



Board of Studies in Computer Science
Curriculum Structure and Syllabus for V and VI Semesters

Bachelor of Science (BSc)
Choice Based Credit System

CP

~~NB~~ Ep 2.1



2026 - 27 onwards





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2.	Dr. Kusuma Kumari B.M Associate Professor Department of Studies and Research in Computer Applications, Tumkur University, Tumakuru	Member
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6.	Dr. Girija D.K Associate Professor Department of Computer Science Government First Grade College, Koratagere	Member
7.	Dr. Nagaraju K V. Associate Professor Department of Computer Science Government First Grade College for Womens, Tumkur.	Member

Special Thanks to:

1.	Capt. Ramalinga Reddy S Assistant Professor Department of Computer Science Sri Siddaganga Arts and Commerce Evening College Tumkur.
2.	Dr. Haridas S. Associate Professor Department of Computer Science Government First Grade College, Tumkur.
3.	Dr. Husna Sultana Associate Professor Department of Computer Science Government First Grade College, Tumkur.
4.	Dr. Prakash B.R Assistant Professor and HOD Department of Computer Science Government First Grade College, Tipatur.
5.	Sri. Mohan Kumar N Assistant Professor and HOD Department of Computer Science Y.E.R Government First Grade College, Pavagada.
6.	Dr. Manjunath S Assistant Professor, Department of Computer Science Y.E.R Government First Grade College, Pavagada.
7.	Kiran Kumar M Assistant Professor Department of Computer Science Government First Grade College, Tipatur.
8.	Mujtaba Farheen Assistant Professor Department of Computer Science Government First Grade College, Madhugiri.
9.	Harikumar M E Assistant Professor Department of Computer Science Government First Grade College, Madhugiri

Internal Assessment Marks for Theory and Practical

Internal Assessment Marks Allotment for Theory	
Internal Test 1	05
Internal Test 2	05
Assignment	05
Seminar/Quiz	05
TOTAL	20

Internal Assessment Marks Allotment for Practical	
Internal Test	05
Record and Attendance	05
TOTAL	10

Internal Assessment Marks Allotment for V Semester SEC Papers	
Internal Test 1	05
Internal Test 2	
Assignment	02
Seminar/Quiz	03
TOTAL	10

Evaluation Scheme for Lab Examination

Assessment Criteria	
Writing 2 Programs	10
Execution of 2 Programs	20
Viva	10
Total	40 Marks

SEMESTER - V

Sl. No	Paper	Title of the Paper	Instruction Hrs. per Week	No. of Credits:	Duration of the Exam.	Marks		
						Internal Assessment	Semester End Exam.	Total
1	BSCT A1-501	Artificial Intelligence	3	3	3 Hrs.	20	80	100
2	BSCT A2-502	Python Programming	3	3	3 Hrs.	20	80	100
3	BSCP A3-503	Artificial Intelligence and Python Lab	4	2	3 Hrs.	10	40	50
4	BSC SEC -504	a. Raspberry Pi Or b. Prolog	3	2	1 1/2 Hrs.	10	40	50
TOTAL			12	10				300

NOTE:

Theory: 1 Hr. = 1 Credit Practical: 2 Hrs. = 1 Credit

BSCT: BSC Computer Science Core Paper Theory
BSCP: BSC Computer Science Core Paper Practical

SEMESTER - VI

Sl. No	Paper	Title of the Paper	Instruction Hrs. per Week	No. of Credits:	Duration of the Exam.	Marks		
						Internal Assessment	Semester End Exam.	Total
1	BSCT A1-601	Software Engineering	3	3	3 Hrs.	20	80	100
2	BSCT A2-602	Web Technology	3	3	3 Hrs.	20	80	100
3	BSCP A3-603	Major Project	4	2	3 Hrs.	10	40	50
4	BSC SEC -604	Research Methodology and Survey Project	3	2	1 1/2 Hrs.	10	40	50
TOTAL			12	10				300

NOTE:

Theory: 1 Hr. = 1 Credit Practical: 2 Hrs. = 1 Credit

BSCT: BSC Computer Science Core Paper Theory

BSCP: BSC Computer Science Core Paper Practical

FIFTH SEMESTER			
Subject Name: Artificial Intelligence			
Subject Code:	BSCT A1-501	CIE Marks:	20
No. of Hours/Week:	3	SEE Marks:	80
Total Hours:	48	Credits:	3

COURSE OBJECTIVES:

1. Understand the fundamentals of Artificial Intelligence and intelligent systems.
2. Learn various search and problem-solving techniques used in AI.
3. Understand knowledge representation and logical reasoning methods.
4. Explore machine learning, expert systems, and modern AI applications.

