Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Information Technology

B.Tech. (CSE-Generative AI-IBM)
Choice Based Credit System (CBCS)-2025-29
SEMESTER-I

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCSH102	DCC	Statistics, Probability and Calculus	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:	
The student will have ability to:	
1.	To introduce fundamental concepts of statistics and probability.

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	To learn and understand the basic concepts of probability theory.
2.	To learn types of data and graphical representation.
3.	To learn descriptive statistics, probability distribution and sampling techniques.

SYLLABUS

UNIT I	**10 HOURS**

Introduction to Statistics: Definition of Statistics. Basic objectives. Applications in Various Branches of Science with Examples. Collection of Data: Internal and External Data, Primary and Secondary Data. Population and Sample, Representative Sample.

UNIT II	**9 HOURS**

Descriptive Statistics: Classification and Tabulation of Univariate Data, Graphical Representation, Frequency Curves. Descriptive Measures - Central Tendency and Dispersion. Bivariate Data. Summarization, Marginal and Conditional Frequency Distribution.

UNIT III	**8 HOURS**

Probability: Concept of Experiments, Sample Space, Event. Definition of Combinatorial Probability. Conditional Probability, Bayes Theorem. Probability Distributions: Discrete & Continuous Distributions, Binomial, Poisson and Geometric Distributions, Uniform, Exponential, Normal, Chi-Square, T, F Distributions.

UNIT IV	**7 HOURS**

Expected Values and Moments: Mathematical Expectation and its Properties, Moments (Including Variance) and their Properties, Interpretation, Moment Generating Function

UNIT V	**8 HOURS**

Calculus: Basic Concepts of Differential and Integral Calculus, Application of Double and Triple Integral.

TEXTBOOKS:

1.	Introduction of Probability Models, S.M. Ross, Academic Press, N.Y.

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BTCSH102	DCC	Statistics, Probability and Calculus	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

2.	Fundamentals of Statistics, vol. I & II, A. Goon, M. Gupta and B. Dasgupta, World Press.
REFERENCE:	
1.	Higher Engineering Mathematics, B. S. Grewal, Khanna Publication, Delhi.
2.	A first course in Probability, S.M. Ross, Prentice Hall.
3.	Probability and Statistics for Engineers, (Fourth Edition), I.R. Miller, J.E. Freund and R. Johnson, PHI.
4.	Introduction to the Theory of Statistics, A.M. Mood, F.A. Graybilland D.C. Boes, McGraw Hill Education.
5.	Advanced Engineering Mathematics, (Seventh Edition), Peter V. O'Neil, Thomson Learning.
6.	Advanced Engineering Mathematics, (Second Edition) M. D. Greenberg, Pearson Education.
7.	Applied Mathematics, Vol. I & II, P. N. Wartikarand J. N. Wartikar, Vidyarthi Prakashan.

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BTIBM109N	DC	Fundamental of AI & ML	60	20	20	30	20	3	1	2	5

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COURSE OBJECTIVES:	
The student will have ability to:	
1.	To develop foundational understanding of core AI concepts, including machine learning, neural networks, deep learning, and Generative AI models such as large language models (LLMs).
2.	To explore key AI application domains, such as natural language processing, computer vision, robotics, and industry-specific use cases, highlighting AI's role in driving innovation.
3.	To enable learners to understand ethical, social, and governance considerations in AI development and deployment, and gain practical exposure through hands-on labs and projects.
COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Explain fundamental AI techniques, including ML, deep learning, NLP, and Generative AI models.
2.	Apply AI tools and methods to real-world problems by performing hands-on experiments, analyzing datasets, and implementing basic AI solutions across different domains.
3.	Evaluate the impact of AI on businesses and society, demonstrating awareness of ethical issues, responsible AI practices, and governance frameworks.
SYLLABUS	
UNIT I	
Module 0: Welcome • Video: Course Introduction • Reading: General Information • Reading: Learning Objectives and Syllabus • Helpful Tips for Course Completion • Grading Scheme	
UNIT II	
Module 1: Introduction and Applications of AI • Reading: Module Introduction and Learning Objectives • Video: Introducing AI • Video: Artificial Intelligence vs. Augmented Intelligence • Video: Introducing Generative AI and Its Use Cases	

