BACHELOR IN COMPUTER APPLICATION

PROGRAMME OUTCOMES

The outcomes of a Bachelor of Computer Applications (BCA) course typically vary depending on the specific curriculum and focus of the program offered by different educational institutions. However, here are some common program outcomes that are often associated with BCA courses:

- Graduates should possess a strong foundation in various technical skills related to computer applications, including programming languages such as Java, C++, Python, etc., as well as database management, web development, software engineering, and networking.
- BCA graduates should be equipped with problem-solving abilities and analytical thinking skills to effectively address challenges encountered in the field of computer applications.
- Students should be capable of designing, developing, and implementing software solutions for diverse computing needs, including standalone applications, web-based systems, mobile applications, and more.
- Understanding of database management systems (DBMS) and proficiency in designing, implementing, and managing databases using platforms such as MySQL, Oracle, SQL Server, etc.
- Competence in developing dynamic and interactive websites using technologies such as HTML, CSS, JavaScript, PHP, ASP.NET, etc., and understanding of web frameworks and content management systems (CMS), Networking concepts.

COURSE OUTCOMES

BCA-SEM1

1. Introduction to Programming - C

- Understand and use the program development lifecycle and can employ various tools for it.
- Develop the program logic to solve simple and complex problems.
- Use various programming constructs of C like branching, looping and arrays.
- Deploy the pointers for memory management.

2. Introduction to Computer and Information Technology

- Upon completing the course, students will acquire a comprehensive understanding of computer systems, covering hardware milestones, software developments, and practical applications in various domains. Proficiency in interacting with computers using input devices, managing output devices, and grasping data storage technologies will be emphasized.

- Additionally, mastery of MS-Word for document creation, formatting, and editing, along with adept use of MS-PowerPoint for engaging presentations, will be attained.
- This skill set positions graduates for diverse employment opportunities.
- They can explore roles in IT support, data entry and management, office administration, customer support, technology consulting, data storage and management, and training and education.
- The course equips students with the necessary knowledge and skills to excel in a range of fields where computer applications play a crucial role, ensuring their readiness for dynamic career paths in today's technology-driven landscape.

3. Applied & Discrete Mathematics

- Learn about Sets, its properties and various applications
- Learn about Relations, its properties and various applications
- Learn about Logic, its properties and various applications
- Learn about Boolean algebra, its properties and various applications
- Learn about Matrices, its properties and various applications

4. Communication Skills in English – I

- To enhance the vocabulary and pronunciation of the students.
- How to write resume in an effective and proper way.
- To enhance their reading skills
- To teach business ethics.
- To learn note taking style

5. Punjabi

- ਪੁਸਤਕ 'ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ' ਵਿਚਲੇ ਕਵਿਤਾ ਅਤੇ ਕਹਾਣੀ ਭਾਗ ਦੇ ਵਿਭਿੰਨ ਆਧੁਨਿਕ ਕਵੀਆਂ ਤੇ ਕਹਾਣੀਕਾਰਾਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਦੇ ਪਾਠ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਵਧੇਰੇ ਸਾਹਿਤ ਪੜ੍ਹਨ ਅਤੇ ਲਿਖਣ ਦੀ ਚਿਣਗ ਪੈਦਾ ਹੁੰਦੀ ਹੈ। ਇਹਨਾਂ ਕਵਿਤਾਵਾਂ ਅਤੇ ਕਹਾਣੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਮਨੁੱਖੀ ਮਨ ਦੇ ਵਿਭਿੰਨ ਪੱਖਾਂ-ਪਾਸਾਰਾਂ ਨੂੰ ਸਮਝਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੁੰਦੀ ਹੈ।
- 'ਇਤਿਹਾਸਕ ਯਾਦਾਂ' ਪੁਸਤਕ ਵਿਚ ਭਾਰਤ ਦੀਆਂ ਮਹਾਨ ਰਾਜਨੀਤਿਕ, ਸਾਹਿਤਕ ਅਤੇ ਧਾਰਮਿਕ ਸ਼ਖ਼ਸੀਅਤਾਂ ਦੇ ਲਿਖੇ ਹੋਏ ਸੰਸਮਰਨ ਸ਼ਾਮਲ ਹਨ ਜੋ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਰਤ ਦੀ ਅਜ਼ਾਦੀ ਤੋਂ ਪਹਿਲਾਂ ਵਾਲ਼ੇ ਸਮੇਂ ਦੀਆਂ ਵੱਖ-ਵੱਖ ਇਤਿਹਾਸਕ ਘਟਨਾਵਾਂ ਅਤੇ ਲਹਿਰਾਂ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਂਦੀ ਹੈ। ਅਜਿਹਾ ਗਿਆਨ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਜਿੱਥੇ ਅਜ਼ਾਦੀ ਘੋਲਾਂ ਸੰਬੰਧੀ ਬਹੁਤ ਮਹੱਤਵਪੂਰਨ ਤੱਥਕ ਜਾਣਕਾਰੀ ਦਾ ਸਰੋਤ ਬਣਦਾ ਹੈ ਉੱਥੇ ਹੀ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਦੇਸ ਸੇਵਾ ਦੀ ਭਾਵਨਾ ਵੀ ਪੈਦਾ ਕਰਦਾ ਹੈ।
- ਪੈਰ੍ਹਾ ਰਚਨਾ ਅਤੇ ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇ ਅਭਿਆਸ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਪੜ੍ਹਨ ਤੇ ਲਿਖਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੋਣ ਦੇ ਨਾਲ਼ ਨਾਲ਼ ਸਿਰਜਣਾਤਮਿਕ ਰੁਚੀਆਂ ਵੀ ਵਿਕਸਿਤ ਹੁੰਦੀਆਂ ਹਨ।
- ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਟਕਸਾਲੀ ਭਾਸ਼ਾ, ਭਾਸ਼ਾ ਤੇ ਬੋਲੀ ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ ਅਤੇ ਪੰਜਾਬੀ ਦੀਆਂ ਵਿਭਿੰਨ ਉਪ ਭਾਸ਼ਾਵਾਂ ਦੀ ਪਛਾਣ ਕਰਨ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੁੰਦੀ ਹੈ। ਇਸਤੋਂ ਇਲਾਵਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਜਨਮ ਅਤੇ ਵੱਖ-ਵੱਖ ਵਿਕਾਸ ਪੜਾਵਾਂ ਦੀ ਜਾਣਕਾਰੀ ਮਿਲਦੀ ਹੈ।

5A. Basic Punjabi

- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਪੜ੍ਹਨ ਤੇ ਲਿਖਣ ਦਾ ਗਿਆਨ ਹੁੰਦਾ ਹੈ।
- ਪੰਜਾਬੀ ਸਾਹਿਤ ਬਾਰੇ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਹੁੰਦੀ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਮਾਤ੍ਰਾਵਾਂ ਦੀ ਵਰਤੋਂ ਦਾ ਗਿਆਨ ਹੁੰਦਾ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਭਾਸ਼ਾਈ ਯੋਗਤਾ ਵਿਕਸਿਤ ਹੁੰਦੀ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਸ਼ਾ ਦੀ ਮੁੱਢਲੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੁੰਦਾ ਹੈ।

5B. Punjab History & Culture

- Understand the region's river, like the Indus, influenced settlement patterns, agricultural practices and trade routes, invasions, migrations and the formation of civilizations can provide insights into the historical development of the Punjab.
- Understand the various historical sources, including archaeological findings, inscriptions and ancient texts to reconstruct the past accurately.
- Understanding urban planning, efficient drainage system, multi-story buildings, artifacts, Agriculture, advanced irrigation system, crafts, including pottery and metal work.
- Understanding the migration patterns and settlements of the Indo-Aryans into the Indian Subcontinent.
- Understanding the dynamic changes in social & economic life during the Rigvedic and Later Rigvedic Periods.
- Both Buddhism & Jainism left a lasting impact on the cultural, moral & artistic landscape of Punjab. The teaching of compassion, non-violence & ethical conduct from these traditions contributed to the broader philosophical and religious diversity of the region.
- The remnants of Buddhism and Jain archaeological sites in Punjab bear witness to the historical presence and influence of these ancient Indian religions.

<u>BCA - SemII</u>

1. Introduction to Programming – C++

- Building logics for solving problems in C++ language by analyzing data types, keywords etc.
- Creating programs or applications to solve real world problems using an object-oriented approach.
- Solving complex mathematical and scientific problems with the use of C++language.
- Writing reusable code or functions in C++ language, which in turn will increase the program efficiency.
- Able to implement techniques like inheritance, polymorphism, method overloading, etc for program construction.

2. Principles of Digital Electronics

- Understand the conversions among different number systems, binary arithmetic, signed binary numbers using 1's and 2's complement, different binary codes and floating-point representations and their implementations in digital design.
- Acquire the knowledge regarding minimization techniques using logic gates, boolean algebra, canonical forms, and K maps for effective and economical designs of digital circuits.
- Understand and design various combinational circuits such as, Adder, subtractor, Multiplexer, Demultiplexer, encoder, decoder, and sequential circuits such as Flip flops, registers & counter and propose a cost-effective solution in digital world.
- Be able to examine the functions of different semiconductor memories such as static and dynamic, memory chips, PROM, EPROM, RAM with timing diagrams for effective digital designs.

3. Numerical Methods & Statistical Techniques

- Enable to get the numerical solution of algebraic, transcendental and system of linear equations
- Enable to find the missing data points form the given data using interpolation and extrapolation.
- Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. Apply numerical methods to obtain approximate solutions to mathematical problems.

4. Communication Skills in English – II

- How to scan the text to find the main idea and to find specific information.
- To use their notes to organize their ideas.
- To make the students converse confidently and fluently.
- How to analyze and synthesize information presented in different sources.

5. Punjabi

- ਪੁਸਤਕ 'ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ' ਦਾ ਦੂਜਾ ਭਾਗ ਪੰਜਾਬੀ ਵਾਰਤਕ ਸਾਹਿਤ ਦੀਆਂ ਵਿਧਾਵਾਂ ਨਿਬੰਧ ਤੇ ਰੇਖਾ ਚਿੱਤਰ ਨਾਲ਼ ਸੰਬੰਧਿਤ ਹੈ ਜਿਸ ਵਿਚ ਪੰਜਾਬੀ ਦੇ ਪ੍ਰਮੁੱਖ ਵਾਰਤਕਕਾਰਾਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਸ਼ਾਮਲ ਹਨ। ਇਹਨਾਂ ਰਚਨਾਵਾਂ ਦਾ ਪਾਠ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਪੰਜਾਬੀ ਵਾਰਤਕ ਸੰਬੰਧੀ ਵਿਧਾਗਤ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਕਰਨ ਦੇ ਨਾਲ਼-ਨਾਲ਼ ਉਹਨਾਂ ਦੀ ਬੌਧਿਕ ਸੂਝ ਨੂੰ ਵੀ ਪ੍ਰਫੁਲਿਤ ਕਰਦਾ ਹੈ।
- 'ਇਤਿਹਾਸਕ ਯਾਦਾਂ' ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਭਾਗ ਵਿਚ ਅੰਗਰੇਜ਼ੀ ਰਾਜ ਸਮੇਂ ਹੋਈਆਂ ਕੁਝ ਮਹੱਤਵਪੂਰਨ ਘਟਨਾਵਾਂ ਜਿਵੇਂ ਸਾਕਾ ਨਨਕਾਣਾ ਸਾਹਿਬ ਆਦਿ ਦੀ ਵਿਸਤ੍ਰਿਤ ਜਾਣਕਾਰੀ ਦਰਜ ਹੈ। ਭਾਰਤ ਤੋਂ ਇਲਾਵਾ ਕੁਝ ਹੋਰ ਦੇਸਾਂ ਜਿਵੇਂ ਜਾਪਾਨ ਤੇ ਅਫ਼ਗਾਨਿਸਤਾਨ ਆਦਿ ਦੇ ਸਬੰਧਾਂ ਅਤੇ ਇਤਿਹਾਸ ਬਾਰੇ ਵੀ ਜਾਣਕਾਰੀ ਮਿਲ਼ਦੀ ਹੈ। ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਅਜਿਹੀ ਜਾਣਕਾਰੀ ਦਾ ਪਸਾਰ ਉਹਨਾਂ ਅੰਦਰ ਆਪਣੇ ਦੇਸ ਪ੍ਰਤੀ ਵਧੇਰੇ ਜ਼ਿੰਮੇਵਾਰ ਨਾਗਰਿਕ ਬਣਾਉਂਦਾ ਹੈ

- ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਭਾਸ਼ਾ ਸਮਰਥਾ ਵਿਚ ਵਾਧਾ ਹੋਣ ਦੇ ਨਾਲ਼-ਨਾਲ਼ ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ ਦੇ ਮੁੱਢਲੇ ਸੰਕਲਪਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਲ ਹੁੰਦੀ ਹੈ ਅਤੇ ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਦੇ ਮੁਢਲੇ ਨਿਯਮਾਂ ਦੀ ਜਾਣਕਾਰੀ ਮਿਲ਼ਦੀ ਹੈ।
- ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਨੂੰ ਸਮਝਣ ਨਾਲ਼ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਦਫ਼ਤਰੀ ਕੰਮਕਾਜ ਕਰਾਉਣ ਲਈ ਲੋੜੀਂਦੇ ਪੱਤਰ ਵਿਹਾਰ ਵਿਚ ਸਹਾਇਤਾ ਮਿਲ਼ਦੀ ਹੈ। ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰਿਆਂ ਦੇ ਅਧਿਅਨ ਅਤੇ ਅਭਿਆਸ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਭਾਸ਼ਾ ਸਮਰਥਾ ਵਿਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ।