COURSE OUTCOMES:

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

1. Explain fundamental concepts of Artificial Intelligence and intelligent agents.
2. Apply search and problem-solving techniques to AI problems.
3. Use logical reasoning and knowledge representation methods.
4. Describe machine learning, NLP, computer vision, and deep learning concepts.

	Fundamentals of Artificial Intelligence	Hours 10
UNIT 1	Introduction to Artificial Intelligence: Meaning and Definition of AI, History and Evolution of AI, Characteristics and Goals of AI, Applications of AI in Daily Life, Advantages and Limitations of AI Intelligent Agents: Concept of Agents and Environment, Types of Agents, Rational Agents, Agent Architecture, Agent Programs. Knowledge-Based Systems: Introduction to Knowledge-Based Agents, Knowledge Representation, Wumpus World Problem, Real-Life Examples of Intelligent Agents. Problem Solving in AI: Problem-Solving Agents, State Space Representation Components of a Problem, Performance Measures.	
	Search Techniques and Problem Solving	Hours 10
UNIT 2	Uninformed Search Techniques: Breadth First Search (BFS), Depth First Search (DFS), Iterative Deepening Search, Comparison of Search Algorithms. Informed Search Techniques: Heuristic Functions, Best First Search, A* Search Algorithm, AO* Search Algorithm. Adversarial Search and Game Playing: Introduction to Game Playing, Two-Player Zero-Sum Games, Minimax Algorithm, Alpha-Beta Pruning. Constraint Satisfaction Problems: Introduction to CSP, Variables, Domains, and Constraints, Backtracking Search.	

UNIT 3	Knowledge Representation and Reasoning	Hours 10
	Logic in AI: Introduction to Logic, Propositional Logic, Predicate Logic, Comparison of Propositional and Predicate Logic. Inference Techniques: Forward Chaining, Backward Chaining, Resolution Method, Truth Maintenance Systems. Planning in AI: Introduction to Planning, Blocks World Problem, STRIPS Representation, Goal-Based Planning. Reasoning Under Uncertainty: Non-Monotonic Reasoning, Probabilistic Reasoning, Introduction to Fuzzy Logic, Applications of Fuzzy Systems.	
UNIT 4	Machine Learning and Modern AI Technologies	Hours 09
	Introduction to Machine Learning: Concept and Need for Machine Learning, Types of Machine Learning, Supervised Learning, Unsupervised Learning, Reinforcement Learning, Applications of Machine Learning Natural Language Processing (NLP): Introduction to NLP, Text Processing, Speech Recognition, Chatbots and Virtual Assistants. Computer Vision: Image Processing Basics, Object Detection, Face Recognition, Applications of Computer Vision Deep Learning Fundamentals: Artificial Neural Networks, Introduction to Deep, AI Tools and Platforms.	
UNIT 5	Applications of Artificial Intelligence, Robotics, and Ethical Issues	Hours 09
	Robotics and Intelligent Systems: Introduction to Robotics, Components of Robots, Industrial and Service Robots, Autonomous Systems. Expert Systems: Definition and Characteristics, Architecture of Expert Systems, Knowledge Base and Inference Engine, Case Study: Medical Diagnosis System. AI Applications: AI in Education, AI in Healthcare, AI in Banking and Finance, AI in Agriculture, AI in E-Commerce. Ethical and Social Issues in AI: Responsible AI, Bias and Fairness, Privacy and Security Concerns, AI and Employment, Future Trends in AI.	

TEXT BOOKS:

1. **Stuart Russell and Peter Norvig**, Artificial Intelligence: A Modern Approach, 4th Edition, Pearson Education, 2021.
2. **Elaine Rich, Kevin Knight and Shivashankar B. Nair**, Artificial Intelligence, 3rd Edition, McGraw Hill Education, 2017.
3. **S. Kaushik and S. P. Mishra**, Artificial Intelligence, Cengage Learning India, 2019.

REFERENCE BOOKS:

1. **Nils J. Nilsson**, Artificial Intelligence: A New Synthesis, Morgan Kaufmann Publishers, 1998.
2. **George F. Luger**, Artificial Intelligence: Structures and Strategies for Complex Problem Solving, 6th Edition, Pearson Education, 2009.
3. **Eugene Charniak and Drew McDermott**, Introduction to Artificial Intelligence, Addison-Wesley, 1985.

