



ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ.

ಜ್ಞಾನ ಗಂಗಾ, ಕಲಬುರಗಿ-585 106, ಕರ್ನಾಟಕ, ಭಾರತ
(ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯಗಳ ಅಧಿನಿಯಮ 1976ರನ್ವಯ 10-19-1989 ರಂದು ಸ್ಥಾಪಿಸಲಾದ ವಿಶ್ವವಿದ್ಯಾಲಯ ಮತ್ತು 2000ರ ಅಧಿನಿಯಮದ ಅಡಿಯಲ್ಲಿ ಬದಲಾಯಿಸಿದಂತೆ)
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ವಿದ್ಯಾಮಂಡಲ



ಕ್ರ.ಸಂ.ಗು.ವಿಕ/ವಿಮವಿ/ಬಿ.ಟಿ.ಎಸ್/2023-24/

ದಿನಾಂಕ:

ಅಧಿಸೂಚನೆ

- ವಿಷಯ: ಸ್ನಾತಕ ಪದವಿ ಬಿ.ಎಸ್ಸಿ ಕೋರ್ಸಿನ ಗಣಕ ವಿಜ್ಞಾನ ಅಧ್ಯಯನ ವಿಷಯದ ಐದನೇ ಹಾಗೂ ಆರನೇ ಸೆಮೆಸ್ಟರ್ ಪಠ್ಯಕ್ರಮ ಅನುಮೋದಿಸಿ 2023-24ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಜಾರಿಗೊಳಿಸಿದ ಬಗ್ಗೆ.
- ಉಲ್ಲೇಖ:1. ಸರ್ಕಾರದ ಆದೇಶ ಸಂಖ್ಯೆ ಇಡಿ 104 ಯುಎನ್‌ಇ 2023 ಬೆಂಗಳೂರು, ದಿನಾಂಕ:20.07.2023
2. ಗಣಕ ವಿಜ್ಞಾನ ವಿಷಯದ ಸ್ನಾತಕ ಅಧ್ಯಯನ ಮಂಡಳಿಯ ನಿರ್ಣಯ ದಿನಾಂಕ: 25.09.2023.
3. ವಿಜ್ಞಾನ ನಿಕಾಯಗಳ ಸಮೀತಿ ಸಭೆಯ ನಿರ್ಣಯ ದಿನಾಂಕ: 06.11.2023.
4. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಅನುಮೋದನೆ ದಿನಾಂಕ: 13.11.2023.

ಸರ್ಕಾರದ ನಿರ್ದೇಶನದಂತೆ, 2023-24ನೇ ಶೈಕ್ಷಣಿಕ ಪ್ರಸಕ್ತ ಸಾಲಿನಿಂದ ಜಾರಿಗೊಳಿಸಿರುವ ಸ್ನಾತಕ ಪದವಿ ಐದನೇ ಮತ್ತು ಆರನೇ ಸೆಮೆಸ್ಟರ್ ಪಠ್ಯಕ್ರಮವನ್ನು ಜಾರಿಗೊಳಿಸಬೇಕಾಗಿರುವ ಪ್ರಯುಕ್ತ ಗಣಕ ವಿಜ್ಞಾನ ಅಧ್ಯಯನ ವಿಷಯದ ಅಧ್ಯಯನ ಮಂಡಳಿಯು ಪಠ್ಯಕ್ರಮವನ್ನು ಪರಿಷ್ಕರಿಸಿ ಶಿಫಾರಸ್ಸು ಮಾಡಿರುವುದರಿಂದ ಸದರಿ ಪಠ್ಯಕ್ರಮವನ್ನು ವಿಜ್ಞಾನ ನಿಕಾಯದ ಸಭೆಯಲ್ಲಿ ಒಪ್ಪಿಗೆ ಪಡೆದಿರುವಂತೆ, ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಘಟನೋತ್ತರ ಅನುಮೋದನೆಯನ್ನು ನಿರೀಕ್ಷಿಸಿ ಸದರಿ ಪಠ್ಯಕ್ರಮವನ್ನು ಪ್ರಸ್ತುತ ಸ್ನಾತಕ ಪದವಿ ಕೋರ್ಸಿನ ಗಣಕ ವಿಜ್ಞಾನ ಅಧ್ಯಯನ ವಿಷಯದ ಐದನೇ ಮತ್ತು ಆರನೇ ಸೆಮೆಸ್ಟರ್ 2023-24ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ ಜಾರಿಗೊಳಿಸಲಾಗಿದೆ.

