonstrate the working of “do..while” construct

Objective: To understand the working of “do while ”with different range of values and Test Cases

Experiment 4: Write a “C” Program To demonstrate the working of “switch...case” construct

Aim: To demonstrate the working of “switch...case” construct

Objective: To understand the working of “switch...case” with different range of values and Test Cases

Experiment 5: Write a “C” program to demonstrate the working of “for Loop”

AIM: To demonstrate the working of “for Loop”

Objective: To understand the working of “for loop in Various Test cases

Experiment 6: Write a Python program to Sort n numbers

AIM: To demonstrate the testing of Sorting program

Objective: To understand the working of Sorting with Various range of numbers &Test cases

Experiment 7: Write a Java Program to Test Binary Search process

AIM: To demonstrate the Binary Search program using Java

Objective: To understand the working of Binary Search with different Test cases

Experiment 8: ATM System with various Case studies

Aim: A program written in ‘Java’ language for ATM Maintenance

Objective: Maintain ATM Machine with various functionality and to find Bugs

Experiment 9: Test cases for any known application

Aim: To Write Test cases for known application - Banking

Objective: To Write test cases for Banking Applications with various test cases

Experiment 10: Create a test plan document for any application (e.g. Library Management System)

Aim: To Create a test plan document for Library Management System

Objective: To study about Create a test plan document for Library Management System

Sample Test Cases for Library Management System

Experiment 11: Study of any web testing tool

Aim: Study of Web Testing Tool - Selenium Test Tool

Objective: To Study of Selenium Test Tool

MODEL QUESTION PAPER
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BCA General Honours
III Year V Semester
COURSE 14B: SOFTWARE TESTING
(w.e.f. 2025-26)

Time : 3 Hrs

Max Marks : 75

SECTION - A

Answer any Five of the following

5 X 3= 15 Marks

1. Short answer question from Unit-1
2. Short answer question from Unit-1
3. Short answer question from Unit-2
4. Short answer question from Unit-2
5. Short answer question from Unit-3
6. Short answer question from Unit-3
7. Short answer question from Unit-4
8. Short answer question from Unit-4
9. Short answer question from Unit-5
10. Short answer question from Unit-5

SECTION - B

Answer any Five of the following

5 X 12= 60 Marks

11. Long answer question from Unit-1
12. Long answer question from Unit-1
13. Long answer question from Unit-2
14. Long answer question from Unit-2
15. Long answer question from Unit-3
16. Long answer question from Unit-3
17. Long answer question from Unit-4
18. Long answer question from Unit-4
19. Long answer question from Unit-5
20. Long answer question from Unit-5

Note: The question paper setter is requested to set question paper based on a model question paper and ensure coverage across all units equally.

SRI VENKATESWARA UNIVERSITY::TIRUPATI

BCA General Honours

III Year V Semester

COURSE 15A: MACHINE LEARNING

(w.e.f. 2025-26)

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. To learn the basics of machine learning
2. To learn the importance of feature engineering
3. To understand the foundational rules of probability
4. To study different classification and clustering techniques
5. To understand the basics of neural network concepts

Course Outcomes: Upon Completion of the course, the students will be able to

1. Develop an appreciation for what is involved in Learning models from data
2. Understand a wide variety of learning algorithms
3. Understand how to evaluate models generated from data
4. Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models
5. Understand different neural network concepts

Unit-I:

Introduction to Machine Learning: Introduction, what is human learning, types of human learning, what is machine learning, types of machine learning, problems not to be solved using machine learning, Applications of machine learning, Tools in machine learning, Issues in machine learning

Preparing to Model: Machine learning activities, Basic types of data in machine learning, Exploring structure of data, Data quality and remediation, Data Preprocessing

Case Study: Machine Learning **Case Study** on Trendyol

Unit-II:

Modelling and Evaluation: Selecting a model, Training a model, Model representation, and Interpretability, Evaluating Performance of a model, Improving performance of a model

Basics of Feature Engineering: Introduction, Feature transformation, Feature subset selection

Case Study: Machine Learning **Case Study** On Harley Davidson

Unit-III:

Brief Overview of Probability: Importance of Statistical Tools in Machine Learning, Concept of Probability, Random Variables, Some Common Discrete Distributions, Some Common Continuous Distributions, Multiple Random Variables, Sampling Distributions, Hypothesis Testing

Bayesian Concept Learning: Why Bayesian methods are important, Bayes Theorem, Concept Learning, Bayesian Belief Network

Case Study: Machine Learning **Case Study** on Tesla

Unit-IV:

Supervised Learning : Classification: Example of Supervised Learning, Classification Model, Classification Learning Steps, Common Classification Algorithms