FIFTH SEMESTER			
Subject Name: Python Programming			
Subject Code:	BSCT A2-502	CIE Marks:	20
No. of Hours/Week:	3	SEE Marks:	80
Total Hours:	48	Credits:	3

COURSE OBJECTIVES:

1. To introduce programming concepts using python
2. To use python programming to solve problems of different domains

COURSE OUTCOMES:

After completing this course satisfactorily, a student will be able to:

1. Explain the basic concepts of Python Programming.
2. Demonstrate proficiency in the handling of loops and creation of functions.

	Python Basics	Hours 8
UNIT 1	Introduction to Features and Applications of Python; Python Versions; Installation of Python; Python Command Line mode and Python IDEs; Simple Python Program. Python Basics: Identifiers; Keywords; Statements and Expressions; Variables; Operators; Precedence and Association; Data Types; Indentation; Comments; Built-in Functions- Console Input and Console Output, Type Conversions; Python Libraries; Importing Libraries with Examples. 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.	
	Functions, Strings, Exception Handling and Multithreading	Hours 10
UNIT 2	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. 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. Exception Handling: Types of Errors; Exceptions; Exception Handling using try,except and finally. Multithreading: creating a thread, synchronizing threads, multithreaded priority queue Modules: Importing module, Creating and exporting modules, Math module, Random module, Time module	

UNIT 3	Python Data Structure	Hours 10
	Lists: Creating Lists; Operations on Lists; Built-in Functions on Lists; Implementation of Stacks and Queues using Lists; Nested Lists. Dictionaries: Creating Dictionaries; Operations on Dictionaries; Built-in Functions on Dictionaries; Dictionary Methods; Populating and Traversing Dictionaries. 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.	
UNIT 4	OOPS, File Handling and Regular Expression	Hours 10
	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. File Handling: File Types; Operations on Files- Create, Open, Read, Write, Close Files; File Names and Paths; Format Operator. Regular Expressions – Concept of regular expression, various types of regular expressions, using match function.	
UNIT 5	SQLite, GUI and Visualization	Hours 10
	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. GU Interface: The tkinter Module; Window and Widgets; Layout Management- pack, grid and place. 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. Data Visualization: Introduction to Data Visualization; Matplotlib Library; Different Types of Charts using Pyplot- Line chart, Bar chart and Histogram and Pie chart.	

TEXT BOOKS:

1. Introduction to Python Programming, Gowrishankar S et al., CRC Press, 2019.
2. Python Data Analytics: Data Analysis and Science Using Pandas, matplotlib, and the Python Programming Language, Fabio Nelli, Apress®, 2015

REFERENCE BOOKS:

1. Think Python How to Think Like a Computer Scientist, Allen Downey et al., 2nd Edition,
2. Advance Core Python Programming, MeenuKohli, BPB Publications, 2021.

FIFTH SEMESTER			
Subject Name: Artificial Intelligence and Python Lab			
Subject Code:	BSCP A3-503	CIE Marks:	10
No. of Hours/Week:	4	SEE Marks:	40
Total Hours:	60	Credits:	2

LIST OF LAB PROGRAMS**Part - A : Python Programs**

1. Write a Python program to demonstrate input(), print(), sep, end, and replacement operator {} for formatted output.
2. Write a Python program to determine whether a given number is present in the Fibonacci sequence.
3. Write a Python program to find the roots of a quadratic equation using the quadratic formula.
4. Write a Python program to calculate the sum of the first n natural numbers entered by the user.
5. Write a Python program to display the multiplication table of a given number up to a specified limit.
6. Write a Python program to determine whether a given number is prime or composite.
7. Write a Python program to search for a given element in a list using the sequential search algorithm.
8. Develop a menu-driven calculator to perform addition, subtraction, multiplication, division, and modulus operations.
9. Create SQLite Database and Perform CRUD Operations on Tables
10. Create a simple Students application form using Tkinter module and store in database.

Part - B : Artificial Intelligence Programs Using Python

1. Use Matplotlib to plot line and bar charts for a sample dataset and interpret the results.
2. Use Matplotlib to create histogram and pie charts for analyzing numerical and categorical data.
3. Create one-dimensional and two-dimensional NumPy arrays and perform arithmetic operations, indexing, slicing, reshaping, and aggregation.
4. Read data from an Excel file into a Pandas DataFrame and perform operations such as filtering, sorting, grouping, handling missing values, and generating summary statistics.
5. Implement BFS algorithm to traverse a graph and find a goal node.
6. Write a Python program to find the shortest path between two nodes using A* Search.
7. Develop an AI-based Tic-Tac-Toe game using the Minimax algorithm.
8. Develop a rule-based chatbot for answering basic user queries.
9. Implement face detection using Haar Cascade Classifier.
10. Build a classifier using the Iris dataset and Decision Tree algorithm.