ಈ ಮಾಹಿತಿಯನ್ನು ಸಂಬಂಧಪಟ್ಟ ಶಿಕ್ಷಕರ ಹಾಗೂ ವಿದ್ಯಾರ್ಥಿಗಳ ಗಮನಕ್ಕೆ ತರಲು ಸೂಚಿಸಲಾಗಿದೆ. ಪಠ್ಯಕ್ರಮದ ವಿವರಗಳನ್ನು ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವೆಬ್‌ಸೈಟ್ www.gug.ac.in ದಿಂದ ಪಡೆಯಬಹುದಾಗಿದೆ.

ಕುಲಸಚಿವರು

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ.

15.11.23

ಗೆ,

- ಮುಖ್ಯಸ್ಥರು, ಗಣಕ ವಿಜ್ಞಾನ ಅಧ್ಯಯನ ವಿಭಾಗ, ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ.
- ಎಲ್ಲಾ ಪದವಿ ಕಾಲೇಜುಗಳ ಪ್ರಾಂಶುಪಾಲರುಗಳಿಗೆ.

ಪ್ರತಿಗಳು:

- ಡೀನ್‌ರು, ವಿಜ್ಞಾನ ನಿಕಾಯ, ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
- ಕುಲಸಚಿವರು (ಮೌಲ್ಯಮಾಪನ) ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ
- ನಿರ್ದೇಶಕರು, ಪಿಎಂಇಬಿ ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
- ಗ್ರಂಥಪಾಲಕರು, ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
- ವಿಜ್ಞಾನ ನಿಕಾಯದ ಎಲ್ಲಾ ಅಧ್ಯಯನ ವಿಭಾಗಗಳ ಮುಖ್ಯಸ್ಥರಿಗೆ ಗು.ವಿ. ಕಲಬುರಗಿ
- ಸಂಯೋಜಕರು, ಟಾಸ್ಕ್‌ಫೋರ್ಸ್ ಸಮಿತಿ, ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
- ವಿಶೇಷಾಧಿಕಾರಿಗಳು, ಆಡಳಿತ, ವಿದ್ಯಾಮಂಡಲ, ಪರೀಕ್ಷಾ, ಅಭಿವೃದ್ಧಿ ಗು.ವಿ. ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.
- ಮುಖ್ಯಸ್ಥರು, ಗಣಕ ಕೇಂದ್ರ, ಗು.ವಿ. ಕಲಬುರಗಿ ರವರಿಗೆ ವೆಬ್‌ಸೈಟ್‌ನಲ್ಲಿ ಪ್ರತ್ಯೇಕ ಪೋರ್ಟಲ್‌ನಲ್ಲಿ ಪ್ರಕಟಿಸಲು ಸೂಚಿಸಲಾಗಿದೆ.
- ನೋಡಲ್ ಅಧಿಕಾರಿಗಳು, UUCMS, ಗು.ವಿ.ಕಲಬುರಗಿ ಇವರ ಮಾಹಿತಿಗಾಗಿ
- ಕುಲಪತಿಗಳ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿ/ಕುಲಸಚಿವರ ಆಪ್ತ ಸಹಾಯಕರ ಗು.ವಿ. ಕಲಬುರಗಿ ರವರ ಮಾಹಿತಿಗಾಗಿ.



GULBARGA UNIVERSITY, KALABURAGI

**DEPARTMENT OF COMPUTER SCIENCE
SYLLABUS FOR BACHELOR OF SCIENCE
WITH COMPUTER SCIENCE AS MAJOR COURSES**

(B.Sc.)

(CBCS SCHEME)

(SYLLABUS WITH EFFECT FROM ACADEMIC YEAR 2023-24 & ONWARDS)

Approved the Syllabus by BOS(UG) on dated 25-09-2023 and Faculty on dated 06-11-2023.