5A. Basic Punjabi

- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਸ਼ਾ ਦੀ ਅੰਦਰੂਨੀ ਬਣਤਰ ਸੰਬੰਧੀ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੁੰਦਾ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੋਚਣ ਸ਼ਕਤੀ ਵਿਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ।
- ਵਿਦਿਆਰਥੀ ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਦਾ ਗਹਿਨ ਅਧਿਅਨ ਕਰਨ ਦੇ ਕਾਬਲ ਹੁੰਦੇ ਹਨ।
- ਵਿਦਿਆਰਥੀ ਵਿਆਕਰਨਕ ਨੇਮ ਵਿਧਾਨਾਂ ਤੋਂ ਜਾਣੂ ਹੁੰਦੇ ਹਨ।
- ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸਾਹਿਤ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਵਧਦੀ ਹੈ ਅਤੇ ਉਹ ਸਮਾਜ ਨੂੰ ਚੰਗੀ ਸੋਚ ਦੇਣ ਦੇ ਸਮਰੱਥ ਹੁੰਦੇ ਹਨ।

5B. Punjab History & Culture

- Understanding the Alexander's conquests led to the creation of the largest empires in history, the spread of Greek culture, art, architecture, philosophy & language.
- Understanding the influence of Mauryan rule, especially during the reign of Ashoka, contributed to the cultural, economic and administrative development of the region.
- Understanding the Kushans, through their interaction and rule, left a lasting imprints on Punjab's cultural, religious and economic landscape.
- Understanding the impact of political stability, economic prosperity, cultural flourishing & a period of relative peace and progress under the Gupta Empire on Punjab.
- Understanding the Vardhana Empire who ruled over the northern regions, figures, social structures and Hindu religion practices.
- Understanding the development and consolidation of distinct socio-cultural identities within the diverse population of Punjab.
- Provide the comprehensive perspective on the development of language and education in Taxila, offering insight into the intellectual vibrancy and academic pursuits of this ancient educational centre.
- Understanding the frame work for comprehensively studying the development of art , architecture, multidimensional nature of these creative endeavors and their impact on societies.

BCA - Sem III

1. Computer Architecture

- Understand and use program development life cycle and can employ various tools for it.
- Develop the program logic to solve simple and complex problems.

- Use various programming constructs of C like branching, looping and arrays.
- Deploy the pointers for memory management.

2. Database Management System

- Students will develop comprehensive skills in database management, covering fundamental concepts, SQL operations, database administration responsibilities, and advanced topics like normalization and triggers.
- Students will be proficient in using advanced SQL features for database manipulation, including complex queries, joins, sub queries, set operations, views, and security mechanisms.
- Students will gain competence in database administration tasks, including concurrency control, protection, security, and recovery.
- Students will understand the challenges and opportunities presented by Big Data and gain an introduction to No SQL databases, preparing them for the evolving landscape of data management.

3. Introduction to Python Programming

- Students will develop comprehensive skills in Python programming, covering fundamental concepts, control structures, functions, file handling, string processing, exception handling, object-oriented programming, and database handling.
- Students will be able to apply Python for computational problem-solving, data manipulation, and real-time projects involving object-oriented programming and database interactions.
- Students will gain proficiency in using Python libraries and modules for efficient and modular programming, supporting top-down design principles.
- Students will be well-equipped to interact with databases using Python, enabling them to perform tasks such as creating tables, querying data, and implementing data modeling.

<u>BCA- Sem IV</u>

1. Data Structures and File Processing

- Students will understand the theory and architecture of the central processing unit.
- Analyze some of the design issues in terms of speed, technology, and cost.
- Apply the knowledge of combinational and sequential logical circuits to design computer architecture.
- Understand the input/output and Memory related concepts.

2. Information Systems

- Students will develop a deep understanding of information systems, their types, and their development life cycle.

- Students will gain practical knowledge of capturing, converting, and accessing information in the digital era, along with insights into various types of information systems.
- Students will be equipped with the knowledge of how MIS and DSS contribute to decision-making processes in organizations.
- Students will develop skills in analyzing and understanding real-world case studies of information systems, allowing them to apply theoretical concepts to practical scenarios.

3. Internet Applications

- Building logics for solving problems in C++ language by analyzing data types, keywords etc.
- Creating programs or applications to solve real world problems using an object-oriented approach.
- Solving complex mathematical and scientific problems with the use of C++ language.
- Writing reusable code or functions in C++ language, which in turn will increase the program efficiency.
- Able to implement techniques like inheritance, polymorphism, method overloading, etc for program construction.

4. System Software

- Students will gain a comprehensive understanding of system software, including its evolution and components.
- They will be familiar with translators, loaders, interpreters, compilers, and assemblers, and their roles in software development.
- Understanding macro processors and compilers will enable students to enhance their programming and software development skills.
- Knowledge of loaders, linkage editors, and other system software will provide a holistic view of the system-level components in the computing environment.

BCA- Sem V

1. Software Engineering

- A comprehensive understanding of software engineering principles and practices.
- They will possess the skills necessary for roles in software development, project management, quality assurance, and system maintenance.
- The course prepares students for industry-relevant challenges and fosters adaptability to different software development methodologies.
- Graduates will get opportunities in industries such as [illegible], software consulting, and product development.

2. Web Technologies

- Students will understand the theory and architecture of the central processing unit.
- Analyze some of the design issues in terms of speed, technology, and cost.
- Apply the knowledge of combinational and sequential logical circuits to design computer architecture.
- Understand the input/output and Memory related concepts.

3. Operating System

- Students will understand the theory and architecture of the central processing unit.
- Analyze some of the design issues in terms of speed, technology, and cost.
- Apply the knowledge of combinational and sequential logical circuits to design computer architecture.
- Understand the input/output and Memory related concepts.

4. Java Programming Language

- Gain a comprehensive understanding of web development fundamentals, including the distinction between static and dynamic websites, server-side and client-side scripting, and HTML5, CSS3, and JavaScript essentials
- Acquire proficiency in PHP for web development, covering data types, variables, control statements, functions, file handling, sessions, cookies, error handling, and MySQL database connectivity
- Explore the intricacies of web hosting, SSL certificates, and the step-by-step process of hosting a website online.
- Delve into emerging web technologies, including Chatbots, Artificial Intelligence, Machine Learning, Internet of Things (IoT), Blockchain, Augmented Reality, Virtual Reality, and Single Page Applications using Angular, expanding your knowledge of cutting-edge tools and trends in web development.

BCA- Sem VI

1. Computer Graphics

- Gain a comprehensive understanding of computer graphics and its wide-ranging applications in various fields.
- Understand different display devices, including CRT Monitors, DVST, Plasma-Panel Display, LED, and LCD Monitors.
- Develop proficiency in basic drawing techniques and algorithms.
- Acquire knowledge of basic 2D and 3D transformations and their matrix representations.

2. Computer Networks

- Students will acquire a strong foundation in the principles and components of computer networks.
- They will understand the different types of networks, transmission media, and network architectures.
- Students will be equipped to design and implement data link layer protocols, analyze network security, and deploy network services effectively.
- The course aims to prepare students for roles in network administration, security, and communication.

3. Project

- Working on real projects develops hands-on experience, improving proficiency.
- Helps to foster critical thinking and problem solving techniques.
- A valuable addition to a student's portfolio, showcasing their abilities to potential employers.
- Align with industry, making students more attuned to current trends and demands.

BACHELOR OF INFORMATION TECHNOLOGY

PROGRAMME OUTCOMES

The program outcomes of a Bachelor of Science (BSc) in Information Technology (IT);

- Graduates should have a solid understanding of core IT concepts, including programming languages, database management, networking principles, and systems analysis and design.
- Graduates should be able to apply critical thinking and problem-solving skills to identify and solve IT-related problems efficiently and effectively.
- Graduates should be capable of managing and organizing information effectively, including data storage, retrieval.
- It also covers the concepts of E-Banking, E-Retailing, online reservation, online shopping.
- It covers the concepts of software engineering and development of projects in various fields.

COURSE OUTCOMES

B.Sc (IT)- Sem 1

1. Fundamentals of Computers

- Upon completing the course, students will acquire a comprehensive understanding of computer systems, covering hardware milestones, software developments, and practical applications in various domains. Proficiency in interacting with computers using input devices, managing output devices, and grasping data storage technologies will be emphasized.
- Additionally, mastery of MS-Word for document creation, formatting, and editing, along with adept use of MS-PowerPoint for engaging presentations, will be attained.
- This skill set positions graduates for diverse employment opportunities.
- They can explore roles in IT support, data entry and management, office administration, customer support, technology consulting, data storage and management, and training and education.
- The course equips students with the necessary knowledge and skills to excel in a range of fields where computer applications play a crucial role, ensuring their readiness for dynamic career paths in today's technology-driven landscape.

2. Introduction to Programming - C

- Under standard use program development life cycle and can employ various tools for it.
- Develop the program logic to solve simple and complex problems.
- Use various programming constructs of C like branching, looping and arrays.

- Deploy the pointers for memory management.

3. Applied and Discrete Mathematics

- Upon completing the course, students will acquire a comprehensive understanding of computer systems, covering hardware milestones, software developments, and practical applications in various domains. Proficiency in interacting with computers using input devices, managing output devices, and grasping data storage technologies will be emphasized.
- The course equips students with the necessary knowledge and skills to excel in a range of fields where computer applications play a crucial role, ensuring their readiness for dynamic career paths in today's technology-driven landscape.

4. Communication Skills in English – I

- To enhance the vocabulary and pronunciation of the students.
- How to write resume in an effective and proper way.
- To enhance their reading skills
- To teach business ethics.
- To learn note taking style

5. Punjabi

- ਪੁਸਤਕ 'ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ' ਵਿਚਲੇ ਕਵਿਤਾ ਅਤੇ ਕਹਾਣੀ ਭਾਗ ਦੇ ਵਿਭਿੰਨ ਆਧੁਨਿਕ ਕਵੀਆਂ ਤੇ ਕਹਾਣੀਕਾਰਾਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਦੇ ਪਾਠ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਵਧੇਰੇ ਸਾਹਿਤ ਪੜ੍ਹਨ ਅਤੇ ਲਿਖਣ ਦੀ ਚਿਣਗ ਪੈਦਾ ਹੁੰਦੀ ਹੈ। ਇਹਨਾਂ ਕਵਿਤਾਵਾਂ ਅਤੇ ਕਹਾਣੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਮਨੁੱਖੀ ਮਨ ਦੇ ਵਿਭਿੰਨ ਪੱਖਾਂ-ਪਾਸਾਰਾਂ ਨੂੰ ਸਮਝਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੁੰਦੀ ਹੈ।
- 'ਇਤਿਹਾਸਕ ਯਾਦਾਂ' ਪੁਸਤਕ ਵਿਚ ਭਾਰਤ ਦੀਆਂ ਮਹਾਨ ਰਾਜਨੀਤਿਕ, ਸਾਹਿਤਕ ਅਤੇ ਧਾਰਮਿਕ ਸ਼ਖ਼ਸੀਅਤਾਂ ਦੇ ਲਿਖੇ ਹੋਏ ਸੰਸਮਰਨ ਸ਼ਾਮਲ ਹਨ ਜੋ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਰਤ ਦੀ ਅਜ਼ਾਦੀ ਤੋਂ ਪਹਿਲਾਂ ਵਾਲ਼ੇ ਸਮੇਂ ਦੀਆਂ ਵੱਖ-ਵੱਖ ਇਤਿਹਾਸਕ ਘਟਨਾਵਾਂ ਅਤੇ ਲਹਿਰਾਂ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਂਦੀ ਹੈ। ਅਜਿਹਾ ਗਿਆਨ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਜਿੱਥੇ ਅਜ਼ਾਦੀ ਘੋਲਾਂ ਸੰਬੰਧੀ ਬਹੁਤ ਮਹੱਤਵਪੂਰਨ ਤੱਥਕ ਜਾਣਕਾਰੀ ਦਾ ਸਰੋਤ ਬਣਦਾ ਹੈ ਉੱਥੇ ਹੀ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਦੇਸ ਸੇਵਾ ਦੀ ਭਾਵਨਾ ਵੀ ਪੈਦਾ ਕਰਦਾ ਹੈ।
- ਪੈਰ੍ਹਾ ਰਚਨਾ ਅਤੇ ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇ ਅਭਿਆਸ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਪੜ੍ਹਨ ਤੇ ਲਿਖਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੋਣ ਦੇ ਨਾਲ਼ ਨਾਲ਼ ਸਿਰਜਣਾਤਮਿਕ ਰੁਚੀਆਂ ਵੀ ਵਿਕਸਿਤ ਹੁੰਦੀਆਂ ਹਨ।
- ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਟਕਸਾਲੀ ਭਾਸ਼ਾ, ਭਾਸ਼ਾ ਤੇ ਉਪ ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ ਅਤੇ ਪੰਜਾਬੀ ਦੀਆਂ ਵਿਭਿੰਨ ਉਪ ਭਾਸ਼ਾਵਾਂ ਦੀ ਪਛਾਣ ਕਰਨ ਦੀ ਸਮਝ ਵਿਕਸਿਤ ਹੁੰਦੀ ਹੈ। ਇਸਤੋਂ ਇਲਾਵਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਜਨਮ ਅਤੇ ਵੱਖ-ਵੱਖ ਵਿਕਾਸ ਪੜਾਵਾਂ ਦੀ ਜਾਣਕਾਰੀ ਮਿਲ਼ਦੀ ਹੈ।

5A. Basic Punjabi

- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਪੜ੍ਹਨ ਤੇ ਲਿਖਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੋਵੇ।
- ਪੰਜਾਬੀ ਸਾਹਿਤ ਬਾਰੇ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਹੁੰਦੀ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਮਾਤ੍ਰਾਵਾਂ ਦੀ ਵਰਤੋਂ ਦਾ ਗਿਆਨ ਹੋਵੇ।
- ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਭਾਸ਼ਾਈ ਯੋਗਤਾ ਵਿਕਸਿਤ ਹੁੰਦੀ ਹੈ।

- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਸ਼ਾ ਦੀ ਮੁੱਢਲੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੁੰਦਾ ਹੈ।

5B. Punjab History & Culture

- Understand the region's river, like the Indus, influenced settlement patterns, agricultural practices and trade routes, invasions, migrations and the formation of civilizations can provide insights into the historical development of the Punjab.
- Understand the various historical sources, including archaeological findings, inscriptions and ancient texts to reconstruct the past accurately.
- Understanding urban planning, efficient drainage system, multi-story buildings, artifacts, Agriculture, advanced irrigation system, crafts, including pottery and metal work.
- Understanding the migration patterns and settlements of the Indo-Aryans into the Indian Subcontinent.
- Understanding the dynamic changes in social & economic life during the Rigvedic and Later Rigvedic Periods.
- Both Buddhism & Jainism left a lasting impact on the cultural, moral & artistic landscape of Punjab. The teaching of compassion, non-violence & ethical conduct from these traditions contributed to the broader philosophical and religious diversity of the region.
- The remnants of Buddhism and Jain archaeological sites in Punjab bear witness to the historical presence and influence of these ancient Indian religions.