FIFTH SEMESTER - SEC			
Subject Name: Raspberry Pi			
Subject Code:	BSC SEC -504	CIE Marks:	10
No. of Hours/Week:	3	SEE Marks:	40
Total Hours:	45	Credits:	2

COURSE OBJECTIVES:

1. To introduce students to the Raspberry Pi hardware platform, its various models, SoC architecture, and pin configuration.
2. To familiarise students with Linux-based operating systems, essential Linux commands, and programming interfaces (Python and C) for Raspberry Pi.
3. To enable students to interface sensors and communication modules with Raspberry Pi for real-world data acquisition.
4. To develop the ability to design and deploy basic IoT applications using Raspberry Pi, web technologies, and protocols such as MQTT and Node-RED.

COURSE OUTCOMES:

Upon successful completion of this course, students will be able to:

1. Describe the architecture, SoC design, pin layout, and on-board components of various Raspberry Pi models.
2. Install and configure the Raspbian OS, execute Linux commands, and write basic Python and C programs for GPIO control on Raspberry Pi.
3. Interface sensors (temperature, humidity, motion, ultrasonic) and communication modules (GSM, Wi-Fi) with Raspberry Pi and connect them to a database.
4. Design and implement IoT-based applications using LAMP server, Node-RED, MQTT protocol, and web-based GPIO control on Raspberry Pi.

UNIT 1	Overview of Raspberry Pi	Hours 10
	Introduction to Raspberry Pi, Comparison of various Rpi Models, Understanding SoC architecture and SoCs used in Raspberry Pi, Pin Description of Raspberry Pi, On-board components of Rpi.	
UNIT 2	Bootting up RPi	Hours 10
	Operating System and Linux Commands, Linux- Introduction, Architecture, File System, Raspbian Operating System - Introduction, Tools like Leaf pad Editor, Installing Raspbian on Pi, First boot and Basic Configuration of Pi, Popular Linux Commands for RPi. Python for Sensing Data using Python. Using Wiring Pi for GPIO Programming, Interfacing Rpi using C.	

UNIT 3	Sensors Interfacing	Hours 08
	Temperature and Humidity Sensor, Motion Sensor, Obstacle detection using Ultrasonic sensor, etc. Communicating using RPi- GSM interfacing, accessing on-board Wi-Fi, Connecting Database with RPi	
UNIT 4	IoT Design using Raspberry Pi	Hours 07
	IoT Applications based on Pi, LAMP Web-server, GPIO Control over Web Browser, Creating Custom Web Page for LAMP, communicating data using on-board module, home automation using Pi, Node-RED, MQTT Protocol, Using Node-RED Visual Editor on Rpi	

TEXTS BOOKS:

1. Programming the Raspberry Pi, Second Edition: Getting Started with Python 2nd Edition by Simon Monk McGraw Hill Professional, 04-Jun-2021 - Technology & Engineering
2. Exploring Raspberry Pi: Interfacing to the Real World with Embedded Linux 1st Edition by Derek Molloy, Wiley Publications 2016.

REFERENCE BOOKS:

1. The Computer Programming Bible: A Step-by-Step Guide On How To Master From The Basics to Advance of Python, C, C++, C#, HTML Coding Raspberry Pi3 by C.P.A Inc 2020.
2. Raspberry Pi IoT Projects: Prototyping Experiments for Makers by John C. Shovic, APress 2016.

Practice Practical Programs (10 Hours)

1. Installation and configuration of Raspberry Pi OS.
2. Practice basic Linux commands and file operations.
3. GPIO LED blinking using Python.
4. Interfacing push button and LED using Raspberry Pi.
5. Temperature sensor interfacing and data display.
6. Humidity sensor interfacing using Python.
7. PIR motion sensor interfacing and motion detection.
8. Ultrasonic sensor interfacing for distance measurement.
9. Create a simple Node-RED dashboard for sensor monitoring.
10. Develop a mini IoT project:
 - Smart Home Automation System, or
 - Smart Room Monitoring System, or
 - IoT-based Temperature Monitoring System. Bottom of Form

Note: The above practical programs are for practice purposes only. There is no laboratory examination for this subject. The evaluation will be based solely on a theory examination for 40 marks.

