Programme: B.Com. Computer Applications (Major)

w.e.f. AY 2025-26

COURSE STRUCTURE

Year	Semester	Course	Title of the Course	No. of Hrs /Week	No. of Credits
III	V	14A	Data Science using Python	3	3
			Data Science using Python Practical Course	2	1
		14B	Cyber Security	3	3
			Cyber Security Practical Course	2	1
		15A	Web application development using Javascript, PHP	3	3
			Web application development using Javascript, PHP Practical Course	2	1
		15B	Block chain Technology	3	3
			Block chain Technology Practical Course	2	1
	VI	Semester Internship/Apprenticeship			12

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

SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 14 A: Data Science using Python
w.e.f 2025-26

Theory Credits: 3 3 hrs/week

Learning Outcomes:

At the end of the course, the student will able to;

- Understanding the basic concepts of Data Science
- Understand why Python is a useful scripting language for developers
- Use standard programming constructs like selection and repetition
- Use aggregated data (list, tuple and dictionary)
- Implement functions and modules

Unit - I

Introduction to Data Science: Data science and its importance, advantages of data science, the process of data science, Responsibilities of a data scientist, qualifications of data scientists, would you be a good data scientist, why to use Python for data science.

Unit - II

Introduction to Python: What is Python, features of Python, history of Python, writing and executing the Python program, basic syntax, variables, keywords, data types, operators, indentation.

Control structures: Conditional statements-if, if-else, nested if-else, looping statements-for, while, break, continue, pass

Unit - III

Strings: definition, accessing, slicing and basic operations

Lists - introduction, accessing list, operations, functions and methods

Tuples - introduction, accessing tuple

Dictionaries - introduction, accessing values in dictionaries

Unit - IV

Functions & Modules: Functions - defining a function, calling a function, types of functions, function arguments, local and global variables, lambda and recursive functions, Modules- math and random

Unit - V

Classes and Objects: Class method and self-argument, class variables and object variables, public and private data members, private methods, built-in class attributes, static methods.

Reference Books:

1. Steven cooper --- Data Science from Scratch, Kindle edition
2. Reema Thareja — Python Programming using problem solving approach, Oxford Publication
3. Dr. R Nageswara Rao – Core Python Programming, DreamTech Press

Online Resources:

https://stackify.com/java-tutorials/
https://www.w3schools.com/java/
https://www.javatpoint.com/java-tutorial
https://www.tutorialspoint.com/java/index.htm

SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 14 A: Data Science using Python Practicals

Practical Credits: 1 2 hrs/week

LIST OF EXPERIMENTS

1. Python Program to Calculate simple and compound interest.
2. Python Program to Swap Two Variables
3. Python Program to Generate a Random Number
4. Python Program to Check if a Number is Odd or Even
5. Python Program to Find the Largest Among Three Numbers
6. Python Program to Check Prime Number
7. Python Program to Display the multiplication Table
8. Python Program to Print the Fibonacci sequence
9. Python Program to Find the Sum of Natural Numbers
10. Python Program to Find Factorial of Number Using Recursion
11. Python Program to work with string methods.
12. Python Program to create a dictionary and print its content.

MODEL QUESTION PAPER
SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 14 A: Object Oriented Programming with JAVA
(w.e.f. 2025-26)

Time :3 Hrs **Max Marks: 75 Marks**

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
B.Com (CA) Honours
III Year V SEMESTER
COURSE 14 B: Cyber Security
(w.e.f. 2025-26)

Theory Credits: 3 3 hrs/week

Course Objectives:
The aim of this course is to help the learner to understand key terms and concepts in cyber security. The Learner will learn to secure clean and corrupted systems, protect personal data, and secure computer networks. The Learner will be able to examine secure software development practices and gain an understanding of cryptography, how it has evolved, and some key encryption techniques used today.

Learning Outcomes: The students will be able to:
Analyze and evaluate the cyber security needs of an organization. Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation. Measure the performance and troubleshoot cyber security systems. Implement cyber security solutions and use of cyber security, information assurance, and cyber / computer forensics software/tools. The Learner will develop an understanding of security policies (such as confidentiality, integrity, and availability) and protocols to implement such policies and will gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.