Super vided Learning : Regression: Example of Regression, Common Regression Algorithms

Unsupervised Learning: Unsupervised vs Supervised Learning, Application of Unsupervised Learning, Clustering, Finding Pattern using Association Rule

Case Study: Predicting Heart Failure in Mobile Health

Unit-V:

Basics of Neural Network: Understanding Biological Neuron, Exploring the Artificial Neuron, Types of Activation Functions, Early Implementations of ANN, Architectures of Neural Network, Learning Process in ANN, Back Propagation, Deep Learning

Other Types of Learning: Representation Learning, Active Learning Vs Memory based Learning, Ensemble Learning Algorithm

Case Study: American Cancer Society on Google Cloud ML Engine

Prescribed Text Books:

1. Machine Learning, Pearson by Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das
2. Introduction to Machine Learning with Python: A Guide for Data Scientists by Andreas C. Muller & Sarah Guido
3. Machine Learning for Absolute Beginners, 2nd Edition by Oliver Theobald
4. Machine Learning for Dummies: IBM Limited Edition by Judith Hurwitz and Daniel Kirsch

BCA General Honours
III Year V Semester
COURSE 15A: MACHINE LEARNING

Practical

Credits: 1

2hrs/week

LIST OF EXPERIMENTS:

Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Execute basic programs in either Python or R.
2. Gain practical knowledge on different python libraries/packages .
3. Implement different machine learning algorithms

Implement the following using in either Python or R Language

1. Introduction to basic commands:

- a) Get and Set Working Directory
- b) See Directory Content
- c) Install and Load Packages
- d) Compile Source File for Execution
- e) Commands for basic user input/output
- f) Basic Data Types and Data Manipulation Functions

2. Introduction to basic commands Continued:

- a) Conditional Statements
- b) Loops
3. Data Manipulation Package installation and different operations using installed package
4. Standard Library function to plot the Graphs
5. Basic Data Exploration on any dataset available publicly
6. Starting to Model to find accuracy of the model
7. Learning Algorithms-kNN Linear Regression
8. Unsupervised Algorithm- k-means
9. Supervised Algorithm- Naïve Bayes
10. Implement Decision Tree and Support Vector Machine using Library Functions
11. Implement Neural Network using Library Function

MODEL QUESTION PAPER
SRI VENKATESWARA UNIVERSITY::TIRUPATI
BCA General Honours
III Year V Semester
COURSE 15A: MACHINE LEARNING
(w.e.f. 2025-26)

Time : 3 Hrs

Max Marks : 75

SECTION - A

Answer any Five of the following

5 X 3= 15 Marks

1. Short answer question from Unit-1
2. Short answer question from Unit-1
3. Short answer question from Unit-2
4. Short answer question from Unit-2
5. Short answer question from Unit-3
6. Short answer question from Unit-3
7. Short answer question from Unit-4
8. Short answer question from Unit-4
9. Short answer question from Unit-5
10. Short answer question from Unit-5

SECTION - B

Answer any Five of the following

5 X 12= 60 Marks

11. Long answer question from Unit-1
12. Long answer question from Unit-1
13. Long answer question from Unit-2
14. Long answer question from Unit-2
15. Long answer question from Unit-3
16. Long answer question from Unit-3
17. Long answer question from Unit-4
18. Long answer question from Unit-4
19. Long answer question from Unit-5
20. Long answer question from Unit-5

Note: The question paper setter is requested to set question paper based on a model question paper and ensure coverage across all units equally.

SRI VENKATESWARA UNIVERSITY::TIRUPATI
BCA General Honours
III Year V Semester
COURSE 15B: FOUNDATIONS OF DATA SCIENCE
(w.e.f. 2025-26)

Theory

Credits: 3

3 hrs/week

Course Objectives:

1. To understand the data science fundamentals and process.
2. To learn to describe the data for the data science process.
3. To learn to describe the relationship between data.
4. To utilize the Python libraries for Data Wrangling.
5. To present and interpret data using visualization libraries in Python

Course Outcomes: Upon Completion of the course, the students will be able to

1. Define the Data Science
2. Understand the Flow of Data science
3. Identify different steps in Data Science
4. Learn the Ipython basics
5. Learn data loading and manipulation techniques
6. Work with different data visualization techniques

Unit-I:

Benefits and uses of data science and big data, the big data eco system and data science, the data science process: Overview of data science process, Different steps in data science process: Research Goal, Retrieving data, Cleansing, integrating and transforming data, Exploratory data analysis, Build the models, Presenting findings and building applications

CASE STUDY: Predicting malicious URLs

Unit-II:

IPython: Beyond Normal Python, Shell or Notebook?, Launching the IPython Shell, Launching the Jupyter Notebook, Help and Documentation in IPython, Accessing Documentation with ?, Accessing Source Code with ??, Exploring Modules with Tab Completion, Keyboard Shortcuts in the IPython Shell, , IPython Magic Commands, Input and Output History, Underscore Shortcuts and Previous Outputs, Suppressing Output, IPython and Shell Commands, Shell Commands in IPython, Passing Values to and from the Shell, Shell-Related Magic Commands, Errors and Debugging, Profiling and Timing Code,

CASE STUDY: Building a recommender system inside a database

Unit-III:

Introduction to NumPy: Data Types in Python, Python List, Fixed-Type Arrays in Python, Creating Arrays from Python Lists, Creating Arrays from Scratch, NumPy Standard Data Types, The Basics of NumPy Arrays, NumPy Array Attributes, Array Indexing: Accessing Single Elements, Array Slicing: Accessing Subarrays, Reshaping of Arrays, Array Concatenation and Splitting, Exploring NumPy's UFuncs, Aggregation functions

CASE STUDY: Assessing risk when loaning money

Unit-IV:

Data Manipulation with Pandas: Installing and Using Pandas, Introducing Pandas Objects, The Pandas Series Object, The Pandas DataFrame Object, The Pandas Index Object, Data Indexing and Selection, Data Selection in DataFrame, Operating on Data in Pandas, Handling Missing Data, Operating on Null Values, Combining Datasets: Concat and Append, Combining Datasets: Merge and Join, Working with Time Series

CASE STUDY: Classifying Reddit Posts

Unit-V:

Visualization with Matplotlib: Importing matplotlib, Setting Styles, Plotting from a script, Plotting from an IPython shell, Plotting from an IPython notebook, Saving Figures to File, Two Interfaces for the Price of One, Simple Line Plots, Adjusting the Plot: Line Colors and Styles, Adjusting the Plot: Axes Limits, Labeling Plots, Simple Scatter Plots, Density and Contour Plots, Histograms, Binnings, and Density, Customizing Matplotlib: Configurations and Stylesheets, Geographic Data with Basemap, Visualization with Seaborn, Other Python Graphics Libraries

Python Libraries for Machine Learning: Introducing Scikit-Learn, Data Representation in Scikit-Learn, Scikit-Learn's Estimator API

Case Study: Exploring Handwritten Digits

Prescribed Text Books:

1. Introducing Data Science: BIG DATA, MACHINE LEARNING, AND MORE, USING PYTHON TOOLS by DAVY CIELEN, ARNO D. B. MEYSMAN, MOHAMED ALI
2. Python Data Science Handbook Essential Tools for Working with Data by Jake Vander Plas
3. R for Data Science Import, Tidy, Transform, Visualize, and Model Data by Hadley Wickham and Garrett Grolemund
4. Data Science using Python and R by C.D Larose and D.T.Larose
5. Mathematical Foundations of Data Science Using R by Frank Emmert-Streib, Salissou Moutari, and Matthias Dehmer

BCA General Honours
III Year V Semester
COURSE 15B: FOUNDATIONS OF DATA SCIENCE

Practical

Credits: 1

2hrs/week

LIST OF EXPERIMENTS:

Course Outcomes: On successful completion of this practical course, student shall be able to:

1. Execute python basic programs.
2. Work with Python IDEs.
3. Gain practical knowledge on different python libraries .

Implement the lab experiments in Python with any real-time example

1. Introduction to programming with Python.
2. Python programming basics
3. Conditional statements
4. Loops
5. Functions
6. Integrated Development Environments (IDEs).
7. How to structure Python code in a project.
8. How to manage libraries in Python using virtual environments.
9. Data Loading, Storage, and File Formats.
10. Data Cleaning and Preparation.
11. Data Manipulation with Pandas.
12. Data Wrangling: Join, Combine, and Reshape.
13. Plotting and Visualization.
14. Data Aggregation and Group Operations.
15. Advanced Numpy.
16. Matplotlib
17. Building and optimizing pipelines in scikit-learn.

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21. Short answer question from Unit-1
22. Short answer question from Unit-1
23. Short answer question from Unit-2
24. Short answer question from Unit-2
25. Short answer question from Unit-3
26. Short answer question from Unit-3
27. Short answer question from Unit-4
28. Short answer question from Unit-4
29. Short answer question from Unit-5
30. Short answer question from Unit-5

SECTION - B

Answer any Five of the following

5 X 12= 60 Marks

31. Long answer question from Unit-1
32. Long answer question from Unit-1
33. Long answer question from Unit-2
34. Long answer question from Unit-2
35. Long answer question from Unit-3
36. Long answer question from Unit-3
37. Long answer question from Unit-4
38. Long answer question from Unit-4
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