Chairperson **Chairperson** **Controller of Examination** **Registrar**

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- Reading: Different types of AI
- Video: The Evolution of AI: Traditional AI vs. Generative AI
- Video: Artificial Intelligence - Are We There Yet?
- Video: AI in Daily Life
- Video: AI Chatbots and Smart Assistants
- Video: What Is a Chatbot?
- Lab: AI Assistant-User Conversations
- Video: Applications of AI in Different Industries
- Video: Generative AI Tools and Applications
- Video: Ten Everyday AI and Machine Learning Use Cases
- Lab: Generative AI Tools in Action
- Practice Quiz: Module 1: Introduction and Applications of AI
- Module Summary
- Graded Quiz: Introduction and Applications of AI

UNIT III

Module 2: AI Concepts, Terminology, and Application Domains

- Reading: Module Introduction and Learning Objectives
- Video: Cognitive Computing
- Video: Terminologies and Related Concepts of AI
- Video: Machine Learning
- Video: Machine Learning: Techniques and Training
- Video: Deep Learning
- Video: Neural Networks
- Video: Machine Learning vs. Deep Learning

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- Video: Generative AI Models
- Video: Large Language Models
- Activity: AI Integration in Everyday Life
- Video: Machine Learning vs. Deep Learning vs. Foundation Models
- Video: Natural Language Processing, Speech, and Computer Vision
- Video: What Is NLP (Natural Language Processing)?
- Video: Self-Driving Cars
- Video: AI and Cloud Computing, Edge Computing, and IoT
- Practice Quiz: Module 2: AI Concepts, Terminology, and Application Domains
- Module Summary
- Graded Quiz: AI Concepts, Terminology, and Application Domains

UNIT IV

Module 3: Business and Career Transformation Through AI

- Reading: Module Introduction and Learning Objectives
- Video: AI Agents
- Video: What Are AI Agents?
- Video: Robotics and Automation
- Video: Transforming Businesses Through AI
- Video: The Rise of Generative AI for Business
- Lab: Generative AI for Business Transformation
- Video: Become a Value Creator with Generative AI
- Reading: Introduction to RAG
- Video: What Is Retrieval-Augmented Generation (RAG)?
- Video: Adopting AI in Your Business

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			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTIBM109N	DC	Fundamental of AI & ML	60	20	20	30	20	3	1	2	5

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

- Video: Frameworks for AI Adoption
- Reading: AI Adoption Frameworks: Amazon, OpenAI, and Facebook
- Video: Transforming Your Work Through AI Tools
- Video: Career Opportunities with AI
- Lab: Using Generative AI for Your Work
- Video: Humans vs. AI: Who Should Make the Decision?
- Practice Quiz: Module 3: Business and Career Transformation Through AI
- Module Summary
- Graded Quiz: Business and Career Transformation Through AI

UNIT V

Module 4: Issues, Concerns, and Ethical Considerations

- Reading: Module Introduction and Learning Objectives
- Video: Ethical Considerations and Responsible Use of AI
- Video: Considerations Around Generative AI
- Video: Why Large Language Models Hallucinate
- Video: Perspective of Key Players Around AI Ethics
- Video: The Importance of AI Governance
- Activity: Responsible Use of AI at Work
- Video: How to implement AI Ethics
- Practice Quiz: Module 4: Issues, Concerns, and Ethical Considerations
- Reading: Lesson Summary
- Final Project: Transforming Organizational Functions with Generative AI

REFERENCE:

1. IBM Study Materials

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			THEORY			PRACTICAL					
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BTCS101M	BEC	Introduction to Computer Science and Engineering	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

COURSE OBJECTIVES:	
The student will have ability to:	
1.	To introduce the fundamentals concepts of Computer system.
2.	Understanding the basic concepts and features of various kinds of Operating systems.
3.	Learning the Concepts of Office Automation Tools.
4.	To provide knowledge of Networking, Internet, Communication and security.

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Understand the basic terminologies of Computer System.
2.	Gain knowledge about various kinds of Operating Systems and their features.
3.	Learn the Concepts of Office Automation Tools.
4.	Understand Networking, Internet, Communication and Security.

SYLLABUS

UNIT I	**8 HOURS**
Introduction: Introduction to Computers, Hardware and Software, Classification and History of Computers, Functions of the different Units, Applications of Computers, Representation of data and information, Machine language, Assembly Language, High level Language, Number System and Conversion.	

UNIT II	**6 HOURS**
Introduction to Operating System: Definition of Operating System, Types and Functions of Operating Systems, Free and Open-Source Software. **Introduction to Database Management System:** Introduction, File Oriented Approach and Database, importance and applications of DBMS.	