GULBARGA UNIVERSITY

**BACHELOR OF SCIENCE (B.Sc.) CBCS SYLLABUS
(CBCS Scheme)**

(With effect from the academic year 2023-24 and onwards)

Gulbarga University, Kalaburagi
B.Sc. in Computer Science
Effective from 2023-24

Se m.	Course Code	Theory/ Practical	Course Title	Teach ing/Pr actical hours/ Week	Durati on of Exam	Marks			Cred its
						Sum mati ve	For mati ve	Tot al	
V	CSDSC5T	Theory	Programming in Python	04hrs	02 hrs	60	40	100	04
	CSDSC5P	Practical	Python Programming Lab	04 hrs	02 hrs	25	25	50	02
	CSDSC6T	Theory	Computer Networks	04hrs	02 hrs	60	40	100	04
	CSDSC6P	Practical	Computer Networks Lab	04 hrs	02 hrs	25	25	50	02
	*SEC4AT	Theory	Cyber Security	02hrs	02hrs	30	--	30	02
	*SEC4AP	Practical	Cyber Security Lab	02hrs	--	--	20	20	01
	*SEC4BT	Theory	Employability Skills	02hrs	02hrs	30	--	30	02
	*SEC4BP	Practical	Employ ability Skills Lab	02hrs	--	--	20	20	01
VI	CSDSC7T	Theory	Web Technologies	04hrs	02 hrs	60	40	100	04
	CSDSC7P	Practical	Web Technologies Lab	04 hrs	02 hrs	25	25	50	02
	CSDSC8T	Theory	Statistical Computing & R Programming	04hrs	02 hrs	60	40	100	04
	CSDSC8P	Practical	R Programming Lab	04 hrs	02 hrs	25	25	50	02
	* CSINT	Internship /Project	Project		--	--	50	50	02

* The detailed guidelines shall be formulated by the University separately.

Note: Choose any one SEC Paper.

B.Sc. V Semester

Course Code: CSDSC5T	Course Title: Programming in Python
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

Course Outcomes (COs):

At the end of the course, students will be able to:

- Setup python to develop simple applications
- Understand the basic concepts in Python Programming.
- Learn how to write, debug and execute Python programs.
- Understand and demonstrate the use of advanced data types such as Tuples, Dictionaries and Lists, Tuples and Sets.
- Design solutions for problems using object-oriented concepts in Python.
- Use and apply the different Python Libraries for GUI Interface, Data Analysis and Data Visualization.
- Extend the knowledge of python programming to build successful career in software development.

Unit	Description	Hours
1	<p>Introduction to Features and Applications of Python; Python Versions; Installation of Python; Python Command Line mode and Python IDEs; Simple Python Program.</p> <p>Python Basics: Identifiers; Keywords; Statements and Expressions; Variables; Operators; Precedence and Association; Data Types; Indentation; Comments; Built-in Functions- Console Input and Console Output, TypeConversions; Python Libraries; Importing Libraries with Examples.</p> <p>Python Control Flow: Types of Control Flow; Control Flow Statements- if, else, elif, while loop, break, continue statements, for loop Statement; range () and exit () functions.</p>	10
2	<p>Exception Handling: Types of Errors; Exceptions; Exception Handling using try, except and finally.</p> <p>Python Functions: Types of Functions; Function Definition- Syntax, Function Calling, Passing Parameters/arguments, the return statement; Default Parameters; Command line Arguments; Key Word Arguments; Recursive Functions; Scope and Lifetime of Variables in Functions.</p> <p>Strings: Creating and Storing Strings; Accessing Sting Characters; the str() function; Operations on Strings- Concatenation, Comparison, Slicing and Joining, Traversing; Format Specifiers; Escape Sequences; Raw and Unicode Strings; Python String Methods.</p>	10

3	<p>Lists: Creating Lists; Operations on Lists; Built-in Functions on Lists; Implementation of Stacks and Queues using Lists; Nested Lists.</p> <p>Dictionaries: Creating Dictionaries; Operations on Dictionaries; Built-in Functions on Dictionaries; Dictionary Methods; Populating and Traversing Dictionaries.</p> <p>Tuples and Sets: Creating Tuples; Operations on Tuples; Built-in Functions on Tuples; Tuple Methods; Creating Sets; Operations on Sets; Built-in Functions on Sets; Set Methods.</p>	10
4	<p>File Handling: File Types; Operations on Files– Create, Open, Read, Write, Close Files; File Names and Paths; Format Operator.</p> <p>Object Oriented Programming: Classes and Objects; Creating Classes and Objects; Constructor Method; Classes with Multiple Objects; Objects as Arguments; Objects as Return Values; Inheritance- Single and Multiple Inheritance, Multilevel and Multipath Inheritance; Encapsulation- Definition, Private Instance Variables; Polymorphism- Definition, Operator Overloading.</p>	10
5	<p>GU Interface: The Tkinter Module; Window and Widgets; Layout Management- pack, grid and place.</p> <p>Python SQLite: The SQLite3 module; SQLite Methods- connect, cursor, execute, close; Connect to Database; Create Table; Operations on Tables- Insert, Select, Update, Delete and Drop Records.</p> <p>Data Analysis: NumPy- Introduction to NumPy, Array Creation using NumPy, Operations on Arrays; Pandas- Introduction to Pandas, Series and DataFrames, Creating DataFrames from Excel Sheet and .csv file, Dictionary and Tuples. Operations on DataFrames.</p> <p>Data Visualisation: Introduction to Data Visualisation; Matplotlib Library; Different Types of Charts using Pyplot- Line chart, Bar chart and Histogram and Pie chart.</p>	12