Unit 1: Cyber Security Fundamentals: Network Security Concepts: Information Assurance Fundamentals, Basics of Cryptography: Symmetric and Asymmetric, DNS, Firewalls, Virtualization, Radio-Frequency Identification Microsoft Windows Security Principles: Windows Tokens, Window Messaging, Windows Program Execution, Windows Firewall
Case Study: Install any Virtualization Software and perform various tasks

Unit 2: Attacker techniques and motivations: Anti forensics, Tunneling Techniques, Fraud Techniques, and Threat Infrastructure
Case Study: Working with Free and commercial proxies available from web-hack.ru.
Unit 3: Exploitation: Techniques to gain a Foothold, Misdirection, Reconnaissance, and Disruption Methods
Case Study: Working with SQL Injection attacks and DDoS attacks
Unit 4: Malicious Code: Self-Replicating Malicious Code, Evading Detection and Elevating Privileges, Stealing Information and Exploitation.
Case Study: Identify latest Malwares and differentiate different types of malwares

Unit 5: Defense and Analysis Techniques: Memory Forensics, Honeypots, Malicious Code Naming, Automated Malicious Code Analysis Systems, Intrusion Detection Systems

Case Study: Identify latest Anti-Virus software in the market and compare the functionality of each Anti-Virus

Text Books:

1. Cyber Security Essentials by James Graham, Richard Howard, Ryan Olson, CRC Press
2. Introduction to Cyber Security by Jeetendra Pandey
3. Cryptography and Network Security by William Stallings

References:

Cyber Security for Beginners by Heimdal® Security - Proactive Cyber Security Software (heimdalsecurity.com)

SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 14 B: Cyber Security

Practical Credits: 1 2 hrs/week

Assignment 1:

1. What is the command used for finding host/domain name and IP address?
2. What is the command will display the assigned IP address of ETHERNET adapter?
3. What is the command used for checking the network connectivity?
4. What is the command used for finding all the ip addresses of a given domain name?
5. What is the command used for finding connection to and from the host?
6. What is the command used to view user information, user's login name, real name terminal name and write status ?
7. What is the command used for mapping name to IP addresses?
8. What is the command used for connecting to a host on a particular port?
9. What is the command used to make a connection to a remote machine and execute programs as if one were physically present ?
10. What are the text based web browsers available through command line?

Assignment 2:

1. What is the command used for downloading a website for off-line view ?
2. What is the command used for displaying or manipulating the ARP (Address Resolution Protocol) information on a network device or computer. ?
3. What is the command used for checking/starting/stopping networking services, users, messaging, configuration and so on...?
4. What is the command a packet filtering configuration program used for manipulating net filter kernel based firewall?
5. What is the command used for showing network statistics?
6. What is the command used for displaying and manipulating routing table ?
7. What is the command used to monitor access control for supported services ?
8. What is the command used to view network traffic?
9. What is the command used to change your hostname ?
10. What is the command used for an interface IP address ?

Assignment 3:

1. What is the command used for controls access to daemons at the application level, rather than at the IP level?
2. What is the command used for connecting to a host with encryption?
3. In what is the file, we can find the local look up server used by the browser. 4. Command used to find out the intermediate nodes between the host and the server is.

5. What is the command used to find out the intermediate domain name nodes between the host and the server?
6. Command used to follow all the information a DNS server has about a particular domain
7. The command get documents/files from or send documents to a server
8. How to check if a particular interface is up and running?
9. This command used to list info about machines that respond to SMB name queries (for example windows based machines sharing their hard disks).
10. This command used to look up the contact information from the "who is" databases, the servers are only likely to hold major sites. Note that contact information is likely to be hidden or restricted as it is often abused by crackers and others looking for a way to cause malicious damage to organizations.
11. It allows you to send and receive files between two computers.
12. Another part of the ssh package. This command similar to ftp but uses an encrypted tunnel to connect to an ftp server and is therefore more secure than just plain ftp.
13. Part of the ssh package. Allows you to copy files from one computer to another computer.
14. nfs - nfsfstab format and options
15. where to look to find out the services What is the are available to the system .
16.where to look to find out the list of protocols What is the are available to the system along with their port numbers .
17. To listing the iptables of your linux system.
18. How to know if a service is running or not.
19. How to Enable IP Forwarding in Linux

Assignment 4:
1. Study of Wireshark Manual.

Assignment 5 :
Perform the following using Wireshark
1. Identify the first 2 packets (i.e. their packet numbers) containing HTTP GET request.
2. What webpage was visited in the above 2 packets?
3. What version of HTTP was used?
4. What is the destination IP address in the above packets?
5. List the source and destination ports of the packets travelling from the client to this server in the above packets?
6. In the HTTP server's response, look at the information sent about the server. What server software was used?
7. What are the IP addresses of the server?