UNIT III	**8 HOURS**
Introduction to Computer Network: Introduction, importance of Computer Network, LAN, MAN, WAN, Networking Devices, World Wide Web, Web Browser, viruses, worms, malware, Use of Antivirus software, Good Computer Security Habits.	

UNIT IV	**8 HOURS**
Introduction to HTML: HTML Documents, SGML, Basic structure of an HTML document, Text Elements, Tag Elements, Special Character elements, Image tags, HTML Table tags and lists, Anchor tag, Name tag, Hyperlinks –	

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			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS101M	BEC	Introduction to Computer Science and Engineering	60	20	20	0	0	3	0	0	3

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

FTP/HTTP/HTTPS, Static and Dynamic Web Pages.

UNIT V **6 HOURS**

Office Automation Tools: Introduction to Microsoft Word, Elements of word Processing and Working Objectives, MSWord Screen and its Components, Features of word, Introduction to MS-Excel, MS-Excel Screen and Its Components, Features of Excel, Manipulation of cells, Formatting of Spreadsheet and Cells, Formulas and Functions, Introduction to MS-PowerPoint, MS-PowerPoint Screen and Its Components, Features of PowerPoint, Working with MS-PowerPoint, Preparation of Slides, Creation of Presentation, Slide Manipulation and Slide Show, Presentation of the Slides.

TEXTBOOKS:

1. E Balagurusamy, “Fundamentals of Computers”, TMH.
2. Silakari and Shukla, “Basic Computer Engineering”, Wiley India.

REFERENCE:

1. V. Rajaraman, Neeharika Adabala, “Fundamentals of Computers”, PHI.
2. Ajoy Kumar Ray and Tinku Acharya, “Basic Computer Engineering”, PHI.
3. P K Sinha, “Fundamentals of Computers”, BPB Publications.
4. J. P. Tremblay and R.B. Bunt, “An Introduction of Computer Science –An Algorithmic Approach”, TMH.
5. Faithe Wempen, "Computing Fundamentals: Introduction to Computers”, Wiley.
6. Norton, Peter, “Introduction to Computers”, Fourth revised, Mc-Graw-Hill.
7. Reema Thareja, “Fundamental of Computers”, Oxford University Press.

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HUCS101	SEC	Communication Skills	60	20	20	30	20	1	0	2	2

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COURSE OBJECTIVES:	
The student will have ability to:	
1.	Develop the second language learners 'ability to enhance and demonstrate LSRW Skills.
2.	Enable students to acquire English Language Skills to further their studies at advanced levels.
3.	Prepare students to become more confident and active participants in all aspects of their undergraduate programs

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Enhance confidence in their ability to read, comprehend, organize, and retain written in formation.
2.	Write grammatically correct sentences for various forms of written communication to express oneself.

SYLLABUS

UNIT I	**10 HOURS**
Communication: Nature, Meaning, Definition,Verbal and Non Verbal Communication Barriers to Communication.	

UNIT II	**9 HOURS**
Basic Language Skills: Grammar and usage- Parts of Speech, Tenses, S-V Agreement, Preposition, Article.	

UNIT III	**8 HOURS**
Basic Language Skills: Types of Sentence, Direct - Indirect, Active - Passive voice, Phrases& Clauses.	

UNIT IV	**7 HOURS**
Business Correspondence: Business Letter, Parts & Layouts of Business Resume and Job application, E-mail writing.	

UNIT V	**8 HOURS**
Report Writing: Importance of Report, Types of Report, Structure of a Report.	

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HUCS101	SEC	Communication Skills	60	20	20	30	20	1	0	2	2

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TEXTBOOKS:	
1.	Ashraf Rizvi.(2005).EffectiveTechnical Communication. NewDelhi:TataMcGrawHill
2.	Adair, John (2003). Effective Communication. London: Pan Macmillan Ltd.
3.	A.J.ThomsonandA.V.Martinet(1991).APracticalEnglishGrammar(4thed).Newyork:Ox-ford IBH Pub.
REFERENCE:	
1.	Kratz, Abby Robinson (1995). Effective Listening Skills. Toronto: ON: Irwin Professional Publishing.
2.	Prasad, H. M.(2001) How to Prepare for Group Discussion and Interview. New Delhi: Tata McGraw-Hill.
3.	Pease, Allan. (1998).Body Language. Delhi: SudhaPublications.
LIST OF PRACTICALS	
1.	Self Introduction
2.	Reading Skills and ListeningSkills
3.	OralPresentation
4.	Linguistics andPhonetics
5.	JAM (Just aMinute)
6.	GroupDiscussion

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BTCS103M	DCC	Computer System Organization	60	20	20	30	20	3	0	2	4

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COURSE OBJECTIVES:	
The student will have ability to:	
1.	To understand the basic model of a modern computer with its various processing units.
2.	To impart knowledge on CPU and it's processing of programs.
3.	To provide the information for hardware utilization methodology.
4.	To impart knowledge of Multiprocessor and inter-process communication.