References:

1. Think Python How to Think Like a Computer Scientist, Allen Downey et al., 2nd Edition, 2015, Green Tea Press. Freely available online@ <https://www.greenteapress.com/thinkpython/thinkCSPy.pdf>
2. Introduction to Python Programming, Gowrishankar S et al., 2019, CRC Press.
3. Python Data Analytics: Data Analysis and Science Using Pandas, matplotlib, and the Python Programming Language, Fabio Nelli, 2015, Apress®.
4. Advance Core Python Programming, Meenu Kohli, 2021, BPB Publications.
5. Core PYTHON Applications Programming, Wesley J. Chun, 3rd Edition, 2012, Prentice Hall.
6. Automate the Boring Stuff, Al Sweigart, 2015, No Starch Press, Inc.
7. Data Structures and Program Design Using Python, D Malhotra et al., 2021, Mercury Learning and Information LLC.
8. <http://www.ibiblio.org/g2swap/byteofpython/read/>
9. <https://docs.python.org/3/tutorial/index.html>

Course Code: CSDSC5P	Course Title: Python Programming Lab
Course Credits: 02	Hour of Practical/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks:25	Exam Duration: 02

Practicals:

Part-A

1. Check if a number belongs to the Fibonacci Sequence.
2. Solve Quadratic Equations.
3. Find the sum of n natural numbers.
4. Display Multiplication Tables.
5. Check if a given number is a Prime Number or not.
6. Implement a sequential search.
7. Create a calculator program.
8. Explore string functions.
9. Implement Selection Sort.
10. Implement Stack.
11. Read and write into a file.

Part-B

1. Demonstrate usage of basic regular expression.
2. Demonstrate use of advanced regular expressions for data validation.
3. Demonstrate use of List.
4. Demonstrate use of Dictionaries.
5. Create SQLite Database and Perform Operations on Tables.
6. Create a GUI using Tkinter module.
7. Demonstrate Exceptions in Python.
8. Drawing Line chart and Bar chart using Matplotlib.
9. Drawing Histogram and Pie chart using Matplotlib.
10. Create Array using NumPy and Perform Operations on Array.
11. Create Data Frame from Excel sheet using Pandas and Perform Operations on Data Frames.

References:

1. Think Python How to Think Like a Computer Scientist, Allen Downey et al., 2nd Edition, 2015, GreenTea Press. Freely available online @ <https://www.greenteapress.com/thinkpython/thinkCSPy.pdf>
2. Introduction to Python Programming, Gowrishankar S et al., 2019, CRC Press.
3. Python Data Analytics: Data Analysis and Science Using Pandas, matplotlib, and the Python Programming Language, Fabio Nelli, 2015, Apress®.
4. Advance Core Python Programming, Meenu Kohli, 2021, BPB Publications.
5. Core PYTHON Applications Programming, Wesley J. Chun, 3rd Edition, 2012, Prentice Hall.
6. Automate the Boring Stuff, Al Sweigart, 2015, No Starch Press, Inc.
7. Data Structures and Program Design Using Python, D Malhotra et al., 2021,

Course Code: CSDSC6T	Course Title: Computer Networks
Course Credits: 04	Hour of Teaching/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 40
Exam Marks: 60	Exam Duration: 02 Hours

Course Outcomes (Cos):

At the end of the course, students will be able to:

- Identify the different types of network topologies and Switching methods.
- Describe various Data link Layer Protocols.
- Identify the different types of network devices and their functions within a network.
- Analyze and Interpret various Data Link Layer and Transport Layer protocols.
- Explain different application layer protocols.