B.Sc (IT)-Sem I1

1. Communication Skills in English – II

- How to scan the text to find the main idea and to find specific information.
- To use their notes to organize their ideas.
- To make the students converse confidently and fluently.
- How to analyze and synthesize information presented in different sources.

2. Punjabi

- ਪੁਸਤਕ 'ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ' ਦਾ ਦੂਜਾ ਭਾਗ ਪੰਜਾਬੀ ਵਾਰਤਕ ਸਾਹਿਤ ਦੀਆਂ ਵਿਧਾਵਾਂ ਨਿਬੰਧ ਤੇ ਰੇਖਾ ਚਿੱਤਰ ਨਾਲ਼ ਸੰਬੰਧਿਤ ਹੈ ਜਿਸ ਵਿਚ ਪੰਜਾਬੀ ਦੇ ਪ੍ਰਮੁੱਖ ਵਾਰਤਕਕਾਰਾਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਸ਼ਾਮਲ ਹਨ। ਇਹਨਾਂ ਰਚਨਾਵਾਂ ਦਾ ਪਾਠ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਪੰਜਾਬੀ ਵਾਰਤਕ ਸੰਬੰਧੀ ਵਿਧਾਗਤ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਕਰਨ ਦੇ ਨਾਲ਼-ਨਾਲ਼ ਉਹਨਾਂ ਦੀ ਬੌਧਿਕ ਸੂਝ ਨੂੰ ਵੀ ਪ੍ਰਫੁਲਿਤ ਕਰਦਾ ਹੈ।
- 'ਇਤਿਹਾਸਕ ਯਾਦਾਂ' ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਭਾਗ ਵਿਚ ਅੰਗਰੇਜ਼ੀ ਰਾਜ ਸਮੇਂ ਹੋਈਆਂ ਕੁਝ ਮਹੱਤਵਪੂਰਨ ਘਟਨਾਵਾਂ ਜਿਵੇਂ ਸਾਕਾ ਨਨਕਾਣਾ ਸਾਹਿਬ ਆਦਿ ਦੀ ਵਿਸਤ੍ਰਿਤ ਜਾਣਕਾਰੀ ਦਰਜ ਹੈ। ਭਾਰਤ ਤੋਂ ਇਲਾਵਾ ਕੁਝ ਹੋਰ ਦੇਸਾਂ ਜਿਵੇਂ ਜਾਪਾਨ ਤੇ ਅਫ਼ਗਾਨਿਸਤਾਨ ਆਦਿ ਦੇ ਸਮਾਜ-ਸਭਿਆਚਾਰ ਬਾਰੇ ਵੀ ਜਾਣਕਾਰੀ ਮਿਲ਼ਦੀ ਹੈ। ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਅਜਿਹੀ ਜਾਣਕਾਰੀ ਦਾ ਪ੍ਰਸਾਰ ਉਹਨਾਂ ਨੂੰ ਆਪਣੇ ਦੇਸ ਪ੍ਰਤੀ ਵਧੇਰੇ ਜ਼ਿੰਮੇਵਾਰ ਨਾਗਰਿਕ ਬਣਾਉਂਦਾ ਹੈ

- ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਭਾਸ਼ਾ ਸਮਰਥਾ ਵਿਚ ਵਾਧਾ ਹੋਣ ਦੇ ਨਾਲ਼-ਨਾਲ਼ ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ ਦੇ ਮੁੱਢਲੇ ਸੰਕਲਪਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਲ ਹੁੰਦੀ ਹੈ ਅਤੇ ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਦੇ ਮੁਢਲੇ ਨਿਯਮਾਂ ਦੀ ਜਾਣਕਾਰੀ ਮਿਲ਼ਦੀ ਹੈ।
- ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਨੂੰ ਸਮਝਣ ਨਾਲ਼ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਦਫ਼ਤਰੀ ਕੰਮਕਾਜ ਕਰਾਉਣ ਲਈ ਲੋੜੀਂਦੇ ਪੱਤਰ ਵਿਹਾਰ ਵਿਚ ਸਹਾਇਤਾ ਮਿਲ਼ਦੀ ਹੈ। ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰਿਆਂ ਦੇ ਅਧਿਅਨ ਅਤੇ ਅਭਿਆਸ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਭਾਸ਼ਾ ਸਮਰਥਾ ਵਿਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ।

2A. Basic Punjabi

- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਸ਼ਾ ਦੀ ਅੰਦਰੂਨੀ ਬਣਤਰ ਸੰਬੰਧੀ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੁੰਦਾ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੋਚਣ ਸ਼ਕਤੀ ਵਿਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ।
- ਵਿਦਿਆਰਥੀ ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਦਾ ਗਹਿਨ ਅਧਿਅਨ ਕਰਨ ਦੇ ਕਾਬਲ ਹੁੰਦੇ ਹਨ।
- ਵਿਦਿਆਰਥੀ ਵਿਆਕਰਨਕ ਨੇਮ ਵਿਧਾਨਾਂ ਤੋਂ ਜਾਣੂ ਹੁੰਦੇ ਹਨ।
- ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸਾਹਿਤ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਵਧਦੀ ਹੈ ਅਤੇ ਉਹ ਸਮਾਜ ਨੂੰ ਚੰਗੀ ਸੋਚ ਦੇਣ ਦੇ ਸਮਰੱਥ ਹੁੰਦੇ ਹਨ।

2B. Punjab History & Culture

- Understanding the Alexander's conquests led to the creation of the largest empires in history, the spread of Greek culture, art, architecture, philosophy & language.
- Understanding the influence of Mauryan rule, especially during the reign of Ashoka, contributed to the cultural, economic and administrative development of the region.
- Understanding the Kushans, through their interaction and rule, left a lasting imprints on Punjab's cultural, religious and economic landscape.
- Understanding the impact of political stability, economic prosperity, cultural flourishing & a period of relative peace and progress under the Gupta Empire on Punjab.
- Understanding the Vardhana Empire who ruled over the northern regions, figures, social structures and Hindu religion practices.
- Understanding the development and consolidation of distinct socio-cultural identities within the diverse population of Punjab.
- Provide the comprehensive perspective on the development of language and education in Taxila, offering insight into the intellectual vibrancy and academic pursuits of this ancient educational centre.
- Understanding the frame work for comprehensively studying the development of art , architecture, multidimensional nature of these creative endeavors and their impact on societies.

3. Principles of Digital Electronics

- Enable to get the numerical solution of algebraic, transcendental and system of linear equations
- Enable to find the missing data points for the given data using interpolation and extrapolation.

- Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. Apply numerical methods to obtain approximate solutions to mathematical problems.

4. Introduction to Programming – C++

- Building logics for solving problems in C++ language by analyzing data types, keywords etc.
- Creating programs or applications to solve real world problems using an object-oriented approach.
- Solving complex mathematical and scientific problems with the use of C++ language.
- Writing reusable code or functions in C++ language, which in turn will increase the program efficiency.
- Able to implement techniques like inheritance, polymorphism, method overloading, etc for program construction.

5. Numerical Methods and Statistical Techniques

- Building logics for solving problems in C++ language by analyzing data types, keywords etc.
- Creating programs or applications to solve real world problems using an object-oriented approach.
- Solving complex mathematical and scientific problems with the use of C++ language.
- Writing reusable code or functions in C++ language, which in turn will increase the program efficiency.
- Able to implement techniques like inheritance, polymorphism, method overloading, etc for program construction.

B.Sc (IT) Sem III

1. Introduction to Python

- Students will develop comprehensive skills in database management, covering fundamental concepts, SQL operations, database administration responsibilities, and advanced topics like normalization and triggers.
- Students will be proficient in using advanced SQL features for database manipulation, including complex queries, joins, subqueries, set operations, views, and security mechanisms.
- Students will gain competence in database administration tasks, including concurrency control, protection, security, and recovery.
- Students will understand the challenges and opportunities presented by Big Data and gain an introduction to NoSQL databases, preparing them for the evolving landscape of data management.

2. Data Structure

- Students will develop comprehensive skills in Python programming, covering fundamental concepts, control structures, functions, file handling, string processing, exception handling, object-oriented programming, and database handling.
- Students will be able to apply Python for computational problem-solving, data manipulation, and real-time projects involving object-oriented programming and database interactions.
- Students will gain proficiency in using Python libraries and modules for efficient and modular programming, supporting top-down design principles.
- Students will be well-equipped to interact with databases using Python, enabling them to perform tasks such as creating tables, querying data, and implementing data modeling.

3. System Analysis and Design

- Upon completion of the course, students should have a solid understanding of fundamental data structures, their implementation, and their applications in various algorithms.
- To understand prefix, infix, and postfix expression formats.
- To understand the performance of the implementations of basic linear data structures.
- To understand the abstract data types stack, queue, deque, and list. To be able to recognize problem properties where stacks, queues, and deques are appropriate
- To be able to implement the abstract data type list as a linked list using the node and reference
- To understand and implement trees and graph data structures
- It will be valuable in both placement opportunities in software development roles, and offer practical skills applicable across various domains of computer science and programming.

B.Sc (IT) - Sem –IV

1. Database Management System

- Upon completion of the course, students should have a solid understanding of fundamental data structures, their implementation, and their applications in various algorithms.
- To understand prefix, infix, and postfix expression formats.
- To understand the performance of the implementations of basic linear data structures.
- To understand the abstract data types stack, queue, deque, and list. To be able to recognize problem properties where stacks, queues, and deques are appropriate
- To be able to implement the abstract data type list as a linked list using the node and reference

2. Internet Applications

- Building logics for solving problems in C++ language by analyzing data types, keywords etc.
- Creating programs or applications to solve real world problems using an object-oriented approach.
- Solving complex mathematical and scientific problems with the use of C++ language.
- Writing reusable code or functions in C++ language, which in turn will increase the program efficiency.
- Able to implement techniques like inheritance, polymorphism, method overloading, etc for program construction.

3. Java and Web Designing

- Gain a comprehensive understanding of web development fundamentals, including the distinction between static and dynamic websites, server-side and client-side scripting, and HTML5, CSS3, and JavaScript essentials
- Acquire proficiency in PHP for web development, covering data types, variables, control statements, functions, file handling, sessions, cookies, error handling, and MySQL database connectivity
- Explore the intricacies of web hosting, SSL certificates, and the step-by-step process of hosting a website online.
- Delve into emerging web technologies, including Chatbots, Artificial Intelligence, Machine Learning, Internet of Things (IoT), Blockchain, Augmented Reality, Virtual Reality, and Single Page Applications using Angular, expanding your knowledge of cutting-edge tools and trends in web development.

4. Web Technologies

- Gain a comprehensive understanding of computer graphics and its wide-ranging applications in various fields.
- Understand different display devices, including CRT Monitors, DVST, Plasma-Panel Display, LED, and LCD Monitors.
- Develop proficiency in basic drawing techniques and algorithms.
- Acquire knowledge of basic 2D and 3D transformations and their matrix representations.

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B.Sc (IT) - Sem –V

1. Computer Networks

- Gain a comprehensive understanding of computer graphics and its wide-ranging applications in various fields.
- Understand different display devices, including CRT Monitors, DVST, Plasma-Panel Display, LED, and LCD Monitors.

- Develop proficiency in basic drawing techniques and algorithms.
- Acquire knowledge of basic 2D and 3D transformations and their matrix representations.

2. Operating System

- Gain a comprehensive understanding of computer graphics and its wide-ranging applications in various fields.
- Understand different display devices, including CRT Monitors, DVST, Plasma-Panel Display, LED, and LCD Monitors.
- Develop proficiency in basic drawing techniques and algorithms.
- Acquire knowledge of basic 2D and 3D transformations and their matrix representations.

3. E- Business

- Gain a comprehensive understanding of computer graphics and its wide-ranging applications in various fields.
- Understand different display devices, including CRT Monitors, DVST, Plasma-Panel Display, LED, and LCD Monitors.
- Develop proficiency in basic drawing techniques and algorithms.
- Acquire knowledge of basic 2D and 3D transformations and their matrix representations.