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Understand the architecture of a modern computer.
2.	Explain the functional behavior of CPU and its other processing units.
3.	Knowledge of the Peripherals of a Computer System.
4.	Give the information to speed-up the working of Computer System.

SYLLABUS

UNIT I	**10 HOURS**
Computer Basics: Von Newman model, CPU, Memory, I/O, Bus, Memory registers, Program Counter, Accumulator, Instruction register, Micro-operations, Register Transfer Language, Instruction cycle, Instruction formats and addressing modes.	

UNIT II	**9 HOURS**
Control Unit Organization: Hardwired control unit, Micro-programmed control unit, Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming. **Arithmetic and Logic Unit**: Arithmetic Processor, Addition, subtraction, multiplication, and division, Floating point, and decimal arithmetic.	

UNIT III	**8 HOURS**
Input Output Organization: Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor, Data transferring approaches and modes.	

UNIT IV	**7 HOURS**
Memory organization: Memory Hierarchy, Cache Memory - Organization and types of cache mappings, Virtual memory, Memory Management Hardware.	

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BTCS103M	DCC	Computer System Organization	60	20	20	30	20	3	0	2	4

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UNIT V	**8 HOURS**
Multiprocessors: Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.	
TEXTBOOKS:	
1.	M. Morris Mano, Computer System Architecture, Fourth edition, Pearson Education, 2015.
2.	William Stallings, Computer Organization and Architecture, Seventh Edition, PHI, 2009.
REFERENCE:	
1.	Andrew S. Tanenbaum, Structured Computer Organization, Sixth Edition, Pearson Education, 2016.
2.	John P. Hayes, Computer Architecture and Organizations, Third edition, Mc-Graw Hills, New Delhi, 2017.
3.	John L. Hennessy and David A. Patterson, Computer Architecture a quantitative approach, Fourth Edition, Elsevier, 2007.
4.	Ramesh Gaonkar, Microprocessor Architecture, Programming and Applications with 8085, fifth Edition, Prentice Hall, 2015.
5.	Nicholas Carter, Computer Architecture (Schaum's), Third Edition, TMH, 2012.
6.	Carl Hamacher, Computer Organization, Fifth Edition, TMH, 2002.
LIST OF PRACTICALS	
1.	Study of peripherals, components of a Computer System.
2.	Write a C program for sum of two binary numbers.
3.	Write a C program for multiplication of two binary numbers.
4.	Write a C program to implement Booth's algorithm for multiplication.
5.	Write a C program to implement Restoring Division Algorithm.
6.	Write the working of 8085 simulator GNUsim8085 and basic architecture of 8085 along with small introduction.
7.	Study the complete instruction set of 8085 and write the instructions in the instruction set of 8085 along with examples.
8.	Write an assembly language code in GNUsim8085 to implement data transfer instruction.
9.	Write an assembly language code in GNUsim8085 to store numbers in reverse order in memory location.
10.	Write an assembly language code in GNUsim8085 to add two 8 bit numbers stored in memory and also storing the carry.

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BTCS107M	SEC	Program Development using C	0	0	0	30	20	0	0	2	1

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COURSE OBJECTIVES:	
The student will have ability to:	
1.	Identify situations where computational methods and computers would be useful.
2.	Given a computational problem, identify and abstract the programming task involved.
3.	Approach the programming tasks using techniques learned and write pseudo-code.
4.	Choose the right data representation formats based on the requirements of the problem.
5.	Use the comparisons and limitations of the various programming constructs and choose the right one for the task in hand.
6.	Write the program on a computer, edit, compile, debug, correct, recompile and run it.
7.	Identify tasks in which the numerical techniques learned are applicable and apply them to write programs, and hence use computers effectively to solve the task.

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Understand the basic terminologies used in computer programming.
2.	Proficient in using the basic constructs of C, to develop a computer program.
3.	Understand the use of functions, pointers, arrays and files in programming.
4.	Understand the fundamentals of procedure-oriented programming and be able to apply it in computer program development.