FIFTH SEMESTER – SEC			
Subject Name: Prolog			
Subject Code:	BSC SEC -504	CIE Marks:	10
No. of Hours/Week:	3	SEE Marks:	40
Total Hours:	45	Credits:	2

COURSE OBJECTIVES:

1. Introduce the concepts of Logic Programming and Artificial Intelligence.
2. Develop problem-solving skills using Prolog.
3. Understand facts, rules, queries, recursion, and list processing.
4. Apply Prolog for knowledge representation and reasoning.

COURSE OUTCOMES:

After completing the course, students will be able to:

1. Understand the principles of Logic Programming.
2. Write Prolog programs using facts, rules, and queries.
3. Implement recursive and list-processing solutions.
4. Develop simple knowledge-based systems.

UNIT 1	Introduction to Logic Programming	Hours 10
	Introduction to Artificial Intelligence and Logic Programming, History and Features of Prolog , Structure of a Prolog Program, Facts, Rules, and Queries, Variables, Constants, and Predicates, Prolog Execution Model , Simple Prolog Examples.	
UNIT 2	Control Structures and Recursion	Hours 10
	Unification and Backtracking, Arithmetic Operations in Prolog, Decision Making using Rules, Recursive Predicates,Tail Recursion, Solving Mathematical Problems using Recursion, Debugging Prolog Programs.	
UNIT 3	Lists and Knowledge Representation	Hours 08
	Introduction to Lists, List Operations, Membership, Concatenation, and Length of Lists, Recursive List Processing, Knowledge Representation in Prolog, Family Tree and Relationship Modeling, Database Representation using Facts.	
UNIT 4	Expert Systems and AI Applications	Hours 07
	Introduction to Expert Systems, Knowledge Base and Inference Engine, Rule-Based Reasoning, Decision Support Systems, Natural Language Processing Basics in Prolog, AI Applications of Prolog, Case Studies and Mini Projects.	

TEXT BOOKS:

1. Kenneth H. Rosen, Discrete Mathematics and its Applications, McGraw Hill Publications, 7th Edition, 2007.
2. J. P. Tremblay and R. P. Manohar, Discrete Mathematical Structures with Applications to Computer Science, McGraw Hill Education Inc., 2002.
3. S. C. Gupta and V. K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons Educational Publishers, New Delhi, 2020.

REFERENCE BOOKS:

1. Ralph P. Grimaldi, Discrete and Combinatorial Mathematics, 5th Edition, Pearson Education, 2004.
2. C. L. Liu and D. P. Mohapatra, Elements of Discrete Mathematics: A Computer Oriented Approach, McGraw Hill, 3rd Edition, 2012.
3. P. G. Hoel, S. C. Port, and C. J. Stone, Introduction to Probability Theory, Universal Book Stall.
4. Sheldon Ross, A First Course in Probability, 6th Edition, Pearson Education India.
5. William Feller, An Introduction to Probability Theory and Its Applications, Vol. 1, Wiley.

Practice Practical Programs (10 Hours)

1. Installation of SWI-Prolog and execution of simple programs.
2. Write a Prolog program to represent family relationships using facts and rules.
3. Write a Prolog program to find the maximum of two and three numbers.
4. Write a Prolog program to calculate factorial using recursion.
5. Write a Prolog program to calculate Fibonacci series.
6. Write a Prolog program to check membership of an element in a list.
7. Write a Prolog program to find the length of a list.
8. Write a Prolog program to concatenate two lists.
9. Develop a simple student information knowledge base and perform queries.
10. Develop a simple expert system for career guidance or disease diagnosis.

Note: The above practical programs are for practice purposes only. There is no laboratory examination for this subject. The evaluation will be based solely on a theory examination for 40 marks.

SIXTH SEMESTER			
Subject Name: Software Engineering			
Subject Code:	BSCT A1-601	CIE Marks:	20
No. of Hours/Week:	3	SEE Marks:	80
Total Hours:	48	Credits:	3

COURSE OBJECTIVES:

1. To Acquire a comprehensive understanding of the software development lifecycle and its application in contemporary software engineering practices.
2. To Develop proficiency in project management methodologies and strategic decision making for successful software project execution.
3. To Master the art of software design, development, and testing to produce robust and efficient software solutions.

COURSE OUTCOMES:

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

1. An ability to understand basic concepts of software engineering.
2. An ability to describe project management methodologies and strategic decision making for successful software project execution.
3. An ability to understand software design, development, and testing to produce robust and efficient software solutions.