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B.Sc (IT) - Sem –VI

1. Computer Graphics

- Gain a comprehensive understanding of computer graphics and its wide-ranging applications in various fields.
- Understand different display devices, including CRT Monitors, DVST, Plasma-Panel Display, LED, and LCD Monitors.
- Develop proficiency in basic drawing techniques and algorithms.
- Acquire knowledge of basic 2D and 3D transformations and their matrix representations.

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2. Project

- Gain a comprehensive understanding of web development fundamentals, including the distinction between static and dynamic websites, server-side and client-side scripting, and HTML5, CSS3, and JavaScript essentials
- Acquire proficiency in PHP for web development, covering data types, variables, control statements, functions, file handling, sessions, cookies, error handling, and MySQL database connectivity
- Explore the intricacies of web hosting, SSL certificates, and the step-by-step process of hosting a website online.
- Delve into emerging web technologies, including Chatbots, Artificial Intelligence, Machine Learning, Internet of Things (IoT), Blockchain, Augmented Reality.

B. DESIGN MULTIMEDIA

PROGRAMME OUTCOMES

- **Proficiency in Multimedia Tools**: Graduates will demonstrate proficiency in using industry-standard multimedia design software and tools for graphic design, web design, video editing, animation, and interactive media production.
- **Creative Expression**: Students will develop their creative abilities and demonstrate the capacity to generate innovative and aesthetically pleasing multimedia designs that effectively convey intended messages or narratives.
- **Critical Thinking and Problem-Solving**: Graduates will possess strong critical thinking skills and the ability to analyze design problems, identify user needs, and develop creative solutions that address those needs within multimedia contexts.
- **Visual Communication Skills**: Students will effectively communicate ideas, emotions, and information through visual means, utilizing principles of design, typography, color theory, and layout to create compelling multimedia content.
- **Technical Proficiency in Multimedia Production**: Graduates will have a strong understanding of multimedia production processes, including image editing, audio/video editing, animation techniques, interactive design, and user interface (UI) design.
- **Multimedia Project Management**: Students will gain experience in managing multimedia projects from concept development and planning through to execution, ensuring projects are completed on time, within budget, and to client specifications.
- **User-Centered Design**: Graduates will understand the importance of user-centered design principles and will apply usability testing, user research, and iterative design methodologies to create multimedia experiences that meet user needs and preferences.
- **Cross-Disciplinary Collaboration**: Students will collaborate effectively with professionals from other disciplines, such as developers, marketers, writers, and clients, to integrate multimedia designs into larger projects or campaigns.
- **Ethical and Cultural Awareness**: Graduates will demonstrate ethical and cultural sensitivity in their multimedia design practice, considering issues such as diversity, inclusivity, representation, intellectual property rights, and the societal impact of multimedia content.
- **Professional Development and Portfolio Building**: Students will develop a professional portfolio showcasing their best multimedia design work, demonstrating their skills, creativity, and versatility to potential employers or clients.
- **Entrepreneurial Skills**: Graduates will have the knowledge and skills to pursue entrepreneurial opportunities in multimedia design, such as freelance work, starting their own design studio, or developing innovative multimedia products or services.
- **Continued Learning and Adaptability**: Students will recognize the importance of lifelong learning and will be prepared to adapt to emerging technologies, design trends, and industry practices in the ever-evolving field of multimedia design.

COURSE OUTCOMES

B. Design Multimedia- Sem I

1. Drawing & Colour- I

- **Fundamental Drawing Skills:** Students should develop a solid foundation in drawing techniques, including line drawing, shading, perspective, and composition. They should be able to accurately represent objects, scenes, and figures on paper.
- **Understanding of Colour Theory:** Students should gain an understanding of basic colour theory principles, including the color wheel, primary, secondary, and tertiary colors, as well as concepts such as hue, saturation, and value.
- **Application of Colour:** Students should learn how to apply colour effectively in their drawings, including techniques such as blending, layering, and mixing colours to create desired effects.
- **Observational Skills:** Through practice and exercises, students should improve their ability to observe and accurately depict the visual world around them. This includes capturing details, proportions, and nuances of light and shadow.
- **Creative Expression:** Students should have opportunities to explore their creativity and develop their own artistic style through drawing and colouring exercises. They should learn to express themselves visually and experiment with different techniques and approaches.

2. Introduction to 3D- I

- **Understanding of 3D Concepts:** Students should develop a solid understanding of fundamental concepts in 3D graphics, including coordinate systems, geometry, and spatial relationships. They should grasp concepts such as vertices, edges, and polygons, and how these elements are used to create 3D models.
- **Proficiency in 3D Modeling Software:** Students should become proficient in using industry-standard 3D modeling software such as Autodesk Maya, Blender, or Cinema 4D. They should learn how to navigate the software interface, use modeling tools to create and manipulate 3D objects, and apply materials and textures to their models.
- **Basic Modeling Techniques:** Students should learn basic modeling techniques such as polygonal modeling, subdivision surface modeling, and sculpting. They should be able to create simple objects, characters, and environments using these techniques.
- **Introduction to Animation:** Students should be introduced to the principles of animation and learn how to animate 3D objects and characters. They should understand concepts such as key frames, timing, and easing, and how to create basic animations such as object movement, rotation, and deformation.
- **Texturing and Materials:** Students should learn how to apply textures and materials to their 3D models to create realistic surfaces. They should understand concepts such as UV mapping, material properties, and shader networks.

3. Workshop – I

- **Skill Development:** Participants should develop practical skills related to the topic of the workshop. This could include technical skills, such as learning how to use specific tools or software, or soft skills, such as communication, problem-solving, or teamwork skills.
- **Knowledge Acquisition:** Participants should gain a deeper understanding of the subject matter covered in the workshop. This could include theoretical knowledge, historical context, best practices, or industry standards related to the topic.
- **Hands-on Experience:** Workshops typically involve hands-on learning activities that allow participants to apply the knowledge and skills they are learning in real-world scenarios. This could include exercises, projects, case studies, simulations, or role-playing activities.
- **Collaboration and Networking:** Workshops often provide opportunities for participants to collaborate with others who share similar interests or goals. Participants may work together on group projects, discuss ideas and experiences, or network with peers and industry professionals.
- **Feedback and Reflection:** Participants should have opportunities to receive feedback on their work and reflect on their learning experiences. This could include peer feedback, instructor feedback, self-assessment, or group discussions.

4**. Elements of arts and multimedia**

- **Understanding of Basic Art Elements**: Students will demonstrate an understanding of the basic elements of art, including line, shape, form, texture, color, space, and value.
- **Application of Principles of Design**: Students will apply principles of design, such as balance, emphasis, rhythm, unity, and contrast, in multimedia projects.
- **Proficiency in Multimedia Tools and Software**: Students will gain proficiency in using various multimedia tools and software, including graphic design software (e.g., Adobe Photoshop, Illustrator), video editing software (e.g., Adobe Premiere Pro, Final Cut Pro), and audio editing software (e.g., Audacity, Adobe Audition).
- **Creation of Multimedia Projects**: Students will demonstrate the ability to create multimedia projects using a variety of media, including images, audio, video, and text.
- **Understanding of Multimedia Formats and Standards**: Students will understand different multimedia formats and standards, including image formats (e.g., JPEG, PNG), audio formats (e.g., MP3, WAV), and video formats (e.g., MP4, AVI), and how to optimize multimedia content for different platforms and purposes.
- **Critical Analysis of Multimedia Content**: Students will develop the ability to critically analyze multimedia content, including visual design, audio elements, and narrative structure, and understand how these elements contribute to the overall message and impact of the content.

- **Effective Communication through Multimedia**: Students will learn how to effectively communicate ideas and messages through multimedia content, including storytelling techniques, visual communication principles, and audience engagement strategies.
- **Collaboration and Teamwork Skills**: Students will collaborate with peers on multimedia projects, developing teamwork and communication skills necessary for working in multidisciplinary creative teams.
- **Ethical and Legal Considerations in Multimedia Production**: Students will understand ethical and legal considerations related to multimedia production, including copyright issues, fair use, attribution, and privacy concerns.
- **Portfolio Development**: Students will compile a portfolio of multimedia projects demonstrating their skills and creative abilities, which can be used for further study or employment in fields such as graphic design, advertising, filmmaking, animation, or web development.

5. Communication Skills in English – I

- To enhance the vocabulary and pronunciation of the students.
- How to write resume in an effective and proper way.
- To enhance their reading skills
- To teach business ethics.
- To learn note taking style

6. Punjabi

- ਪੁਸਤਕ 'ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ' ਵਿਚਲੇ ਕਵਿਤਾ ਅਤੇ ਕਹਾਣੀ ਭਾਗ ਦੇ ਵਿਭਿੰਨ ਆਧੁਨਿਕ ਕਵੀਆਂ ਤੇ ਕਹਾਣੀਕਾਰਾਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਦੇ ਪਾਠ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਵਧੇਰੇ ਸਾਹਿਤ ਪੜ੍ਹਨ ਅਤੇ ਲਿਖਣ ਦੀ ਚਿਣਗ ਪੈਦਾ ਹੁੰਦੀ ਹੈ। ਇਹਨਾਂ ਕਵਿਤਾਵਾਂ ਅਤੇ ਕਹਾਣੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਮਨੁੱਖੀ ਮਨ ਦੇ ਵਿਭਿੰਨ ਪੱਖਾਂ-ਪਾਸਾਰਾਂ ਨੂੰ ਸਮਝਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੁੰਦੀ ਹੈ।
- 'ਇਤਿਹਾਸਕ ਯਾਦਾਂ' ਪੁਸਤਕ ਵਿਚ ਭਾਰਤ ਦੀਆਂ ਮਹਾਨ ਰਾਜਨੀਤਿਕ, ਸਾਹਿਤਕ ਅਤੇ ਧਾਰਮਿਕ ਸ਼ਖ਼ਸੀਅਤਾਂ ਦੇ ਲਿਖੇ ਹੋਏ ਸੰਸਮਰਨ ਸ਼ਾਮਲ ਹਨ ਜੋ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਰਤ ਦੀ ਅਜ਼ਾਦੀ ਤੋਂ ਪਹਿਲਾਂ ਵਾਲ਼ੇ ਸਮੇਂ ਦੀਆਂ ਵੱਖ-ਵੱਖ ਇਤਿਹਾਸਕ ਘਟਨਾਵਾਂ ਅਤੇ ਲਹਿਰਾਂ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਂਦੀ ਹੈ। ਅਜਿਹਾ ਗਿਆਨ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਜਿੱਥੇ ਅਜ਼ਾਦੀ ਘੋਲਾਂ ਸੰਬੰਧੀ ਬਹੁਤ ਮਹੱਤਵਪੂਰਨ ਤੱਥਕ ਜਾਣਕਾਰੀ ਦਾ ਸਰੋਤ ਬਣਦਾ ਹੈ ਉੱਥੇ ਹੀ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਦੇਸ ਸੇਵਾ ਦੀ ਭਾਵਨਾ ਵੀ ਪੈਦਾ ਕਰਦਾ ਹੈ।
- ਪੈਰ੍ਹਾ ਰਚਨਾ ਅਤੇ ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉੱਤਰ ਦੇ ਅਭਿਆਸ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਪੜ੍ਹਨ ਤੇ ਲਿਖਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੋਣ ਦੇ ਨਾਲ਼ ਨਾਲ਼ ਸਿਰਜਣਾਤਮਿਕ ਰੁਚੀਆਂ ਵੀ ਵਿਕਸਿਤ ਹੁੰਦੀਆਂ ਹਨ।
- ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਟਕਸਾਲੀ ਭਾਸ਼ਾ, ਭਾਸ਼ਾ ਤੇ ਉਪ ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ ਅਤੇ ਪੰਜਾਬੀ ਦੀਆਂ ਵਿਭਿੰਨ ਉਪ ਭਾਸ਼ਾਵਾਂ ਦੀ ਪਛਾਣ ਕਰਨ ਦੀ ਸਮਝ ਵਿਕਸਿਤ ਹੁੰਦੀ ਹੈ। ਇਸਤੋਂ ਇਲਾਵਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਜਨਮ ਅਤੇ ਵੱਖ-ਵੱਖ ਵਿਕਾਸ ਪੜਾਵਾਂ ਦੀ ਜਾਣਕਾਰੀ ਮਿਲਦੀ ਹੈ।

6A. Basic Punjabi

- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਪੜ੍ਹਨ ਤੇ ਲਿਖਣ ਦੀ ਯੋਗਤਾ ਪੈਦਾ ਹੁੰਦਾ ਹੈ।
- ਪੰਜਾਬੀ ਸਾਹਿਤ ਬਾਰੇ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਹੁੰਦੀ ਹੈ।

- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਮਾਤ੍ਰਾਵਾਂ ਦੀ ਵਰਤੋਂ ਦਾ ਗਿਆਨ ਹੁੰਦਾ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਭਾਸ਼ਾਈ ਯੋਗਤਾ ਵਿਕਸਿਤ ਹੁੰਦੀ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਸ਼ਾ ਦੀ ਮੁੱਢਲੀ ਸ਼ਬਦਾਵਲੀ ਦਾ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੁੰਦਾ ਹੈ।

6B. Punjab History & Culture

- Understand the region's river, like the Indus, influenced settlement patterns, agricultural practices and trade routes, invasions, migrations and the formation of civilizations can provide insights into the historical development of the Punjab.
- Understand the various historical sources, including archaeological findings, inscriptions and ancient texts to reconstruct the past accurately.
- Understanding urban planning, efficient drainage system, multi-story buildings, artifacts, Agriculture, advanced irrigation system, crafts, including pottery and metal work.
- Understanding the migration patterns and settlements of the Indo-Aryans into the Indian Subcontinent.
- Understanding the dynamic changes in social & economic life during the Rigvedic and Later Rigvedic Periods.
- Both Buddhism & Jainism left a lasting impact on the cultural, moral & artistic landscape of Punjab. The teaching of compassion, non-violence & ethical conduct from these traditions contributed to the broader philosophical and religious diversity of the region.
- The remnants of Buddhism and Jain archaeological sites in Punjab bear witness to the historical presence and influence of these ancient Indian religions.

