



Chhattisgarh Swami Vivekanand Technical University (CSVTVU, NEWAI (C.G.))

SCHEME OF TEACHING AND EXAMINATION

B Tech (Eight Semester – Computer Science Engineering)

Sl.No.	Board of Studies (BOS)	Courses (Subject)	Course Code	Period per Week			Scheme of Examination			Total Mark	Credit
				L	T	P	Theory/Lab				
							ESE	CT	TA		
1.	Computer Science Engineering	Cyber Law and Intellectual Property	D022811(022)	3	1	-	100	20	30	150	4
2.	Professional Elective–IV (Refer to Table I)			2	1	-	100	20	30	150	3
3.	Open Elective–III (Refer to Table I)			2	0	-	100	20	30	150	2
6.	Computer Science Engineering	Computer Vision Laboratory	D022821(022)	-	-	2	40	-	20	60	1
7.	Computer Science Engineering	R Programming Laboratory	D022822(022)	-	-	2	40	-	20	60	1
8.	Computer Science Engineering	Project (Phase-II)	D022823(022)	-	-	14	350	-	80	430	7
Total Marks				7	2	18	730	60	210	1000	18

L – Lecturer, T – Tutorial, P – Practical, CT –Class Test ESE – End Semester Exam TA – Teacher’s Assessment

Table I (Professional Elective–IV)

S.N.	Board of Studies	Course Code	Subject
1	Computer Science Engineering	D022831(022)	Introduction to Game Theory
2	Computer Science Engineering	D022832(022)	R Programming
3	Computer Science Engineering	D022833(022)	Multimedia & Computer Vision
4	Computer Science Engineering	D022833(022)	Augmented & Virtual Reality

- Note:** (1) 1/4 th of total strength of students subject to minimum of 20 students is required to offer and elective in the college in a particular academic session.
 (2) Choice of elective course once made for an examination cannot be changed in future Examinations.

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Program / Semester: B.Tech (VIII Sem)	Branch: Computer Science & Engineering
Subject: Cyber Law and Intellectual Property	Course Code: D022811(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 3 T: 1 P: 0 Credits: 4
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

Course Objectives:

1. To make attentive to students about different cybercrimes
2. To understand key terms and concepts in cybercrimes and cyber law
3. To make attentive to students about security privacy and challenges
4. To make attentive to students about copyright and Patents

UNIT-I: Introduction to cybercrimes

Definition, cybercrime and information security, classes of cybercrime and categories, cyber offences, cybercrimes with mobile and wireless devices, cybercrime against women and children, financial frauds, social engineering attacks.

UNIT-II: Cybercrime and Cyber law

Malware and ransom ware attacks, zero day and zero click attacks, Legal perspective of cybercrime, IT Act 2000 and its amendments, Cybercrime and offences, Organizations dealing with Cybercrime and Cyber security in India, Case studies

UNIT-III: Social Media Overview and Security

Introduction to Social networks. Types of Social media, Social media platforms, Social media monitoring, Hash tag, 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.

UNIT-IV: Introduction to Intellectual Property Rights (IPR)

Introduction to IPR, International Instruments and IPR, WIPO – TRIPS – WTO -Laws Relating to IPR , IPR Tool Kit : Protection and Regulation, Copyrights and Neighboring Rights, Agencies for IPR Registration, Emerging Areas of IPR, Use and Misuse of Intellectual Property Rights.

UNIT-V: Patents

Introduction to Patents, Laws Relating to Patents in India, Patent Requirements, Product Patent and Process Patent, Patent Search, Patent Registration and Granting of Patent, Exclusive Rights and Limitations, Ownership and Transfer, Revocation of Patent, Patent Appellate Board, Infringement of Patent, Compulsory Licensing, Patent Cooperation Treaty, New developments in Patents, Software Protection and Computer related Innovations.

Text Books:

1. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
2. Cyber Laws: Intellectual property & E Commerce Security, Kumar K. Dominant Publisher
3. Intellectual Property Rights (Patents & Cyber Law), Dr. A. Srinivas. Oxford University Press, New Delhi.

Reference Books:

1. Cyber Law Text & Cases, Gerald R.Ferrera, Margo E.K. Reder, CENGAGELEARNING Publication.
2. Intellectual Property (Trade Marks and the Emerging concepts of Cyber property rights (HB)”, P. Narayanan, 3rd Edition. (HB), 2002, Universal Book Traders.

Course Outcomes [After undergoing the course, students will be able to:]

1. Understand the cyber security threat landscape.
2. Understand Cyber crimes and cyber laws.
3. Understand various privacy and security concerns on online Social media its legal aspects and best practices.
4. Understand the importance and applications of IPR its regulations.
5. Understand the application process of patent file and other related aspects such as search, registration and grant.