Assignment 6:

Perform the following using Wireshark.

1. What are the MAC addresses of the client and server?
2. How many WebPages (not websites) have been opened?
3. What is the time difference between first HTTP GET and the first HTTP response (OK)?
4. Count the total number of HTTP GET requests.
5. What is the time difference between the first and last HTTP GET requests? Hint: Follow a similar procedure as mentioned previously.
6. How may packets were exchanged between the server (corresponding to the both IP addresses) and the client?

(Note: Their sum must be equal to the total no. of packets)

7. Find the total no. of HTTP requests sent by the host spongebob.wikia.com.

Assignment 7:

1. SQL Injection Implementation and Execution.

Assignment 8:

1. Give a short note on OSSEC?
2. What are the components of OSSEC
3. List the few key features of OSSEC.
4. What are the types of agent in OSSEC?
5. What are the roles of Manager (server) and an Agent in OSSEC?
6. What is Syscheck in OSSEC?
7. What is LIDS and HIDS?

Assignment 9:

1. What is the type of log used by pflogsumm?
2. What is the type of log used by webalizer?
3. What are the different types of logs used by AWStats?
4. Pflogsumm analyzes is a mail/weblog or both?
5. Webalizer analyzes is a mail/weblog or both?
6. Command line option used for increment log analysis, mention domain name and squid log file with webalizer.
7. AWStats tools written in What is the language?

Assignment 10:

1. Steps for setting up Cyber Security in organization.

References for All Assignments:

1. http://www.ossec.net/
2. www.linuxmanpages.com/man1/pflogsumm.1.php
3. www.webalizer.org/
4. http://www.computersecuritystudent.com/SECURITY_TOOLS/DVWA/

MODEL QUESTION PAPER
SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 14 B: Cyber Security
(w.e.f. 2025-26)

Time :3 Hrs **Max Marks: 75 Marks**

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
B.Com (CA) Honours
III Year V SEMESTER
COURSE 15 A: Web Application Development using Javascript, PHP
w.e.f 2025-26

Theory Credits: 3 3 hrs/week

Learning Outcomes:

Students after successful completion of the course will be able to:

1. Write simple programs in PHP.
2. Understand how to use regular expressions, handle exceptions, and validate data using PHP.
3. Apply In-Built 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 a MySQL database and can write data base driven web pages.

Unit – I

Introduction to JavaScript - What is DHTML, JavaScript - basics, variables, statements, operators, conditional statements, arrays, functions, string manipulations, mathematical functions.

Unit – II

HTML DOM: Introduction, Javascript document object: Finding HTML Elements(by ID, by Tag Name, by class Name, by CSS Selectors), Changing HTML Elements, Adding and Deleting Elements.

DHTML with JavaScript: Data validation, regular expressions, exception handling, messages and confirmations.

Unit - III

The Building blocks of PHP: Variables, Data Types, Operators and Expressions, Constants. Control statements in PHP, Creating Arrays, Array-Related Functions.

Working with Objects: Creating Objects, Object Instance, using String, Date and Time Functions in PHP.

Unit - IV

Working with Forms: Creating Forms, Accessing Form Input with get and Post method, Combining HTML and PHP code on a single Page, Working with File Uploads.

Session Function Overview: Starting a Session, Working with session variables, Destroying Sessions and Un-setting Variables.

Unit – V

Interacting with MySQL using PHP: MySQL features, Data types, operators, MySQL vs MySQLi Functions, Connecting to MySQL with PHP, Working with MySQL Data.

Creating Database, creating Tables using PHP, Record Adding Mechanism using PHP, Viewing Records using PHP, Record Deletion Mechanism using PHP.

Reference Books.