B. Design Multimedia -Sem II

1. Drawing & Colour II

- **Advanced Drawing Techniques:** Students should deepen their understanding and proficiency in drawing techniques, including anatomy, figure drawing, perspective, and rendering. They may explore more complex subjects and compositions, focusing on details, proportions, and expression.
- **Experimentation with Media:** Students may experiment with a wider range of drawing materials and media, such as charcoal, pastels, ink, or mixed media techniques. They should learn how to effectively use these materials to achieve desired effects and enhance their creative expression.
- **Advanced Colour Theory:** Building upon the basics of color theory learned in Drawing & Colour–I, students should delve into more advanced concepts such as color harmony, contrast, temperature, and color psychology. They should learn how to use color effectively to convey mood, atmosphere, and emotion in their artwork.
- **Composition and Design Principles:** Students should develop a deeper understanding of composition and design principles, including balance, rhythm, emphasis, and unity. They

should learn how to create dynamic and visually compelling compositions that engage the viewer and communicate their artistic intentions.

- **Personal Style Development:** Students should have opportunities to explore and develop their own artistic style, experimenting with different techniques, subject matter, and approaches to drawing and color. They should learn how to express their unique voice and vision through their artwork.

2. Introduction to 3D- II

- **Advanced 3D Modeling Techniques:** Students should further develop their 3D modeling skills by learning advanced techniques and tools. This could include advanced polygonal modeling, NURBS modeling, procedural modeling, and parametric modeling techniques.
- **Character Modeling and Animation:** Students may focus on character modeling and animation, learning how to create and rig complex character models and animate them using techniques such as skeletal animation, blend shapes, and inverse kinematics (IK).
- **Environment and Prop Design:** Students may explore 3D environment and prop design, learning how to create detailed and immersive environments for use in animation, gaming, or visual effects projects. This could involve techniques such as terrain modeling, set dressing, and prop design.
- **Advanced Texturing and Shading:** Students should deepen their understanding of texturing and shading techniques, learning how to create realistic textures and materials using advanced shaders, texture mapping techniques, and procedural textures.
- **Lighting and Rendering Techniques:** Students should learn advanced lighting and rendering techniques to enhance the visual quality of their 3D scenes. This could include techniques such as global illumination, image-based lighting, ray tracing, and advanced rendering settings optimization.

3. Theory of Media

- **Understanding of Media Theories**: Students will demonstrate an understanding of foundational theories in media studies, including but not limited to media effects theories, agenda-setting theory, cultivation theory, media ecology, cultural studies, and critical theory.
- **Critical Analysis of Media Content**: Graduates will be able to critically analyze various forms of media content, including print, broadcast, digital, and social media, examining issues such as representation, ideology, power dynamics, stereotypes, and media bias.
- **Historical Context of Media**: Students will gain knowledge of the historical development of media technologies, institutions, and practices, and understand how historical contexts have shaped the evolution of media and communication systems.
- **Media and Society**: Graduates will understand the complex relationship between media and society, including the role of media in shaping cultural norms, identities, political processes, social interactions, and collective memory.

- **Media Industries and Regulation**: Students will learn about the structure and dynamics of media industries, including production, distribution, and consumption processes, as well as regulatory frameworks and policy issues related to media ownership, censorship, privacy, and freedom of expression.
- **Global Perspectives on Media**: Graduates will develop a global perspective on media, considering the cultural, economic, and political dimensions of media systems in different regions of the world, as well as the influence of globalization and transnational media flows.
- **Media Literacy and Citizenship**: Students will enhance their media literacy skills, learning how to critically evaluate media messages, sources, and platforms, and become informed and responsible media consumers and citizens.
- **Ethical and Legal Considerations**: Graduates will understand ethical principles and professional standards in media production and consumption, as well as legal issues related to copyright, intellectual property rights, privacy, defamation, and media representation.
- **Media Research Methods**: Students will acquire basic research skills and methodologies used in media studies, including qualitative and quantitative approaches, content analysis, audience research, and media ethnography.
- **Application of Media Theory**: Graduates will be able to apply theoretical concepts and frameworks from media studies to analyze contemporary media phenomena, such as social media activism, online communities, digital culture, and media convergence.
- **Communication Skills**: Students will develop effective written and oral communication skills, including the ability to articulate complex ideas, construct persuasive arguments, and engage in informed discussions about media issues.

4. Workshop- II

- **Advanced Photography Techniques:** Participants should deepen their understanding of photography principles, including exposure, composition, lighting, and depth of field. They should learn advanced techniques such as long exposure photography, high dynamic range (HDR) imaging, and creative lighting setups.
- **Creative Vision and Style Development:** Participants should explore their own creative vision and develop their unique photographic style. They should learn how to use composition, lighting, color, and subject matter to create visually compelling and emotionally resonant images.
- **Advanced Camera Settings and Equipment:** Participants should learn how to master the advanced settings and features of their camera equipment, including manual mode, custom white balance, exposure compensation, and focus modes. They should also gain an understanding of different types of lenses and accessories and how to use them effectively.
- **Introduction to Adobe Lightroom:** Participants should become proficient in using Adobe Lightroom for post-processing and organizing their photographs. They should learn how

to import, organize, and manage their photo library, as well as how to use tools and features for basic and advanced photo editing.

- **Advanced Editing Techniques:** Participants should learn advanced editing techniques in Adobe Lightroom, such as selective adjustments using masks and brushes, advanced color grading and toning, noise reduction, sharpening, and lens corrections. They should also learn how to use presets and develop their own editing workflows.

5. Adobe Illustrator

- **Understanding of Illustrator Interface:** Participants should become familiar with the Adobe Illustrator interface, including tools, panels, and workspace organization. They should understand how to navigate the software efficiently and customize their workspace to suit their needs.
- **Basic Drawing and Shape Creation:** Participants should learn how to create basic shapes, lines, and paths using Illustrator's drawing tools. They should understand how to manipulate anchor points and handles to modify shapes and create custom designs.
- **Working with Text:** Participants should learn how to add, format, and manipulate text in Illustrator. They should understand how to create text on a path, wrap text around shapes, and apply text effects and styles to enhance their designs.
- **Color and Swatches:** Participants should learn how to work with color in Illustrator, including selecting, applying, and modifying colors using the color panel, swatches, and color picker tools. They should understand the difference between process and spot colors and how to create color gradients and patterns.
- **Illustration Techniques:** Participants should learn various illustration techniques using Illustrator's drawing tools and effects. This could include creating vector illustrations, icons, logos, and info graphics, as well as applying textures, gradients, and special effects to enhance their designs.

6. Communication Skills in English – II

- How to scan the text to find the main idea and to find specific information.
- To use their notes to organize their ideas.
- To make the students converse confidently and fluently.
- How to analyze and synthesize information presented in different sources.

7. Punjabi

- ਪੁਸਤਕ 'ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ' ਦਾ ਦੂਜਾ ਭਾਗ ਪੰਜਾਬੀ ਵਾਰਤਕ ਸਾਹਿਤ ਦੀਆਂ ਵਿਧਾਵਾਂ ਨਿਬੰਧ ਤੇ ਰੇਖਾ ਚਿੱਤਰ ਨਾਲ਼ ਸੰਬੰਧਿਤ ਹੈ ਜਿਸ ਵਿਚ ਪੰਜਾਬੀ ਦੇ ਪ੍ਰਮੁੱਖ ਵਾਰਤਕਕਾਰਾਂ ਦੀਆਂ ਰਚਨਾਵਾਂ ਸ਼ਾਮਲ ਹਨ। ਇਹਨਾਂ ਰਚਨਾਵਾਂ ਦਾ ਪਾਠ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ [illegible] ਸੰਬੰਧੀ ਅਗਾਂਹ ਵਧੂ ਜਾਣਕਾਰੀ ਪ੍ਰਦਾਨ ਕਰਨ ਦੇ ਨਾਲ਼-ਨਾਲ਼ ਉਹਨਾਂ ਦੀ ਬੌਧਿਕ ਸੂਝ ਨੂੰ ਵੀ ਪ੍ਰਫੁੱਲਿਤ ਕਰਦਾ ਹੈ।

- ‘ਇਤਿਹਾਸਕ ਯਾਦਾਂ’ ਪੁਸਤਕ ਦੇ ਦੂਜੇ ਭਾਗ ਵਿਚ ਅੰਗਰੇਜ਼ੀ ਰਾਜ ਸਮੇਂ ਹੋਈਆਂ ਕੁਝ ਮਹੱਤਵਪੂਰਨ ਘਟਨਾਵਾਂ ਜਿਵੇਂ ਸਾਕਾ ਨਨਕਾਣਾ ਸਾਹਿਬ ਆਦਿ ਦੀ ਵਿਸਤ੍ਰਿਤ ਜਾਣਕਾਰੀ ਦਰਜ ਹੈ। ਭਾਰਤ ਤੋਂ ਇਲਾਵਾ ਕੁਝ ਹੋਰ ਦੇਸਾਂ ਜਿਵੇਂ ਜਾਪਾਨ ਤੇ ਅਫ਼ਗਾਨਿਸਤਾਨ ਆਦਿ ਦੇ ਸਮਾਜ-ਸਭਿਆਚਾਰ ਬਾਰੇ ਵੀ ਜਾਣਕਾਰੀ ਮਿਲ਼ਦੀ ਹੈ। ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਅਜਿਹੀ ਜਾਣਕਾਰੀ ਦਾ ਪ੍ਰਸਾਰ ਉਹਨਾਂ ਨੂੰ ਆਪਣੇ ਦੇਸ ਪ੍ਰਤੀ ਵਧੇਰੇ ਜ਼ਿੰਮੇਵਾਰ ਨਾਗਰਿਕ ਬਣਾਉਂਦਾ ਹੈ
- ਸ਼ਬਦ ਬਣਤਰ ਅਤੇ ਸ਼ਬਦ ਰਚਨਾ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਭਾਸ਼ਾ ਸਮਰਥਾ ਵਿਚ ਵਾਧਾ ਹੋਣ ਦੇ ਨਾਲ਼-ਨਾਲ਼ ਪੰਜਾਬੀ ਸ਼ਬਦ ਰਚਨਾ ਦੇ ਮੁੱਢਲੇ ਸੰਕਲਪਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਲ ਹੁੰਦੀ ਹੈ ਅਤੇ ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਦੇ ਅਧਿਅਨ ਰਾਹੀਂ ਪੰਜਾਬੀ ਵਿਆਕਰਨ ਦੇ ਮੁਢਲੇ ਨਿਯਮਾਂ ਦੀ ਜਾਣਕਾਰੀ ਮਿਲ਼ਦੀ ਹੈ।
- ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਨੂੰ ਸਮਝਣ ਨਾਲ਼ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਦਫ਼ਤਰੀ ਕੰਮਕਾਜ ਕਰਾਉਣ ਲਈ ਲੋੜੀਂਦੇ ਪੱਤਰ ਵਿਹਾਰ ਵਿਚ ਸਹਾਇਤਾ ਮਿਲ਼ਦੀ ਹੈ। ਅਖਾਣ ਅਤੇ ਮੁਹਾਵਰਿਆਂ ਦੇ ਅਧਿਅਨ ਅਤੇ ਅਭਿਆਸ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਭਾਸ਼ਾ ਸਮਰਥਾ ਵਿਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ।

7A. Basic Punjabi

- ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਸ਼ਾ ਦੀ ਅੰਦਰੂਨੀ ਬਣਤਰ ਸੰਬੰਧੀ ਗਿਆਨ ਪ੍ਰਾਪਤ ਹੁੰਦਾ ਹੈ।
- ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੋਚਣ ਸ਼ਕਤੀ ਵਿਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ।
- ਵਿਦਿਆਰਥੀ ਕਿਸੇ ਵੀ ਵਿਸ਼ੇ ਦਾ ਗਹਿਨ ਅਧਿਅਨ ਕਰਨ ਦੇ ਕਾਬਲ ਹੁੰਦੇ ਹਨ।
- ਵਿਦਿਆਰਥੀ ਵਿਆਕਰਨਕ ਨੇਮ ਵਿਧਾਨਾਂ ਤੋਂ ਜਾਣੂ ਹੁੰਦੇ ਹਨ।
- ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸਾਹਿਤ ਪੜ੍ਹਨ ਦੀ ਰੁਚੀ ਵਧਦੀ ਹੈ ਅਤੇ ਉਹ ਸਮਾਜ ਨੂੰ ਚੰਗੀ ਸੋਚ ਦੇਣ ਦੇ ਸਮਰੱਥ ਹੁੰਦੇ ਹਨ।

7B. Punjab History & Culture

- Understanding the Alexander’s conquests led to the creation of the largest empires in history, the spread of Greek culture, art, architecture, philosophy & language.
- Understanding the influence of Mauryan rule, especially during the reign of Ashoka, contributed to the cultural, economic and administrative development of the region.
- Understanding the Kushans, through their interaction and rule, left a lasting imprints on Punjab’s cultural, religious and economic landscape.
- Understanding the impact of political stability, economic prosperity, cultural flourishing & a period of relative peace and progress under the Gupta Empire on Punjab.
- Understanding the Vardhana Empire who ruled over the northern regions, figures, social structures and Hindu religion practices.
- Understanding the development and consolidation of distinct socio-cultural identities within the diverse population of Punjab.
- Provide the comprehensive perspective on the development of language and education in Taxila, offering insight into the intellectual vibrancy and academic pursuits of this ancient educational centre.
- Understanding the frame work for comprehensive, studying the development of art , architecture, multidimensional nature of these creative endeavors and their impact on societies.