Chhattisgarh Swami Vivekananda Technical University, Bhilai (C.G.)

Program / Semester: B.Tech (VIII)	Branch: Computer Science & Engineering
Subject: R Programming	Course Code: D022832(022)
Total / Minimum-Pass Marks (End Semester Exam): 100 / 35	L: 2 T: 1 P: 0 Credits: 3
Class Tests & Assignments to be conducted: 2 each	Duration (End Semester Exam): 03 Hours

Course Objectives:

1. Learn Fundamentals of R.
2. Covers how to use different functions in R, how to read data into R, accessing R packages, writing R functions, debugging, and organizing data using R functions.
3. Cover the Basics of statistical data analysis with examples.
4. The whole syllabus will give an idea to collect, compile and visualize data using statistical functions.

UNIT-I Introduction to R: What is R? – Why R? – Advantages of R over Other Programming Languages - R Studio: R command Prompt, R script file, comments – Handling Packages in R: Installing a R Package, Few commands to get started: installed, packages(), package Description(), help(), find, package(), library() - Input and Output – Entering Data from keyboard – Printing fewer digits or more digits – Special Values functions : NA, Inf and -inf.

UNIT-II R Data Types: Vectors, Lists, Matrices, Arrays, Factors, Data Frame – R - Variables: Variable assignment, Data types of Variable, Finding Variable ls(), Deleting Variables - R Operators: Arithmetic Operators, Relational Operators, Logical Operator, Assignment Operators, Miscellaneous Operators - R Decision Making: if statement, if – else statement, if – else if statement, switch statement – R Loops: repeat loop, while loop, for loop - Loop control statement: break statement, next statement.

UNIT-III R-Function : function definition, Built in functions: mean(), paste(), sum(), min(), max(), seq(), user-defined function, calling a function, calling a function without an argument, calling a function with argument values - R-Strings – Manipulating Text in Data: substr(), strsplit(), paste(), grep(), toupper(), tolower() - R Vectors – Sequence vector, rep function, vector access, vector names, vector math, vector recycling, vector element sorting –

UNIT-IV R List - Creating a List, List Tags and Values, Add/Delete Element to or from a List, Size of List, Merging Lists, Converting List to Vector - R Matrices – Accessing Elements of a Matrix, Matrix Computations: Addition, subtraction, Multiplication and Division- R Arrays: Naming Columns and Rows, Accessing Array Elements, Manipulating Array Elements, Calculation Across Array Elements - R Factors –creating factors, generating factor levels gl().

UNIT-V Data Frames –Create Data Frame, Data Frame Access, Understanding Data in Data Frames: dim(), nrow(), ncol(), str(), Summary(), names(), head(), tail(), edit() functions - Extract Data from Data Frame, Expand Data Frame: Add Column, Add Row - Joining columns and rows in a Data frame rbind() and cbind() – Merging Data frames merge() – Melting and Casting data melt(), cast(). Loading and handling Data in R: Getting and Setting the Working Directory – getwd(), setwd(), dir() - R-CSV Files - Input as a CSV file, Reading a CSV File, Analyzing the CSV File: summary(), min(), max(), range(), mean(), median(), apply() - Writing into a CSV File – R -Excel File – Reading the Excel file.

Reference Books:

1. Sandip Rakshit, R Programming for Beginners, McGraw Hill Education (India), 2017, ISBN : 978-93-5260-455-5.
2. Seema Acharya, Data Analytics using R, McGrawHill Education (India), 2018, ISBN: 978-93-5260-524-8.
3. Tutorials Point (I) simply easy learning, Online Tutorial Library (2018), R Programming, Retrieved from https://www.tutorialspoint.com/r/r_tutorial.pdf.
4. Andrie de Vries, Joris Meys, R for Dummies A Wiley Brand, 2nd Edition, John Wiley and Sons, Inc, 2015, ISBN: 978-1-119-05580-8

Course Outcomes [After undergoing the course, students will be able to:]

1. Understand the basics of Fundamentals of R.
2. Understands the loading, retrieval techniques of data.
3. Understand how data is analysed and visualized using statistic functions.

Chhattisgarh Swami Vivekanand Technical University, Bhilai

Name of Program:	Bachelor of Technology.		
Branch:	Common to all Branches	Semester:	VIII
Subject:	Blockchain	Code:	D000818(022)
Total Theory Periods:	40	Total Tutorial Periods:	Ten (Minimum)
Class Tests:	Two (Minimum)	Assignments:	2 (Minimum)
ESE Duration:	Three Hours	Min Marks: 100	Min Marks: 35

Course Objectives: The student should be made to:

1. The basics of cryptography used in Blockchain
2. Explain design principles of Blockchain.
3. Explain consensus algorithm used in distributed systems.
4. Explain the basic building blocks of Blockchain.
5. Explains the Blockchain system by sending and reading transactions.
6. Design, build, and deploy a distributed application.
7. Different real-life applications of Blockchain.