SYLLABUS

UNIT I	**7HOURS**

Introduction to Programming Languages: Evolution of Programming Languages, Structured Programming, The Compilation Process, Object Code, Source Code, Executable Code, Operating Systems, Interpreters, Linkers, Loaders, Fundamentals Of Algorithms, Flowcharts.

UNIT II	**10 HOURS**

Introduction to 'C' Language: Character Set. Variables and Identifiers, Built-In Data Types. Variable Definition, Arithmetic Operators and Expressions, Constants And Literals, Simple Assignment Statement, Basic Input/ Output Statement, Decision Making Within A Program, Conditions, Relational Operators, Logical Connectives, If Statement, If-Else Statement, Loops: While Loop, Do While, For Loop. Nested Loops, Switch Statement.

UNIT III	**8 HOURS**

Arrays and Pointers: Array Manipulation; Searching, Insertion, Deletion of an Element from an one dimensional Array; Finding the Largest/Smallest Element in an Array; Two Dimensional Arrays, Addition/Multiplication of

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SEMESTER-I

COURSE CODE	CATEGORY	COURSE NAME	TEACHING & EVALUATION SCHEME					L	T	P	CREDITS
			THEORY			PRACTICAL					
			END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*				
BTCS107M	SEC	Program Development using C	0	0	0	30	20	0	0	2	1

Legends: **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** – Practical; **C** - Credit; ***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Two Matrices, Transpose of a Square Matrix, Address Operators, Pointer Type Declaration, Pointer Assignment, Pointer Initialization, Pointer Arithmetic, Pointer Arrays.

UNIT IV — **7 HOURS**

Functions: Modular Programming and Functions, Prototype of a Function: Parameter List, Return Type, Function Call, Block Structure, Call by Reference, Call by Value, Recursive Functions and Arrays as Function Arguments

UNIT V — **8 HOURS**

Structure: Structure Variables, Initialization, Structure Assignment, Structures and Arrays: Arrays of Structures.

TEXTBOOKS:

1. Gottfried BS – Programming with C, TMH publications.
2. David Griffiths**, "**Head First C: A Brain-Friendly Guide**"** O Reilly Media Inc. 2011.

REFERENCE:

1. Allen B. Tucker, "Programming Languages", Tata McGraw Hill.
2. Tennence W. Pratt, "Programming languages design and implementation", Prentice Hall of India.
3. Herbert Schildt "C: Complete Reference", Tata McGraw Hill 2000.
4. Yashwant Kanetkar, "Let us C", BPB Publication, 16th Edition 2018.
5. Fundamentals of Programming Languages, R. Bangia, Cyber Tech.
6. Greg Perry and Dean Miller, "C Programming Absolute Beginner's Guide 3rd Edition", Que Publishing 2013.

LIST OF PRACTICALS

1. Write a C program to display "This is my first C Program".
2. Write a C program to calculate area and circumference of a circle.
3. Write a C program to perform addition, subtraction, division and multiplication of two numbers.
4. Write a program to calculate simple and compound interest.
5. Write a program to swap values of two variables with and without using third variable.
6. Write a program to display the size of every data type using "size of" operator.
7. Write a program to illustrate the use of unary prefix and postfix increment and decrement operators.
8. Write a program to input two numbers and display the maximum number.
9. Write a program to find the largest of three numbers using ternary operators.
10. Write a program to find the roots of quadratic equation.
11. Write a program to input name, marks of 5 subjects of a student and display the name of the student, the total

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	marks scored, percentage scored and the class of result.
12.	Write a Program to Check Whether a Number is Prime or not.
13.	Write a program to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd.
14	Write a program to find the factorial of a number.
15.	Write a program to check number is Armstrong or not.(Hint: A number is Armstrong if the sum of cubes of individual digits of a number is equal to the number itself).
16.	Write a program to check whether a number is Palindrome or not
17.	Write a program to generate Fibonacci series.
18.	Write a program to find GCD (greatest common divisor or HCF) and LCM (least common multiple) of two numbers.
19.	Write a Program to Search an element in array.
20.	Write a Program to perform addition of all elements in Array.
21.	Write a Program to find the largest and smallest element in Array.
22.	Write a Program for deletion of an element from the specified location from Array.
23.	Write a Program to access an element in 2-D Array.
24.	Write a program for addition of two matrices of any order in C.
25.	Write a Program to multiply two 3 X 3 Matrices.
26.	Write a program to add, subtract, multiply and divide two integers using user-defined type function with return type.
27.	Write a program to generate Fibonacci series using recursive function.
28.	Write a program to find the sum of all the elements of an array using pointers.
29.	Write a program to swap value of two variables using pointer.
30	Write a program to add two numbers using pointers.
31	Write a program to input and print array elements using pointer.
32	Write a program to create a structure named company which has name, address, phone and Of Employee as member variables. Read name of company, its address, phone and non-employee. Finally display this member's value.
33	Write a program to read Roll No, Name, Address, Age & average-marks of 12 students in the BCT class and display the details from function.
34	Write a program to add two distances in feet and inches using structure.