Unit	Description	Hours
1	Introduction: Computer Network: Definition, Goals, Structure; Broadcast and Point-To-Point Networks; Network Topology and their various Types; Types of Network, Network software, Design issues for the layers, Connection-oriented vs. Connectionless service, Applications of Computer network, Protocols and Standards, The OSI Reference Model, The TCP/IP Protocol suite, Comparison between OSI and TCP/IP Reference model.	10
2	Physical Layer: Functions of Physical Layer, Analog signals, Digital signals, Transmission Impairment, Data Rate Limits, and Performance. Data Transmission Media: Guided Transmission Media, Magnetic Media, Twisted Pairs, Coaxial Cable, Power Lines, Fiber Optics, Wireless Transmission, Electromagnetic Spectrum, Radio Transmission, Microwave Transmission, Infrared Transmission, Light Transmission, Digital Modulation and Multiplexing, Public Switched Telephone Networks. Switching: Circuit switching, Message switching & Packet switching.	10
3	Data Link Layer: Functions of Data Link Layer, Data Link Control: Framing, Flow and Error Control, Error Detection and Correction, High-Level Data Link Control (HDLC) & point — to — Point protocol(PPP), Channel Allocation Problem, Multiple Access: Radom Access(ALOHA, CSMA, CSMA/CD, CSMA/CA), Controlled Access(Reservation, Polling, Token Passing), Channelization(FDMA, TDMA, CDMA).	10
4	Wired LAN: Ethernet Standards and FDDI, Wireless LAN: IEEE 802.11x and Bluetooth Standards. Transport Layer: Functions of Transport Layer, Elements of Transport Protocols: Addressing, Establishing and Releasing Connection, Flow Control & Buffering, Error Control, Multiplexing & De-multiplexing, Crash Recovery.	10

5	<p>User Datagram Protocol (UDP): User Datagram, UDP Operations, Uses of UDP, RPC, Principles of Reliable Data Transfer: Building a Reliable Data Transfer Protocol, Pipelined Reliable Data Transfer Protocol, Go Back-N (GBN), Selective Repeat (SR).</p> <p>Application layer : Functions of Application layer, Application Layer Protocols: DNS, DHCP, WWW, HTTP, HTTPS, TELNET, FTP, SMTP, POP, IMAP</p>	12
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References:

1. Andrew S Tanenbaum, David. J. Wetherall, -Computer NetworksI, Pearson Education, 5th Edition,
2. Behrouz A. Forouzan, "Data Communications and Networking", Tata McGraw-Hill, Fourth Edition
3. Kurose and Ross, Computer Networking- A Top-Down approach, Pearson, 5th edition
4. William Stallings, Data and Computer Communications, 7th Edition, PHI.
5. <http://highereducation.com/sites/0072967757/index.html>
6. Larry L. Peterson, Bruce S. Davie, -Computer Networks: A Systems Approach, Morgan Kaufmann Publishers, Fifth Edition, 2011.
7. Brijendrasingh, Data Communication and Computer Networks, PHI.

Course Code: CSDSC6P	Course Title: Computer Network Lab
Course Credits: 02	Hour of Practical/Week: 04
Total Contact Hours: 52	Formative Assessment Marks: 25
Exam Marks:25	Exam Duration: 02

Practicals

Part A:

1. Prepare hardware and software specification for basic computer system and Networking.
2. Study of different types of Network cables and practically implement the cross-wired cable and straight through cable using clamping tool.
3. Identifying the networking devices on a network.
4. Configure the IP address of the computer.
5. Create a basic network and share file and folders.
6. Study of basic network command and Network configuration commands.
7. Installation process of any open source network simulation software.
8. Prepare LAN WAN Network Module Local Computers

Part B:

1. Implement connecting two nodes using network simulator.
2. Implement connecting three nodes considering one node as a central node using network simulator. Implement a network to connect three nodes considering one node as a central node using network simulator
3. Implement bus topology using network simulator.
4. Implement star topology using network simulator.
5. Implement ring topology using network simulator.
6. Demonstrate the use of wireless LAN using network simulator.
7. Implement FTP using TCP bulk transfer using network simulator.
8. Implement connecting multiple routers and nodes and building a Hybrid topology network simulator.