UNIT 1	Introduction	Hours 8
	The evolving role of software, changing nature of software, layered technology, a process framework, Process models: The waterfall model, incremental process models, evolutionary process models, the unified process. Agile software development: Agility Principles, Agile methods, Plan-driven and agile development, Extreme programming, Scrum, A Tool Set for the Agile Process.	
UNIT 2	Software Requirements Engineering and Risk Management	Hours 10
	Software Requirements Engineering: Functional and non-functional requirements, the software requirements document, Requirements specification, Requirements engineering processes, Requirements elicitation and analysis, Requirements validation, Requirements management. Risk Management: Reactive Vs proactive risk strategies, software risks, risk identification, risk projection, risk refinement, RMMM, RMMM plan.	

UNIT 3	Project Planning and Design	Hours 10
	Project Planning- Software pricing, Plan-driven development, Project scheduling, Agile planning, Estimation techniques. Design: Design process and design quality, design concepts, the design model, software architecture, data design, architectural design, Basic structural modeling, class diagrams, sequence diagrams, collaboration diagrams, use case diagrams, component diagrams.	
UNIT 4	Testing and Metrics	Hours 10
	Testing Strategies: A strategic approach to software testing, test strategies for conventional software, black-box and white-box testing, validation testing, system testing, the art of debugging. Product Metrics: Software quality, metrics for analysis model, metrics for design model, metrics for source code, metrics for testing, metrics for maintenance.	
UNIT 5	Quality and Release Management	Hours 10
	Quality Management: Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability. Release Management: Release planning, development and build plans, release strategies, risk management, and post-deployment monitoring. Product Sustenance: Maintenance, updates, End of life, migration strategies.	

TEXT BOOKS:

1. Software Engineering, N.S. Gill, Khanna Publishing House, 2023
2. Software Engineering, Ian Sommerville, 9th edition, Pearson education.
3. Software Engineering A practitioner's Approach, 8th edition, Roger S Pressman, Bruce R. Maxim. McGraw Hill Education, 2015.

REFERENCE BOOKS:

1. Stephen Schach, Software Engineering 7th ed, McGraw-Hill, 2007
2. Software Engineering: Principles and Practice Hans van Vliet

SIXTH SEMESTER			
Subject Name: Web Technology			
Subject Code:	BSCT A2-602	CIE Marks:	20
No. of Hours/Week:	3	SEE Marks:	80
Total Hours:	48	Credits:	3

COURSE OBJECTIVES:

1. To understand the concepts and architecture of the World Wide Web, Markup languages along with Cascading Style Sheets.
2. To understand the concepts of event handling and data validation mechanisms.
3. To understand the concepts of embedded dynamic scripting on client and server side Internet Programming and basic full stack web development.
4. To develop modern interactive web applications.

COURSE OUTCOMES:

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

1. Learn about WWW and webpage.
2. Understand domain and assigning name to them.
3. Understand basic web languages and its components.
4. Perform simple web page designing for practical exposure.

UNIT 1	Basics of Internet and Web	Hours 10
	The basics of Internet , World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page, Overview of Protocols – Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Simple Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts. Working of Websites , Webpages, Front End, Back End, Client and Server Scripting Languages, Responsive Web Designing, Types of Websites (Static and Dynamic Websites). Editors Downloading free Editors like Notepad++, Sublime Text Editor, making use of Editors, File creation and editing, saving.	
UNIT 2	Introduction to HTML	Hours 10
	Introduction to HTML, Essential Tags, Tags and Attributes, Text Styles and Text Arrangements, Text, Effects, Exposure to Various Tags (DIV, MARQUEE, NOBR, DFN, HR, LISTING, Comment, IMG), Color and Background of Web Pages, Lists and their Types, Attributes of Image Tag, Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, Links to External Documents, Different Section of a Page and Graphics, Footnote and eMailing, Creating Table, Frame, Form and Style Sheet. Dynamic HTML, Document Object Model, Features of DHTML	