B. Design Multimedia -Sem -III

1. Film Appreciation–I

- **Understanding of Film Language**: Students will gain a foundational understanding of the language of cinema, including elements such as cinematography, editing, sound design, mise-en-scène, narrative structure, and genre conventions.
- **Historical Knowledge**: Graduates will have knowledge of significant developments in the history of cinema, including major movements, filmmakers, and landmark films, and understand how historical contexts have shaped the evolution of film as an art form.
- **Critical Analysis Skills**: Students will develop critical thinking skills and the ability to analyze and interpret films from various perspectives, including formal analysis, thematic analysis, cultural analysis, and ideological critique.
- **Cultural and Social Context**: Graduates will understand the cultural, social, and political contexts in which films are produced, distributed, and consumed, and be able to analyze how films reflect and influence broader cultural trends and societal issues.
- **Appreciation of Diversity in Cinema**: Students will appreciate the diversity of cinematic expressions from different countries, cultures, and cinematic traditions, including mainstream and independent cinema, documentary and fiction, and various genres and styles.
- **Awareness of Film Industry Practices**: Graduates will gain insight into the industrial practices of the film industry, including production, distribution, exhibition, marketing, and the roles of key industry stakeholders such as directors, producers, actors, and film critics.
- **Engagement with Film Theory**: Students will be introduced to key concepts and theories in film studies, such as formalism, realism, auteur theory, feminist film theory, postcolonial theory, and cultural studies, and be able to apply these theories in their analysis of films.
- **Development of Visual Literacy**: Graduates will develop visual literacy skills, including the ability to recognize and interpret visual symbols, motifs, and storytelling techniques used in film, and understand how these elements contribute to the overall meaning and impact of a film.
- **Effective Communication about Film**: Students will develop oral and written communication skills necessary for discussing, analyzing, and critiquing films in a clear, articulate, and persuasive manner, both in academic and informal settings.
- **Personal Enrichment and Cultural Enrichment**: Graduates will develop a lifelong appreciation for cinema as an art form and cultural artifact, and recognize the value of film as a medium for personal expression, cultural exchange, and social commentary.
- **Film Festival Experience**: Depending on the course structure, students may have the opportunity to attend film screenings and film festivals, engage in discussions with filmmakers and industry professionals, and gain first-hand experience of the film festival environment.

- **Creation of Film Reviews or Critiques**: In some cases, students may be required to produce film reviews, critiques, or analytical essays as part of their coursework, demonstrating their ability to apply critical thinking and communication skills to the analysis of specific films.

2. Animation in 3D

- **Understanding of Animation Principles:** Participants should develop a solid understanding of animation principles such as timing, spacing, squash and stretch, anticipation, follow-through, and exaggeration. They should learn how to apply these principles to create convincing and expressive character animations.
- **Proficiency in 3D Animation Software:** Participants should become proficient in using industry-standard 3D animation software such as Autodesk Maya, Blender, or Cinema 4D. They should learn how to navigate the software interface, animate objects and characters using keyframes, and use animation tools and controls effectively.
- **Character Animation Techniques:** Participants should learn techniques for animating characters in 3D, including rigging, weight painting, and character posing. They should understand how to create natural and expressive movements for characters, including walk cycles, facial expressions, and gestures.
- **Camera Animation:** Participants should learn how to animate cameras to create dynamic and engaging shots in their 3D animations. They should understand camera movements and angles, framing, and cinematography principles to enhance the storytelling and visual impact of their animations.
- **Storyboarding and Pre-visualization:** Participants should learn how to plan and storyboard their animations before beginning the animation process. They should understand how to create animatics and pre-visualization (previs) sequences to plan out the timing, pacing, and composition of their animations

3. Adobe Photoshop

- **Proficiency in Software Navigation**: Students will become proficient in navigating the Adobe Photoshop interface, including understanding the layout of tools, panels, menus, and keyboard shortcuts.
- **Understanding of Basic Image Editing Techniques**: Graduates will demonstrate an understanding of basic image editing techniques such as cropping, resizing, rotating, and straightening images, as well as adjusting brightness, contrast, and color balance.
- **Selection and Masking Skills**: Students will learn to use selection tools and masking techniques to isolate and manipulate specific areas of an image, such as using the lasso tool, quick selection tool, and layer masks.

- **Image Retouching and Restoration**: Graduates will acquire skills in retouching and restoring images, including removing blemishes, wrinkles, and imperfections, as well as repairing old or damaged photographs.
- **Layers and Layer Styles**: Students will understand the concept of layers in Photoshop and how to effectively use layers to organize and manipulate elements within a composition, as well as apply layer styles such as drop shadows, gradients, and blending modes.
- **Text and Typography**: Graduates will learn to add and format text layers in Photoshop, including adjusting font size, style, and color, as well as applying text effects and typography principles to enhance design compositions.
- **Photo Manipulation and Compositing**: Students will develop skills in photo manipulation and compositing, including blending multiple images together seamlessly, creating surreal or artistic effects, and incorporating elements from different sources into a cohesive composition.
- **Drawing and Painting Techniques**: Graduates will explore digital drawing and painting techniques using Photoshop's brush tools, including creating custom brushes, applying brush presets, and utilizing drawing tablets for more natural input.
- **Filters and Effects**: Students will learn to apply filters and special effects to enhance or transform images, including artistic filters, blur effects, distortion effects, and photo filters.
- **Output and Exporting**: Graduates will understand various output options in Photoshop, including saving files in different formats (e.g., JPEG, PNG, PSD), optimizing images for web or print, and preparing files for final output or presentation.
- **Creative Projects and Portfolio Development**: Students will complete creative projects and assignments that demonstrate their proficiency in using Photoshop for graphic design, digital art, photo editing, or other applications, and compile a portfolio showcasing their work.
- **Problem-Solving and Troubleshooting Skills**: Students will develop problem-solving and troubleshooting skills to address common challenges and errors encountered while working with Photoshop, such as file compatibility issues, performance optimization, and software crashes.

4. HTML 5

- **Understanding of HTML Syntax and Structure**: Students will develop a thorough understanding of HTML syntax and structure, including the use of elements, tags, attributes, and nesting to create well-formed HTML documents.
- **Proficiency in Creating Web Pages**: Graduates will demonstrate proficiency in creating static web pages using HTML, including structuring content, formatting text, creating lists, and inserting images and multimedia elements.
- **Semantic HTML Markup**: Students will learn the importance of semantic HTML markup and how to use semantic elements (e.g., <header>, <nav>, <main>, <section>, <article>,

<footer>) to enhance the accessibility, usability, and search engine optimization (SEO) of web pages.

- **Hyperlinking and Navigation**: Graduates will understand how to create hyperlinks and navigation menus using HTML anchor tags (<a>) and how to structure websites with multiple pages using relative and absolute URLs.
- **Forms and User Input**: Students will learn how to create HTML forms to collect user input, including text inputs, checkboxes, radio buttons, dropdown menus, and submit buttons, and understand how form data is submitted to a server.
- **Introduction to Cascading Style Sheets (CSS)**: Graduates will be introduced to CSS and understand how CSS is used to style and format HTML content, including basic concepts such as selectors, properties, values, and the box model.
- **Responsive Web Design Principles**: Students will learn the basics of responsive web design and understand how to create web pages that adapt to different screen sizes and devices using HTML and CSS techniques such as media queries and flexible layouts.
- **Introduction to Accessibility**: Graduates will be introduced to web accessibility principles and guidelines, including how to create accessible HTML markup and design web content that is usable by people with disabilities.
- **Validation and Debugging**: Students will learn how to validate HTML code using online validation tools and browser developer tools, and develop basic debugging skills to troubleshoot common HTML errors and issues.
- **Introduction to Version Control**: Graduates will be introduced to version control concepts and tools such as Git and GitHub, and understand how version control systems are used to manage and collaborate on web development projects.

5. Corel Draw

- **Understanding of Corel DRAW Interface:** Participants should become familiar with the Corel DRAW interface, including tools, palettes, menus, and workspace organization. They should understand how to navigate the software efficiently and customize their workspace to suit their needs.
- **Basic Drawing and Shape Creation:** Participants should learn how to create basic shapes, lines, and paths using Corel DRAW's drawing tools. They should understand how to manipulate objects, combine shapes, and use drawing aids to create custom designs and illustrations.
- **Working with Text:** Participants should learn how to add, format, and manipulate text in Corel DRAW. They should understand how to create artistic text, paragraph text, and text on a path, as well as how to apply text effects and styles to enhance their designs.
- **Color and Swatches:** Participants should learn how to work with color in Corel DRAW, including selecting, applying, and modifying colors using the color palette, swatches, and color picker tools. They should understand how to create color gradients, patterns, and blends to add visual interest to their designs.

- **Vector Graphics and Illustrations:** Participants should learn how to create vector graphics and illustrations using Corel DRAW's drawing and shaping tools. They should understand the advantages of vector graphics for scalability and resolution independence and learn how to create complex illustrations with multiple layers and objects.

6. Project- I

- **Project Planning and Management:** Participants should learn how to effectively plan and manage a project from start to finish. This could include defining project goals and objectives, creating timelines and milestones, identifying resources and stakeholders, and developing a project plan.
- **Problem Identification and Analysis:** Participants should learn how to identify and analyze problems or challenges related to the project. They should develop critical thinking and problem-solving skills to address issues that may arise during the project lifecycle.
- **Research and Information Gathering:** Participants should learn how to conduct research and gather relevant information to inform their project. This could involve gathering data, conducting surveys or interviews, reviewing literature or case studies, and analyzing findings to support project goals and decisions.
- **Creative and Innovative Thinking:** Participants should develop their creative and innovative thinking skills to generate ideas and solutions for their project. They should learn how to brainstorm, explore different perspectives, and think outside the box to come up with innovative approaches.
- **Collaboration and Teamwork:** Participants should learn how to collaborate effectively with team members or project stakeholders. They should develop communication, interpersonal, and teamwork skills to work together towards common project goals and objectives.

B. Design Multimedia -Sem -IV

1. Flash

- **Understanding of Flash Fundamentals**: Students will gain an understanding of the fundamental concepts and features of Adobe Flash, including the timeline-based animation, vector graphics, symbols, libraries, and Action Script programming language.
- **Proficiency in Flash Authoring**: Graduates will demonstrate proficiency in using the Adobe Flash authoring environment to create interactive multimedia content, including animations, games, presentations, and interactive websites.
- **Animation Techniques**: Students will learn animation techniques specific to Flash, such as keyframe animation, tweening (motion, shape, and color), masking, and filters, and understand how to create smooth and visually appealing animations.

- **Interactive Media Development**: Graduates will develop skills in creating interactive media using Flash, including user interface design, button interactions, navigation systems, and event-driven programming using Action Script.
- **Multimedia Integration**: Students will learn how to integrate various multimedia elements into Flash projects, including audio, video, images, and external data sources, and understand how to optimize multimedia assets for web delivery.
- **Cross-Platform Compatibility**: Graduates will understand the challenges and considerations involved in creating Flash content for different platforms and devices, including desktop browsers, mobile devices, and emerging technologies.
- **Accessibility and Usability**: Students will learn about best practices for designing accessible and usable Flash content, including considerations for keyboard navigation, screen reader compatibility, and alternative content for users with disabilities.
- **Performance Optimization**: Graduates will understand techniques for optimizing the performance of Flash content, including minimizing file size, optimizing graphics and animations, and reducing CPU and memory usage.
- **Security Considerations**: Students will learn about security vulnerabilities associated with Flash content and understand how to mitigate risks through secure coding practices, updating to the latest software versions, and using secure communication protocols.
- **Transition to Alternative Technologies**: While Adobe Flash is no longer widely used, students will gain awareness of alternative technologies for creating interactive multimedia content, such as HTML5, CSS, JavaScript, and Web GL, and understand how to adapt their skills to new tools and platforms.
- **Historical Context and Impact**: Graduates will gain an understanding of the historical significance of Adobe Flash in the evolution of web design and development, its impact on interactive media, and the reasons behind its eventual decline.
- **Portfolio Development**: Students will compile a portfolio showcasing their Flash projects and assignments, demonstrating their skills in animation, interactivity, and multimedia integration, which can be used for job applications or further education.

2. PHP

- **Understanding of PHP Fundamentals:** Participants should gain a solid understanding of fundamental PHP concepts, including syntax, variables, data types, operators, control structures (such as loops and conditional statements), functions, and arrays.
- **Web Development Basics:** Participants should learn how to integrate PHP with HTML and CSS to create dynamic web pages. They should understand how to embed PHP code within HTML documents and use PHP to generate dynamic content, handle form submissions, and interact with databases.
- **Database Integration:** Participants should learn how to connect PHP applications to databases, such as MySQL, PostgreSQL, or SQLite, using database connectivity libraries

or extensions (such as MySQLi or PDO). They should understand how to perform basic database operations, such as querying, inserting, updating, and deleting data.

- **Authentication and Security:** Participants should learn best practices for user authentication and security in PHP web applications. They should understand how to securely handle user authentication, manage user sessions, and protect against common security vulnerabilities, such as SQL injection, cross-site scripting (XSS), and cross-site request forgery (CSRF).
- **Form Handling and Validation:** Participants should learn how to handle form submissions in PHP, including processing user input, validating form data, and displaying error messages to users. They should understand how to use PHP functions and libraries for form validation and sanitization to prevent security vulnerabilities and ensure data integrity.