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BTIBM108N	DC	Problem Solving with Programming	0	0	0	30	20	0	0	2	1

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COURSE OBJECTIVES:	
The student will have ability to:	
1.	To gain foundational knowledge of software development concepts, programming paradigms, and essential tools used in modern software engineering.
2.	To ddevelop strong programming fundamentals by learning variables, data types, control structures, functions, and basic algorithms through hands-on coding practice.
3.	To understand and apply the principles of object-oriented programming (OOP), including classes, objects, inheritance, polymorphism, and encapsulation.
4.	To build problem-solving abilities by working with fundamental data structures, algorithms, and software development best practices such as version control, clean coding, documentation, and testing.

COURSE OUTCOMES:	
Upon completion of the subject, students will be able to:	
1.	Explain the fundamentals of software development, programming paradigms, and the software development lifecycle, including essential tools and environments.
2.	Apply core programming concepts such as variables, data types, operators, control structures, loops, functions, and basic algorithms to develop simple software programs.
3.	Develop object-oriented solutions by designing and implementing classes and objects, applying concepts like inheritance, polymorphism, and encapsulation.
4.	Demonstrate good software development practices including code documentation, version control, testing techniques, clean coding principles, and basic project collaboration tools.

SYLLABUS

UNIT I	**6 HOURS**
Introduction to Software Development: Get introduced to the world of software development and gain an understanding of the software development lifecycle. Explore different programming paradigms and learn about essential tools and technologies used in software development.	
UNIT II	**8 HOURS**
Programming Fundamentals: Dive into the core concepts of programming and learn the fundamentals of writing code. Explore variables, data types, control structures, functions, and basic algorithms. Develop your problem-solving skills through hands-on coding exercises.	
UNIT III	**8 HOURS**

Chairperson **Chairperson** **Controller of Examination** **Registrar**

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Introduction to Object-Oriented Programming: Explore the principles of object-oriented programming (OOPs) and learn how to design and implement classes and objects. Understand concepts like inheritance, polymorphism, and encapsulation. Develop object-oriented programs through handson coding projects.

UNIT IV	**6 HOURS**

Introduction to Data Structures and Algorithms: Introduce yourself to common data structures and algorithms used in software development. Learn about arrays, linked lists, stacks, queues, and basic sorting and searching algorithms. Analyze the efficiency and performance of algorithms.

UNIT V	**4 HOURS**

Software Development Practices: Learn about software development best practices, including code documentation, version control, and testing. Understand the importance of clean coding practices and code refactoring. Gain insights into collaborative development and project management tools.

TEXTBOOKS:

1.	Gottfried BS – Programming with C, TMH publications.
2.	Robert Lafore; Object oriented programming in C++ ; Fourth edition ; Pearson publication;2002 .
3.	Ashok N. Kamthane, Introduction to Data structures, 2nd Ed., Pearson Education India, 2011
4.	Roger S. Pressman, Software Engineering - A practitioner's Approach, 6th Ed., McGraw Hill International Edition.

REFERENCE:

1.	Yashwant Kanetkar, "Let us C", BPB Publication, 16th Edition 2018.
2.	E Balagurusamy; Object oriented programming with C++; Seven edition; TMH; 2017.
3.	E. Balagurusamy, Data Structure Using C, Tata McGraw-Hill 2017.
4.	Waman S Jawadekar, Software Engineering principles and practice, The McGraw-Hill Companies.

LIST OF PRACTICALS

1.	Understand development environment setup and basic syntax.
2.	Apply basic programming concepts (data types, operators).
3.	Implement decision-making constructs.
4.	Use loops to solve practical problems.
5.	Develop modular code using functions.
6.	Understand class structure and object creation.
7.	Apply OOP principles.

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BTIBM108N	**DC**	**Problem Solving with Programming**	0	0	0	30	20	0	0	2	1

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8.	Apply OOP principles.
9.	Work with linear data structures.
10.	Understand algorithmic implementation and complexity.
11.	Apply simple testing methods.