UNIT 3	CSS	Hours 8
	CSS: Introduction to CSS, Types of CSS, CSS Selectors: Universal Selector, ID selector, Tag Selector, Class Selector, Sub Selector, Attribute Selector, Group Selector, CSS Properties: Back Ground properties, Block Properties, Box properties, List properties, Border Properties, Positioning Properties, CSS Lists CSS Tables, CSS Menu Design CSS Image Gallery, CSS Framework Web Site Development using W3.CSS Framework, W3.CSS Intro, W3.CSS Colors, W3.CSS Containers, W3.CSS Panels, W3. CSS Borders, W3.CSS Fonts, W3.CSS Text, W3.CSS Tables, W3.CSS List, W3.CSS Images, W3.CSS Grid	
UNIT 4	Java Script	Hours 8
	Introduction to Client Side Scripting Language, Literals , Operators, Data Types, Functions, Methods, Type Casting and Objects in JavaScript, Conditions Statements, JS Popup Boxes, JS Events, Basic Form Validations in JavaScript. Introduction to Angular JS: Expressions, Modules and Directives. Relating JavaScript to DHTML, Dynamically Changing Text, Style, and Content.	
UNIT 5	PHP	Hours 12
	Server Side Programming , Introduction to PHP, Basic Programming Concepts of PHP: Variables, Data-types, Constants, Scope of Variables, Type of Variables, Type Casting, Operators, Operators Precedence, References, Arrays; Control Structures: Branching, If statement, Switch statement; Looping: for Loop, while Loop, do while Loop, for each Loop; Functions: User Defined Functions, Built-in Function, Functions for Variables; Script Controlling Functions, Array Functions, Date and Time Functions, Mathematical Functions, String Functions, PHP Server Variables; Working with form, Database Connectivity using PHP (CRUD Operations: Create, Read, Update, Delete).Building a simple dynamic web application such as Student Registration, Login System, or Employee Management System.	

TEXT BOOKS:

1. **Kogent Learning Solutions Inc.** – *HTML5 Black Book*, Dreamtech Press.
Comprehensive guide covering HTML5, CSS3, JavaScript, and modern web development concepts.
2. **Luke Welling & Laura Thomson** – *PHP and MySQL Web Development*, Addison-Wesley.
Well-known textbook for learning PHP programming and MySQL database integration.
3. **Jon Duckett** – *HTML & CSS: Design and Build Websites*, Wiley.
Beginner-friendly book with visual explanations of HTML5 and CSS3 concepts.
4. **Jon Duckett** – *JavaScript and jQuery: Interactive Front-End Web Development*, Wiley.
Covers JavaScript fundamentals and techniques for creating interactive web pages.

REFERENCE BOOKS:

1. **Robin Nixon** – *Learning PHP, MySQL & JavaScript*, O'Reilly Media.
Practical reference for full-stack web application development using PHP and JavaScript.
2. **David Flanagan** – *JavaScript: The Definitive Guide*, O'Reilly Media.
Authoritative reference covering modern JavaScript programming and browser APIs.
3. **Elisabeth Robson & Eric Freeman** – *Head First HTML and CSS*, O'Reilly Media.
Concept-oriented book with hands-on examples for learning HTML and CSS.

SIXTH SEMESTER			
Subject Name: Major Project			
Subject Code:	BSCP A3-603	CIE Marks:	10
No. of Hours/Week:	2	SEE Marks:	40
Total Hours:	60	Credits:	2

PROJECT GUIDELINES

Project Instructions:

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- **Type of the Project**
 - ✓ The project report should be documented with scientific approach to the solution of the problem that the students have sought to address.
 - ✓ The majority of the students are expected to work on a latest real-life project.
 - ✓ The project should be prepared in order to solve the problem in a methodical and professional manner, making due references to appropriate techniques, technologies and professional standards.
 - ✓ Use the latest versions of the software packages for the development of the project.
- Project should be carried out in batch with minimum of 3 and maximum of 5 students, and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea.
- The Project work should be compulsorily done in the College/ Software Industry /R&D Centres/ only under the supervision of the concerned department staff.
- The student should also include the details from the project diary, in which they will record the progress of their project throughout the course.
- University Exam will be conducted as follows.

Viva-voce will be conducted at the end of VI semester.

Both the Examiners (50%+50%) should conduct the Viva-Voce Examination during practical exam session. Out of the 50 marks, 25 for Project Evaluation and 15 for Project Report and 10 for Viva. For awarding a pass, a candidate should have obtained 40% of the Total marks.
- **Report Preparation:** The content of the Project report must be paid utmost attention, which is being submitted in partial fulfilment of the requirements of Degree. The project report should contain enough details to enable examiners to evaluate the work. The important points should be highlighted in the body of the report, with details often referred to appendices.
 - ✓ **Paper:** Report should be done on A4 Size paper

- ✓ Text: Times new roman with 1.5-line spacing. Running text font is 12, Sub heading 14 pt. bold. Chapter Heading is 20 pts. Justified
- ✓ Margins: Left margin 1.5, right, top, bottom is 1 inch. Header, footer, no page border
- ✓ Fig: Tables, graph, diagrams should have respective number, caption and source.
- ✓ Student shall maintain project diary and get signatures from both guide and department head.