Links for open source simulation software:

1. NS3 software: <https://www.nsnam.org/releases/ns-3-30/download/>
2. Packet Tracer Software: <https://www.netacad.com/courses/packet-tracer>
3. GNS3 software: <https://www.gns3.com/>

Course Code: SEC4AT	Course Title: Cyber Security
Course Credits: 03 (2T+1P)	Hour of Teaching/Week: 02 Hr Theory & 02Hrs Practical
Total Contact Hours:30 Hrs	Practical Formative Assessment Marks: 20
Exam Marks: 30	Exam Duration: 02 Hrs

Course Outcomes (COs):

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

- After completion of this course, students would be able to understand the concept of Cyber security and issues and challenges associated with it.
- Students, at the end of this course, should be able to understand the cyber crimes, their nature, legal remedies and as how to report the crimes through available platforms and procedures.
- On completion of this course, students should be able to appreciate various privacy and security concerns on online Social media and understand the reporting procedure of inappropriate content, underlying legal aspects and best practices for the use of Social media platforms.

Unit	Description	Hours
1	Introduction to Cyber security: Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.	10
2	Cyber crime and Cyber law: Classification of cyber crimes, Common cyber crimes- cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus-operandi, Reporting of cyber crimes, Remedial and mitigation measures, Legal perspective of cyber crime, IT Act 2000 and its amendments, Cyber crime and offences, Organisations dealing with Cyber crime and Cyber security in India, Case studies.	10
3	Social Media Overview and Security: Introduction to Social networks. Types of Social media, Social media platforms, Social media monitoring, Hashtag, Viral content, Social media marketing, Social media privacy, Challenges, opportunities and pitfalls in online social network, Security issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media, Case studies.	10

References:

- 1) Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010
- 2) Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
- 3) Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November,2001)

- 4) Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
- 5) Fundamentals of Network Security by E. Maiwald, McGraw Hill.
- 6) Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.

Note: SEC4AP Cyber Security Lab/Activities based on SEC 4AT

Course Code: SEC4BT	Course Title: Employability Skills
Course Credits: 03 (2T+1P)	Hour of Teaching/Week: 02 Hr Theory & 02Hrs Practical
Total Contact Hours:30 Hrs	Practical Formative Assessment Marks: 20
Exam Marks:30	Exam Duration: 02 Hrs

Pedagogy: Classroom lectures, Activities based learning, Practice Questions, Tutorial Classes, Group discussions, Mock Tests, etc,

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

- a) Develop systematic problem-solving abilities.
- b) Enhance verbal and non-verbal reasoning skills.
- c) Improve numerical and analytical abilities.
- d) Enhance English language and communication skills.

Unit	Description	Hours
1	General Orientation on all Competitive Exams: Overview of Competitive Exams for Government Recruitment in India - Introduction, Eligibility Criteria, Exam Pattern, Syllabus, and Resources.	03
2	Quantitative Aptitude: Number system, HCF & LCM, Ratio and Proportion, Averages, Ages, Percentages, Partnerships, Time, Speed and Distance, Profit and Loss, Data Interpretation, Problems based on Simple interest, Compound interest, Clocks, and Calendars.	10
3	Verbal and Nonverbal Reasoning: Verbal Reasoning: Data analysis, Data sufficiency, Decision making, coding & decoding, Blood relations, Puzzle tests, Direction sense test, Problems based on Venn Diagram/Syllogisms, Alphabet test, Arithmetical reasoning, Input/Output, Series and Seating arrangements. Non-Verbal Reasoning: Analogy, Water images, mirror images, embedded figures, Completion of Pattern, Paper folding, Cubes & dice, Figure Formation & Analysis.	10
4	English Language and Comprehension Solving: Vocabulary, English Grammar, Verbal Ability, Sentence Structure, Spot the Error, Fill in the Blanks, Idioms & Phrases, Cloze Passages, and Comprehension Passages.	07

Skill Development Activities:

Various activity-based learning methods such as problem-solving exercises, case studies, role-playing, debates, group discussions, mock tests, and assessments can be conducted, in addition to any other relevant activities for the course to ensure effective learning.

References:

1. R.S Aggarwal- A Modern Approach to Verbal and Non Verbal Reasoning, Sultan Chand and Sons, New Delhi.
2. <https://free.aicte-india.org/Quantitative-Aptitude-Basics.php>
3. https://onlinecourses.nptel.ac.in/noc20_hs19/preview
4. <https://www.udemy.com/course/reasoning-verbal-non-verbal/>

Note: Latest editions of books such as Quantitative Aptitude for Competitive Examinations, Modern Approach to Verbal and Non-Verbal Reasoning, Quick Learning Objective General English by R.S.Agarwal or Arihant Publications, and other renowned titles can be referred to enhance exam preparation.

Note: SEC4BP Employability Skills Lab/ Activities based on SEC 4BT