1. An Introduction to HTML and JavaScript: for Scientists and Engineers, Davi dR. Brooks. Springer, 2007
2. Robin Nixon, Learning PHP, MySQL, JavaScript, CSS & HTML5, Third Edition O'reilly, 2014.
3. Julie C.Meloni, SAMS Teach yourself PHP MySQL and Apache, Pearson Education(2007).
4. Steven Holzner, PHP: The Complete Reference, McGraw-Hill

Web Resources:

a. http://www.w3schools.com
b. https://www.phptpoint.com

SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 15 A: Web Application Development using Javascript, PHP

Practical Credits: 1 2 hrs/week

1. Write a JavaScript program to Display date and time and greetings of the day
2. Write a JavaScript to calculate average of the given numbers.
3. Write a PHP program to display Fibonacci series.
4. Write a PHP Program to read the employee details.
5. Write a PHP program to prepare the student marks list.
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 PHP script to connect MySQL server from your website.
10. Write a program to keep track of how many times a visitor has loaded the page.
11. Write a PHP application to perform CRUD (Create, Read, Update and Delete) operations on a database table.
12. Create a web site using any open-source framework built on PHP and MySQL – It is a team activity wherein students are divided into multiple groups and each group comes up with their own website with basic features

MODEL QUESTION PAPER
SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 15 A: Web Application Development using Javascript, PHP
(w.e.f. 2025-26)

Time :3 Hrs **Max Marks: 75 Marks**

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
B.Com (CA) Honours
III Year V SEMESTER
COURSE 15 B: Block Chain Technology
w.e.f 2025-26

Theory Credits: 3 3 hrs/week

Course Objectives:
The course aims to help learners to acquire conceptual knowledge of Block Chain Technology. To Understand Security systems in Block Chain Technology. To acquire knowledge to applications of Block Chain Technology.

Learning Outcomes: The students will be able:
Identify various types of Software Architecture and understand types of Cryptography. Improve knowledge in understanding underlying technologies in Block Chain Technologies. Understand the storage methods and advantages and have knowledge on the applications of Block Chain

Unit 1: Layers of a Software System, Integrity, A Payment System, Types of Software Architecture, Purpose of the Blockchain, Peer -to-Peer system: Definition, Architecture, Link between Peer-to-Peer and Blockchain, Integrity Threats in Peer-to-Peer Systems, Four ways of Defining Blockchain, The purpose of the Blockchain, Blockchain Properties
Case Study: Identify Different Crypto Payments and Differentiate Them

Unit 2: Foundations of Ownership, Security Related concepts in Block chain, Purpose and Properties of a Ledger, Double Spending Problem, Designing and Developing a Software System, Documenting Ownership, Integrity of the Transaction History
Case Study: Study about Harbor, Ubitquity, Propy that are used in Real Estate

Unit 3: Hash Function in Block chain, Patterns of Hashing Data, Uses of Hash Values, Cryptography: Activities, Types of Cryptography, Digital Signatures
Case Study: Differentiate between various Blockchain Techniques used in Medical Field such as Ambrosus, Connecting Care, Farma Trust, MedRec

Unit 4: Transforming Book into Blockchain Data structure, Chaining Blocks of Data, Protecting the Data Store, Distributing the Data Store among Peers, Verifying and Adding Transactions
Case Study: How we Apply Blockchain Technology in Elections and Voting

Unit 5: Choosing a transaction History, Paying for Integrity, Technical Limitations of Blockchain, Conflicting Goals of the Blockchain, Characteristics of the Blockchain, Blockchain Applications, Blockchain Platforms
Case Study: Identify various Blockchain Technologies used in Entertainment

Text Books:

1. Blockchain Basics by: A Non-Technical Introduction in 25 Steps by Daniel Drescher, APress
2. Blockchain: Cybrosys Limited Edition

Web References:

1. 10 Blockchain Use Cases in Real Practical World | GoLinuxCloud
2. 33 Top Blockchain Applications to Know for 2023 | Built In
3. 15+ Practical Blockchain Use Cases in 2022 - 101 Blockchains
4. 30+ Real Examples Of Blockchain Technology In Practice (forbes.com)

SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 15 B: Block Chain Technology

Practical Credits: 1 2 hrs/week

LIST OF EXPERIMENTS

1. Creating and Building Up Crypto Token
2. Ethereum Smart Contract
3. Creating and Building Up Bitcoin Wallet
4. Introduction to Hyperledger
5. Creating a Business Network using Hyperledger
6. Creating a Business Network using Hyperledger- II
7. Building and Deploying multichain private Blockchain

MODEL QUESTION PAPER
SRI VENKATESWARA UNIVERSITY::TIRUPATI
B.Com (CA) Honours
III Year V SEMESTER
COURSE 15 B: Block Chain Technology
(w.e.f. 2025-26)

Time :3 Hrs **Max Marks: 75 Marks**

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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