3. Dream Weaver

- **Understanding of Web Development Principles:** Participants should gain a solid understanding of fundamental web development concepts, including HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), and JavaScript. They should understand how these technologies work together to create dynamic and visually appealing websites.
- **Proficiency in Dreamweaver Interface:** Participants should become proficient in using the Adobe Dreamweaver interface, including tools, panels, and workspace organization. They should understand how to navigate the software efficiently and customize their workspace to suit their needs.
- **HTML and CSS Editing:** Participants should learn how to create and edit HTML and CSS code directly within Dreamweaver. They should understand how to use Dreamweaver's code editor, code hints, and syntax highlighting to write clean, efficient, and standards-compliant code.
- **Responsive Web Design:** Participants should learn how to create responsive web designs that adapt to different screen sizes and devices. They should understand how to use Dreamweaver's responsive design features, such as media queries and fluid grid layouts, to create websites that look and function well on desktops, tablets, and smartphones.
- **Visual Design and Layout:** Participants should learn how to design visually appealing layouts and designs using Dreamweaver's visual design tools and features. They should understand how to use the WYSIWYG (What You See Is What You Get) design view, layout grids, and design elements to create professional-looking websites.

4. Film Appreciation–II

- **Advanced Understanding of Film Language**: Students will develop an advanced understanding of film language, including formal elements such as cinematography,

editing, sound design, mise-en-scène, narrative structure, and genre conventions, as well as how these elements contribute to the overall meaning and impact of a film.

- **In-depth Analysis of Film Styles and Movements**: Graduates will be able to analyze and contextualize films within specific styles, movements, and traditions, including but not limited to classical Hollywood cinema, European art cinema, avant-garde cinema, documentary film, and world cinema, and understand the historical and cultural significance of these movements.
- **Critical Engagement with Film Theory and Criticism**: Students will engage critically with a range of film theories, approaches, and methodologies, including formalism, realism, auteur theory, feminist film theory, psychoanalytic theory, postcolonial theory, queer theory, and cultural studies, and apply these theories in their analysis of films.
- **Exploration of Film Genres and Subgenres**: Graduates will explore a variety of film genres and subgenres, such as drama, comedy, horror, science fiction, film noir, western, musical, and thriller, and understand the conventions, themes, and iconography associated with each genre.
- **Understanding of Film History and Historiography**: Students will deepen their knowledge of film history, studying key developments, movements, and trends in cinema across different historical periods and geographic regions, and critically evaluate the construction of film history through various historiographical approaches.
- **Cinematic Authorship and Collaboration**: Graduates will analyze the role of directors, screenwriters, cinematographers, editors, actors, and other collaborators in the creation of films, and understand how questions of authorship, style, and intentionality are negotiated within collaborative filmmaking processes.
- **Film and Society**: Students will examine the ways in which films reflect and influence broader social, cultural, political, and historical contexts, including issues related to representation, identity, power dynamics, social justice, and activism, and consider the ethical responsibilities of filmmakers in representing diverse experiences and perspectives.
- **Advanced Research and Writing Skills**: Graduates will develop advanced research and writing skills necessary for conducting independent research on film topics, synthesizing scholarly literature, constructing coherent arguments, and presenting findings in written essays, critiques, and presentations.
- **Exploration of Contemporary and Emerging Trends**: Students will explore contemporary trends and developments in cinema, including digital filmmaking, transmedia storytelling, interactive media, virtual reality (VR), augmented reality (AR), and streaming platforms, and consider the implications of these developments for the future of cinema.
- **Cultural and Global Perspectives**: Graduates will gain a deeper understanding of the cultural diversity of cinematic expression around the world, studying films from different countries, cultures, and cinematic traditions, and critically analyze issues of representation, globalization, and cultural exchange in international cinema.

5. Project II

- **Advanced Project Planning and Management:** Participants should further develop their skills in project planning and management. This could include defining project scope and objectives, developing detailed project plans, creating timelines and milestones, and allocating resources effectively.
- **Problem-solving and Decision-making Skills:** Participants should enhance their problem-solving and decision-making skills through hands-on project work. They should learn how to identify and analyze problems, evaluate alternative solutions, and make informed decisions to address project challenges.
- **Research and Analysis:** Participants should deepen their research and analytical skills to support project development and decision-making. They should learn how to gather and analyze data, conduct market research, assess project feasibility, and identify opportunities for innovation and improvement.
- **Creativity and Innovation:** Participants should cultivate their creativity and innovation skills to generate new ideas and solutions for their projects. They should learn how to think creatively, explore different perspectives, and apply innovative approaches to project design and development.
- **Collaboration and Teamwork:** Participants should continue to develop their collaboration and teamwork skills by working effectively with team members or project stakeholders. They should learn how to communicate, delegate tasks, resolve conflicts, and build trust and rapport within their project teams.

B. Design Multimedia - Sem -V

1. Adobe Premiere Pro

- **Proficiency in Software Navigation:** Students will become proficient in navigating the Adobe Premiere Pro interface, including understanding the layout of panels, tools, timelines, and keyboard shortcuts.
- **Understanding of Video Editing Fundamentals:** Graduates will demonstrate an understanding of fundamental video editing concepts and techniques, including importing media, organizing footage, trimming clips, and arranging sequences on the timeline.
- **Advanced Editing Techniques:** Students will learn advanced editing techniques such as ripple editing, rolling edits, slip and slide edits, keyframing, multicam editing, nested sequences, and advanced timeline management.
- **Color Correction and Grading:** Graduates will develop skills in color correction and grading, including adjusting exposure, contrast, color balance, and saturation, applying color presets and LUTs, and creating stylized looks and visual effects.
- **Audio Editing and Mixing:** Students will learn audio editing and mixing techniques, including adjusting levels, applying effects and filters, synchronizing audio with video, and creating audio transitions and mixes.

2. Adobe after Effects

- **Proficiency in Software Navigation:** Students will become proficient in navigating the Adobe After Effects interface, including understanding the layout of panels, tools, timelines, and keyboard shortcuts.
- **Understanding of Motion Graphics Principles:** Graduates will demonstrate an understanding of motion graphics principles, including keyframe animation, easing, timing, spacing, and interpolation, and apply these principles to create smooth and dynamic animations.
- **Visual Effects Creation:** Students will learn how to create visual effects such as particle effects, motion tracking, rotoscoping, green screen keying, and compositing using Adobe after Effects' built-in tools and third-party plugins.
- **Text Animation and Typography:** Graduates will understand how to create dynamic text animations and typography using After Effects' text tools, animation presets, text animators, and layer styles, and apply typographic principles to enhance visual communication.

3. Workshop III

- **Advanced Skill Development:** Participants should further develop their skills in the specific area or topic covered by the workshop. This could include mastering advanced techniques, tools, or methods related to the subject matter.
- **Specialization:** Participants may specialize in a particular aspect or niche within the broader field covered by the workshop. They should gain in-depth knowledge and expertise in their chosen specialization through hands-on practice and exploration.
- **Project Completion:** Participants may work on a specific project or series of projects throughout the workshop. By the end of the course, they should complete these projects, demonstrating their mastery of the workshop's content and concepts.
- **Portfolio Enhancement:** Participants should add to their portfolio of work, showcasing the projects and achievements completed during the workshop. This portfolio can be valuable for showcasing skills and expertise to potential clients, employers, or for personal growth and development.
- **Collaboration and Networking:** Participants should have opportunities to collaborate with others who share similar interests or goals. They may work together on group projects, exchange ideas and experiences, and network with peers and industry professionals.

4. Sound Editing & Recording

- **Understanding of Sound Principles:** Participants should gain a solid understanding of fundamental principles of sound, including acoustics, waveforms, frequency, amplitude, and digital audio concepts. They should understand how sound behaves and how it can be manipulated and recorded.

- **Proficiency in Audio Editing Software:** Participants should become proficient in using industry-standard audio editing software such as Adobe Audition, Pro Tools, GarageBand, or Audacity. They should understand the software interface, tools, and features for recording, editing, mixing, and mastering audio.
- **Recording Techniques:** Participants should learn various recording techniques for capturing high-quality audio in different environments and situations. This could include microphone selection and placement, room acoustics, recording levels, and signal processing techniques.
- **Editing and Mixing Skills:** Participants should learn how to edit and mix audio recordings effectively to achieve desired results. They should understand how to trim, cut, copy, paste, and arrange audio clips, as well as how to apply effects, adjust levels, and balance multiple tracks in a mix.
- **Post-production Techniques:** Participants should learn post-production techniques for enhancing and refining audio recordings. This could include noise reduction, equalization (EQ), compression, reverb, delay, modulation effects, and mastering techniques to polish the final mix.

5. Technical Theory of Media-II

- **Advanced Understanding of Media Technologies:** Students will develop an advanced understanding of the technical principles underlying various media technologies, including analog and digital audio and video systems, broadcasting standards, digital compression algorithms, and streaming protocols.
- **Media Production Workflow:** Graduates will understand the workflow of media production from capture to distribution, including pre-production planning, production techniques, post-production editing, and distribution strategies, and be able to apply this knowledge to create high-quality media content.
- **Digital Media Encoding and Compression:** Students will learn about digital media encoding and compression techniques, including lossy and lossless compression algorithms, codecs, bitrates, resolution, and aspect ratios, and understand how these factors impact the quality and file size of digital media files.
- **Media Storage and Archiving:** Graduates will understand principles and best practices for media storage, backup, and archiving, including file formats, storage media, RAID configurations, cloud storage solutions, and data management strategies to ensure data integrity and accessibility.
- **Broadcast Engineering and Transmission:** Students will explore the technical aspects of broadcast engineering and transmission, including television and radio broadcasting systems, transmission technologies, modulation techniques, broadcast signal propagation, and spectrum management.

6. Project- III

- **Advanced Project Planning and Management:** Participants should further develop their skills in project planning and management. This could include defining project scope and objectives, developing detailed project plans, creating timelines and milestones, and allocating resources effectively.
- **Problem-solving and Decision-making Skills:** Participants should enhance their problem-solving and decision-making skills through hands-on project work. They should learn how to identify and analyze complex problems, evaluate alternative solutions, and make informed decisions to address project challenges.
- **Research and Analysis:** Participants should deepen their research and analytical skills to support project development and decision-making. They should learn how to gather and analyze data, conduct market research, assess project feasibility, and identify opportunities for innovation and improvement.
- **Creativity and Innovation:** Participants should cultivate their creativity and innovation skills to generate new ideas and solutions for their projects. They should learn how to think critically, explore different perspectives, and apply innovative approaches to project design and development.
- **Collaboration and Teamwork:** Participants should continue to develop their collaboration and teamwork skills by working effectively with team members or project stakeholders. They should learn how to communicate, delegate tasks, resolve conflicts, and build trust and rapport within their project teams.

B. Design Multimedia - Sem -VI

1. 3D Studio Max

- **Understanding of 3D Modeling Principles:** Participants should gain a solid understanding of fundamental 3D modeling principles, including polygonal modeling, spline modeling, and subdivision surface modeling. They should understand how to create 3D models of objects, characters, environments, and architectural elements.
- **Proficiency in 3ds Max Interface:** Participants should become proficient in using the Autodesk 3ds Max interface, including tools, panels, and viewport navigation. They should understand how to navigate the software efficiently and customize their workspace to suit their needs.
- **Modeling Techniques:** Participants should learn various modeling techniques and workflows in 3ds Max. This could include box modeling, edge modeling, sculpting, and boolean operations for creating complex shapes and surfaces.
- **Texturing and UV Mapping:** Participants should learn how to apply textures and materials to 3D models in 3ds Max. They should understand how to create and edit materials, apply texture maps, and use UV mapping techniques to unwrap and texture 3D models accurately.

- **Animation Principles:** Participants should gain an understanding of fundamental animation principles such as keyframing, timing, spacing, and easing. They should learn how to create animations of objects, characters, and cameras using 3ds Max's animation tools and timeline.

2. Introduction to 3D

- **Understanding of 3D Concepts**: Students will develop a fundamental understanding of key concepts in 3D graphics, including modeling, texturing, lighting, rendering, and animation.
- **Proficiency in 3D Modeling**: Graduates will demonstrate proficiency in creating 3D models using polygonal modeling techniques, including the creation of basic shapes, complex objects, and organic forms.
- **Texturing and UV Mapping**: Students will learn how to apply textures to 3D models, including creating seamless textures, UV unwrapping, and applying materials to achieve realistic surface properties.
- **Introduction to Lighting and Rendering**: Graduates will understand basic principles of lighting and rendering in 3D, including different types of lights, light properties, and rendering techniques to create realistic or stylized visuals.
- **Animation Basics**: Students will be introduced to animation principles and techniques in 3D, including keyframing, interpolation, easing, and basic character animation.
- **Introduction to 3D Software**: Graduates will gain experience using industry-standard 3D software such as Autodesk Maya, Blender, Cinema 4D, or 3ds Max, and understand the interface, tools, and workflows commonly used in 3D production.
- **Understanding of 3D Pipelines**: Students will learn about the 3D production pipeline, including the stages of modeling, texturing, lighting, animation, and rendering, and how assets are created and managed throughout the pipeline.
- **Basic Rigging and Character Setup**: Graduates will be introduced to rigging concepts and techniques, including creating bone structures, skinning, and setting up basic character rigs for animation.
- **Introduction to Particle Systems and Dynamics**: Students will explore basic particle systems and dynamics simulations in 3D, including effects such as smoke, fire, water, and physics-based simulations.
- **Project-Based Learning**: Graduates will complete hands-on projects and assignments that apply the concepts and techniques learned in the course, allowing them to build a portfolio of 3D work demonstrating their skills and creativity.