Recommended Chapter Sequence

1. Cover Page
2. Inner Title Page
3. Original Copy of the Approved Proforma of the Project Proposal
4. Certificate of Authenticated work
5. Role and Responsibility Form
6. Certificate
7. Acknowledgement
8. Abstract
9. Table of Contents
10. List of Figures
11. List of Tables
12. Introduction
13. Literature Survey / Review
14. System Analysis & Design
15. Implementation / Methodology
16. Results & Discussion
17. Conclusion & Future Work
18. References
19. Appendices

SIXTH SEMESTER			
Subject Name: Research Methodology and Survey Project			
Subject Code:	BSC SEC -604	CIE Marks:	10
No. of Hours/Week:	3	SEE Marks:	40
Total Hours:	45	Credits:	2

COURSE OBJECTIVES:

After studying this course, students will be able to:

1. Understand the fundamental concepts, objectives, significance, and process of research.
2. Identify and formulate research problems, literature review and develop appropriate research designs.
3. Learn various methods of data collection and select suitable techniques for research studies.
4. Develop skills in research report writing, presentation, and documentation.
5. Understand the role of computers and information technology in conducting and supporting research activities.

COURSE OUTCOMES:

1. Explain research concepts, types, approaches, methodologies, and the importance of research in various domains.
2. Identify research problems, formulate objectives, literature review and design suitable research plans and sampling strategies.
3. Apply appropriate primary data collection methods such as observation, interviews, questionnaires, and schedules.
4. Prepare and present research reports following standard formats, ethical practices, and reporting guidelines.

UNIT 1	Introduction	Hours 10
	Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research Process, Criteria of Good Research, Problems Encountered by Researchers in India.	
UNIT 2	Research Problem and Literature Review	Hours 10
	What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem. Reviewing the literature: Place of the literature review in research, how to review the literature, searching the existing literature, reviewing the selected literature, writing about the literature reviewed.	
UNIT 3	Research Design and Data Collection	Hours 10
	Meaning of Research Design, Need for Research Design, Features of a Good Design, Steps in Sampling Design. Collection of Primary Data, Observation Method, Interview Method, Collection of Data through Questionnaires, Collection of Data through Schedules, Difference between Questionnaires and Schedules.	

UNIT 4	Report Writing	Hours 08
	Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics and precautions for Writing a Research Report.	
UNIT 5	Computer Role in Research	Hours 07
	Introduction, The Computer and Computer Technology, The Computer System, Important Characteristics, Computer Applications, Computers and Researcher.	

TEXT BOOKS:

1. Research Methodology: Methods and Techniques C.R. Kothari, Gaurav Garg New Age International 4th Edition, 2018
2. Ranjit Kumar, Research Methodology- A step by step guide for beginners, Pearson Education, Australia, 2005
3. Stuart Melville and Wayne Goddard, "Research methodology: an introduction for science & engineering students", Juta & Company, 1996.

REFERENCE BOOKS:

1. Robert P. Merges, Peter S. Menell and Mark A. Lemley, "Intellectual Property in New Technological Age", Aspen Publishers, 2016.
2. Halbert, "Resisting Intellectual Property", Taylor & Francis Ltd ,2007.
3. Mayall , "Industrial Design", McGraw Hill, 1992.
4. Niebel , "Product Design", McGraw Hill, 1974.
5. Asimov , "Introduction to Design", Prentice Hall, 1962.

Note: Students must prepare a survey Report (including Literature Review and Data Collection Details) on their major project topic and submit it to the concerned department for internal assessment of this subject. Five marks are allotted for this activity.

Internal Assessment Marks Allotment for Research Methodology and Survey Project	
Internal Test 1	03
Internal Test 2	
Assignment	02
Survey Report Submission	05
TOTAL	10

Question Paper Pattern for Semester End Examination (SEE)
(Common for V and VI Semester)
SUBJECT NAME

Time: 3 Hrs

Max. Marks: 80

Instruction to Candidate: Answer all the Sections

SECTION A

I. Answer any ten of the following questions (10X2 = 20)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

SECTION B

II. Answer any five of the following questions (5X5 = 25)

- 13.
- 14.
- 15.
- 16.
- 17.
- 18.
- 19.

SECTION C

III. Answer any five of the following questions (5X7 = 35)

- 20.
- 21.
- 22.
- 23.
- 24.
- 25.
- 26.

Question Paper Pattern for Semester End Examination (SEC)
(Common for V and VI Semester)
SUBJECT NAME

Time: 1 1/2 Hrs

Max. Marks: 40

Instruction to Candidate: Answer all the Sections

SECTION A

I. Answer any ten of the following questions

(10X2 = 20)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

SECTION B

II. Answer any four of the following questions

(4X5 = 20)

- 13.
- 14.
- 15.
- 16.
- 17.
- 18.