UNIT I	Introduction to Blockchain: Need for Distributed Record Keeping, Blockchain architecture, blockheader detailed design, Abstract Models for Blockchain, Proof of Work (PoW), liveness and fairness, Proof of Stake (PoS) based Chains, Hybrid models (PoW + PoS); Types of Blockchain..
UNIT II	Blockchain Consensus: Blockchain Consensus Algorithm challenges and solutions, Modeling faults and adversaries, Byzantine Models of Fault tolerance; Zero Knowledge proofs and protocols in Blockchain
UNIT III	Introduction to cryptographic basics for cryptocurrency: A short description of Hashing, digital signature schemes, encryption schemes and elliptic curve cryptography, verifiable random functions.
UNIT IV	Blockchain 2.0: Introduction to Ethereum, Ethereum Virtual Machine (EVM), Wallets for Ethereum, Solidity, Smart Contracts, Attacks on smart contracts, The Turing Completeness of Smart Contract Languages and verification challenges. Blockchain 3.0: Hyperledger implementation on Ethereum, the plug and play platform and mechanisms in permissioned blockchain.
UNIT V	Application of Blockchain: Bitcoin: Bitcoin consensus, Wallet, Bitcoin Blocks, Merkle Tree, hardness of mining, transaction verifiability, anonymity, forks, double spending, mathematical analysis of properties of Bitcoin. Altcoins. Medical record management systems.

Text Books

1. Josh Thompson, 'Blockchain: The Blockchain for Beginnings, Guide to Blockchain Technology and Blockchain Programming', Create Space Independent Publishing Platform, 2017.
2. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder, 'Bitcoin and cryptocurrency technologies: a comprehensive introduction', Princeton University Press, 2016.
3. Kumar Saurabh, Ashutosh Saxena, 'Blockchain Technology: Concepts and Applications', Wiley, 2020
4. Dr. Sumit Kumar Mishra, Dr. Siddhartha Choubey , Dr. P. John Augustine, Mr. Mrutyunjaya S Yalawar , ' BLOCKCHAIN TECHNOLOGY' SIPH 2022.

Course Outcomes:

At the end of the course, the student should be able to:

1. Understand the basic technology used in Blockchain
2. Understand the working principle of Blockchain systems (mainly Bit coin and Ethereum).
3. Able to understand and design any application specific consensus algorithm
4. Design, build and deploy Smart Contracts and distributed applications,
5. integrating the Blockchain technology into their own applications/ projects

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Program / Semester: B.Tech (VIII)	Branch: Computer Science & Engineering
Subject: Computer Vision Laboratory	Course Code: D022821(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credits: 1

Course Objectives

1. To be able to use Python for Image handling and processing.
2. To perform Geometric transformations and computer homography matrix in Python.
3. To be able to perform perspective transformation, edge detection, line detection and corner detection.
4. To be able to implement SIFT, SURF and HOG in Python.

Write programs to perform following activities:

1. Perform basic Image Handling and Processing operations on the image.
2. Geometric Transformation
3. Compute Homography Matrix
4. Perspective Transformation
5. Camera Calibration
6. Compute Fundamental Matrix
7. Edge Detection, Line Detection and Corner Detection
8. SIFT Feature descriptor
9. SURF and HOG feature descriptor
10. Project based on Computer Vision Applications.

Recommended Books:

1. Programming Computer Vision with Python, Jan Erik Solem, O'Reilly Media, ISBN: 9781449316549 .
2. Practical Machine Learning for Computer Vision: End-to-End Machine Learning for Images, Valliappa Lakshmanan, O'Reilly Media, ISBN: 9391043836.

Course Outcomes [After undergoing the course, students will be able to:]

1. Apply Python for Image handling and processing.
2. Apply Python for Geometric transformations and computer homography matrix.
3. Apply Python for perspective transformation, edge detection, line detection and corner detection.
4. Apply Python for SIFT, SURF and HOG.

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Program / Semester: B.Tech (VIII)	Branch: Computer Science & Engineering
Subject: R Programming Laboratory	Course Code: D022822(022)
Total / Minimum-Pass Marks (End Semester Exam): 40 / 20	L: 0 T: 0 P: 2 Credits: 1

Course Objectives:

1. Demonstrate use of basic functions
 2. Create their own customized functions
 3. Construct tables and figures for descriptive statistics
 4. Learn to understand new data sets and functions by yourself
 5. Work on built in real time cases for analysis and visualization
 6. Enable to build programming logic and thereby developing skills in Programming
 7. Clear understanding on how to organize data and analyze data using real time examples
- LEARNING OUTCOMES:**
1. Write a program to check whether a year (integer) entered by the user is a leap year or not?
 2. Write an R program to find the sum of natural numbers without formula using the if-else statement and the while loop.
 3. Write a program that prints the grades of the students according to the marks obtained. The grading of the marks should be as follows. Marks Grades 800-1000 A+ 700 – 800 A 500 – 700 B+ 400-500 B 150 – 400 C Less than 150 D
 4. Write an R program to make a simple calculator that can add, subtract, multiply and divide using switch cases and functions.
 5. Write a program to perform searching within a list (1 to 50). If the number is found in the list, print that the search is successful otherwise print that the number is not in the list.
 6. Create a list and data frame that stores the marks of any three subjects for 10 students. Find out the total marks, average, maximum marks and minimum marks of every subject.
 7. Write the steps to import data from Excel to CSV files and apply data viewer functions like rm(), dim(), head(), tail(), sorting, filtering, searching to view few set of rows.
 8. Write a program to create two 3 X 3 matrices A and B and perform the following operations a) Transpose of the matrix b) addition c) subtraction.
 9. Write an R program to create a list containing strings, numbers, vectors and logical values and do the following manipulations over the list.
 - a. Access the first element in the list
 - b. Give the names to the elements in the list
 - c. Add element at some position in the list
 - d. Remove the element
 - e. Print the fourth element
 - f. Update the third element
 10. Let us use the built-in dataset air quality which has Daily air quality measurements in New York, May to September 1973. Create a histogram by using appropriate arguments for the following statements.
 - a. Assigning names, using the air quality data set.
 - b. Change colors of the Histogram
 - c. Remove Axis and Add labels to Histogram
 - d. Change Axis limits of a Histogram
 - e. Create a Histogram with density and Add Density curve to the histogram
 11. Design a data frame in R for storing about 20 employee details. Create a CSV file named "input.csv" that defines all the required information about the employee such as id, name, salary, start_date, dept. Import into R and do the following analysis.
 - a. Find the total number rows & columns
 - b. Find the maximum salary
 - c. Retrieve the details of the employee with maximum salary
 - d. Retrieve all the employees working in the IT Department
 - e. Retrieve the employees in the IT Department whose salary is greater than 20000 and write these details into another file "output.csv".
 12. Create a dataset or table ["Smart Phone"] in an excel sheet that stores the mobile information [price, company name, model, SalePercent] of five different companies. Store at least 20 rows. Write the scripts and find out the output for the following information.
 - a. Maximum price of the mobile of each company
 - b. Minimum price of mobile of each company
 - c. Average price of mobile of each company
 - d. Total Price of mobile of each company

Chhattisgarh Swami Vivekananda Technical University, Bhilai

Program / Semester: B.Tech (VII)	Branch: Computer Science & Engineering
Subject: Major Project (Phase II)	Course Code: D022823(022)
Total/Minimum-Pass Marks (End Semester Exam): 350/175	L: 0 T: 0 P: 14 Credits: 7

Guideline for Allocation of project:

1. Information regarding broad area must be made available to the students well in advance (may be during previous semester).
2. Information must cover following parameters.
 - I. Broad area: Subject or expertise/application area.
 - II. Required skills: Knowledge of subject(s), software, tools & other characteristics.
 - III. Type of project: Hardware, software, design, survey, study based etc.
 - IV. Guide available: Name of Guide (S) from Department & Institute.
 - V. Other related information depending upon specific branch & institute.
3. It is also recommended to give proper counseling to pick up suitable project.
4. Students must get chance to select projects as per their choice or decided mutually between students and department faculty (HoD) concern.
5. One project group must contain maximum four students, however students can do project individually but it should be approved by department.
6. Compiled list of projects must be submitted to the University within 25 days of start of semester.
7. Compiled list may contain following parameters.

Monitoring of project:

1. It is recommended to give projects as per the specializations of existing faculty of the department instead of outside person/agency.
2. Project must be allocated, developed and monitored by department / institution itself, but not by outside agencies.
3. Regular review by guide is recommended to ensure development & contribution of students.

Internal Evaluation & Submission of project:

1. Evaluation of project would be as per the examination scheme of the University, which is based on internal as well as external evaluation.
2. Internal assessment requires submission of project report for getting approved by the concern authority. However printing and binding would be as per the conventional format.
3. Evaluation will be based on live demonstration / presentation and Viva.
4. Final submission of project is expected as,
 - Submission of a copy to the University,
 - One copy to the Institution central library,
 - One copy to the department.

External Evaluation:

External assessment of project would be like conduction of practical exams of University, and must be executed as per the norms of practical exams.

NOTE: Completion of Project outside the department/Institution should not be encouraged.