3. Drawing & Illustration

- **Drawing Fundamentals:** Participants should gain a solid understanding of fundamental drawing principles, including line, shape, form, perspective, proportion, and composition.

They should learn how to observe and analyze subjects accurately and translate them onto paper or digital canvas.

- **Proficiency in Drawing Tools and Materials:** Participants should become proficient in using a variety of drawing tools and materials, both traditional (e.g., pencils, pens, charcoal, ink) and digital (e.g., graphic tablets, drawing software). They should understand how to select and use appropriate tools and materials for different drawing techniques and styles.
- **Sketching and Gesture Drawing:** Participants should develop their sketching and gesture drawing skills to capture the essence and movement of subjects quickly and fluidly. They should learn techniques for capturing gesture, gesture drawing, and creating dynamic and expressive sketches.
- **Understanding of Anatomy and Figure Drawing:** Participants interested in figurative drawing should learn anatomy and figure drawing principles. They should understand the skeletal structure, muscle anatomy, and proportions of the human figure, as well as techniques for capturing gesture, movement, and expression in figure drawing.
- **Rendering and Shading Techniques:** Participants should learn various rendering and shading techniques to add depth, volume, and texture to their drawings. This could include techniques such as hatching, cross-hatching, stippling, blending, and chiaroscuro (light and shadow).

4. Workshop- IV

- **Understanding of Stop Motion Principles:** Participants should gain a solid understanding of the fundamental principles of stop motion animation, including frame-by-frame animation, movement, timing, and storytelling. They should understand how to apply these principles to create engaging and expressive animations.
- **Proficiency in Stop Motion Tools and Equipment:** Participants should become proficient in using stop motion animation tools and equipment, including cameras, lighting equipment, tripods, and props. They should understand how to set up a stop motion animation studio and use equipment effectively to capture high-quality animations.
- **Storyboarding and Pre-production:** Participants should learn how to develop a storyboard and plan their stop motion animations effectively. They should understand how to visualize ideas, plan shots and sequences, create storyboards, and develop shot lists and production schedules.
- **Character and Set Design:** Participants should learn how to design characters and sets for stop motion animation. They should understand how to create characters with expressive movements and personalities, as well as how to design and build sets that enhance storytelling and visual appeal.
- **Animation Techniques:** Participants should learn various stop motion animation techniques, including puppet animation, claymation, cutout animation, object animation, and pixelation. They should understand how to animate characters and objects effectively using these techniques.

5. Blender

- **Understanding of 3D Modeling Principles:** Participants should gain a solid understanding of fundamental 3D modeling principles, including polygonal modeling, subdivision surface modeling, and sculpting. They should understand how to create 3D models of objects, characters, environments, and architectural elements.
- **Proficiency in Blender Interface:** Participants should become proficient in using the Blender interface, including tools, panels, and viewport navigation. They should understand how to navigate the software efficiently and customize their workspace to suit their needs.
- **Modeling Techniques:** Participants should learn various modeling techniques and workflows in Blender. This could include box modeling, edge modeling, sculpting, and boolean operations for creating complex shapes and surfaces.
- **Texturing and UV Mapping:** Participants should learn how to apply textures and materials to 3D models in Blender. They should understand how to create and edit materials, apply texture maps, and use UV mapping techniques to unwrap and texture 3D models accurately.
- **Animation Principles:** Participants should gain an understanding of fundamental animation principles such as keyframing, timing, spacing, and easing. They should learn how to create animations of objects, characters, and cameras using Blender's animation tools and timeline.

6. Project- IV

- **Advanced Project Planning and Management:** Participants should further refine their skills in project planning and management. This could involve defining project objectives, developing detailed project plans, creating timelines and milestones, and allocating resources effectively.
- **Complex Problem-solving and Decision-making:** Participants should enhance their ability to solve complex problems and make strategic decisions in the context of their project. They should demonstrate critical thinking, analytical reasoning, and creative problem-solving skills throughout the project lifecycle.
- **Research and Innovation:** Participants should engage in advanced research and innovation to address project challenges and opportunities. They should demonstrate the ability to gather and analyze data, conduct literature reviews, and develop innovative solutions or approaches to project goals.
- **Interdisciplinary Collaboration:** Participants should collaborate with experts from multiple disciplines or domains to leverage diverse perspectives and expertise in their project work. They should demonstrate effective communication, teamwork, and leadership skills in interdisciplinary project teams.
- **Prototype Development and Testing:** Participants should design, develop, and test prototypes or proof-of-concept solutions as part of their project work. They should

demonstrate proficiency in prototyping tools and methods, as well as the ability to iterate and refine prototypes based on user feedback and testing results.

B. Design Multimedia- Sem VII

1. Maya

- **Understanding of Maya Interface**: Students will become proficient in navigating the Autodesk Maya interface, including understanding the layout of panels, menus, and toolsets, and using keyboard shortcuts for efficient workflow.
- **Proficiency in 3D Modeling**: Graduates will demonstrate proficiency in creating 3D models using various modeling techniques in Maya, including polygonal modeling, NURBS modeling, and sculpting tools such as the Sculpt Geometry Tool and the Multi-Cut Tool.
- **UV Mapping and Texturing**: Students will learn how to unwrap UVs and apply textures to 3D models in Maya, including creating UV layouts, applying materials, shaders, and textures using the Hypershade editor, and using UV texture editors for precise texture placement.
- **Lighting and Rendering**: Graduates will understand principles of lighting and rendering in Maya, including different types of lights, light properties, shadow types, and rendering techniques using the Maya software renderer or third-party render engines like Arnold or V-Ray.
- **Animation Techniques**: Students will learn animation principles and techniques in Maya, including keyframing, animation curves, constraints, blend shapes, and rigging for character animation using the HumanIK or Biped rigs.
- **Rigging and Character Setup**: Graduates will learn rigging concepts and techniques in Maya, including creating bone structures, skinning, IK/FK systems, controllers, and setting up complex character rigs for animation.
- **Particle Systems and Dynamics**: Students will explore particle systems and dynamics simulations in Maya, including effects such as smoke, fire, water, cloth simulation, and rigid body dynamics using the nCloth and nParticle systems.
- **Maya Scripting and Automation**: Graduates will understand basic scripting concepts in Maya using MEL (Maya Embedded Language) or Python scripting, and how to automate repetitive tasks, create custom tools, and extend Maya's functionality through scripting.
- **Workflow Optimization**: Students will learn tips, tricks, and workflow techniques for optimizing their workflow in Maya

2. Mudbox

- **Understanding of Mudbox Interface**: Students will become proficient in navigating the Mudbox interface, including understanding the layout of panels, menus, and toolsets, and using keyboard shortcuts for efficient workflow.
- **Digital Sculpting Techniques**: Graduates will demonstrate proficiency in digital sculpting techniques using Mudbox, including sculpting organic and hard surface models using brushes, stamps, stencils, and layers.
- **Painting and Texturing**: Students will learn how to paint and texture 3D models in Mudbox, including creating and editing textures using brushes, layers, stencils, and projection painting techniques.
- **UV Mapping and Unwrapping**: Graduates will understand how to unwrap UVs in Mudbox and optimize UV layouts for texturing, including using automatic and manual unwrapping methods and adjusting UV shells for efficient texture placement.
- **3D Painting and Texture Projection**: Students will explore 3D painting techniques in Mudbox, including painting directly onto 3D models, projecting textures onto surfaces, and blending multiple textures seamlessly.
- **Sculpt Layers and Morph Targets**: Graduates will learn how to use sculpt layers and morph targets in Mudbox to non-destructively modify and refine sculpted details, allowing for iterative changes and adjustments.
- **Displacement and Normal Maps**: Students will understand how to generate displacement maps and normal maps in Mudbox, including exporting high-resolution sculpted details as maps for use in other 3D applications or game engines.
- **Integration with Other Software**: Graduates will understand how to integrate Mudbox with other software in the production pipeline, such as Autodesk Maya, 3ds Max, or Adobe Photoshop, for seamless asset transfer and collaboration.
- **Workflow Optimization**: Students will learn tips, tricks, and workflow techniques for optimizing their workflow in Mudbox, including using layers, groups, and masks effectively, organizing scenes, and managing assets.
- **Project-Based Learning**: Graduates will complete hands-on projects and assignments that apply the concepts and techniques learned in the course, allowing them to build a portfolio of sculpted and textured 3D models demonstrating their skills and creativity.
- **Industry Standards and Practices**: Students will be familiar with industry standards and best practices for digital sculpting and texturing, including file formats, naming conventions, version control, and collaboration workflows commonly used in professional studios.

3. Project – V

- **Advanced Project Planning and Management**: Participants should demonstrate proficiency in advanced project planning and management techniques. This could include

defining project scope, objectives, and deliverables; developing detailed project plans and schedules; identifying and managing risks; and allocating resources effectively.

- **Complex Problem-solving and Decision-making:** Participants should apply advanced problem-solving and decision-making skills to address complex challenges encountered during the project. They should analyze issues critically, evaluate alternative solutions, and make informed decisions to achieve project goals.
- **Innovative Solution Development:** Participants should engage in innovative solution development to tackle novel or unstructured problems. They should explore creative ideas, apply cutting-edge technologies or methodologies, and develop innovative solutions that address real-world needs or opportunities.
- **Interdisciplinary Collaboration and Leadership:** Participants should collaborate effectively with diverse stakeholders, experts, or team members from multiple disciplines. They should demonstrate strong leadership skills, foster collaboration, and leverage diverse perspectives to drive project success.
- **Prototype or Product Development:** Participants should design, develop, and test prototypes, products, or solutions as part of their project work. They should apply advanced prototyping techniques, iterate based on user feedback, and deliver high-quality prototypes or products that meet stakeholder requirements.

B. Design Multimedia- Sem -VIII

1. 3D and Animation in Photoshop

- **Understanding of 3D Concepts in Photoshop**: Students will develop a fundamental understanding of key 3D concepts and terminology within Photoshop's 3D workspace, including 3D modeling, texturing, lighting, and rendering.
- **Proficiency in 3D Modeling**: Graduates will demonstrate proficiency in creating basic 3D models using Photoshop's 3D tools, including extrusion, revolve, and lathe, as well as manipulating shapes and vertices to create custom models.
- **Texturing and Material Application**: Students will learn how to apply textures and materials to 3D models in Photoshop, including importing and creating textures, adjusting material properties, and applying realistic surface effects.
- **Lighting and Rendering**: Graduates will understand principles of lighting and rendering in Photoshop's 3D workspace, including different types of lights, shadow types, and rendering options, and how to adjust settings to achieve desired results.
- **Animation Basics**: Students will be introduced to basic animation techniques within Photoshop's 3D workspace, including keyframing, tweening, and creating simple animated sequences using 3D objects and cameras.

- **Camera Control and Animation**: Graduates will learn how to manipulate cameras within Photoshop's 3D workspace, including adjusting camera angles, perspectives, and depth of field, and animating camera movements for dynamic shots.
- **Integration with 2D Artwork**: Students will explore techniques for integrating 3D elements with 2D artwork in Photoshop, including blending 3D models seamlessly into photographic backgrounds, compositing 3D renders with 2D layers, and creating depth effects.
- **Exporting and Output**: Graduates will understand various output options for 3D content created in Photoshop, including exporting 3D models, textures, and animations for use in other software or for web and multimedia projects.
- **Project-Based Learning**: Students will complete hands-on projects and assignments that apply the concepts and techniques learned in the course, allowing them to create 3D models, textures, and animations within Photoshop's 3D workspace.
- **Workflow Optimization**: Graduates will learn tips, tricks, and workflow techniques for optimizing their workflow in Photoshop's 3D workspace, including organizing layers, using adjustment layers and filters, and leveraging keyboard shortcuts.
- **Portfolio Development**: Students will compile a professional portfolio showcasing their 3D models, textures, and animations created in Photoshop, demonstrating their skills, creativity, and ability to create compelling 3D artwork, which can be used for job applications or further education.
- **Creative Exploration**: Graduates will be encouraged to experiment and explore creative possibilities within Photoshop's 3D workspace, pushing the boundaries of traditional 2D design and expanding their understanding of digital art and design.

2. Motion Graphics for Commercials

- **Understanding of Motion Graphics Principles**: Students will develop a comprehensive understanding of motion graphics principles, including animation techniques, typography, color theory, composition, and visual storytelling.
- **Proficiency in Motion Graphics Software**: Graduates will demonstrate proficiency in using industry-standard motion graphics software such as Adobe After Effects, Adobe Premiere Pro, and Adobe Illustrator to create dynamic and engaging visual content for commercials.
- **Concept Development and Storyboarding**: Students will learn how to develop creative concepts for commercials, including brainstorming ideas, creating storyboards, and planning visual sequences to effectively communicate brand messages and engage target audiences.

- **Typography and Graphic Design**: Graduates will understand principles of typography and graphic design as they apply to motion graphics, including selecting fonts, creating visual hierarchy, using color and imagery, and designing compelling title sequences and graphics packages for commercials.
- **Animation Techniques**: Students will explore a variety of animation techniques in motion graphics, including keyframing, easing, timing, and interpolation, as well as incorporating motion presets, effects, and expressions to create dynamic and fluid animations.
- **Compositing and Visual Effects**: Graduates will learn how to composite multiple elements, such as video footage, graphics, and animations, using techniques such as masking, blending modes, and effects to create seamless and visually stunning compositions for commercials.
- **Sound Design and Audio Integration**: Students will understand the importance of sound design in commercials and learn how to integrate audio elements, including music, sound effects, and voiceovers, to enhance the impact and emotional resonance of motion graphics projects.
- **Brand Identity and Corporate Communication**: Graduates will learn how to effectively communicate brand identity and messaging through motion graphics, including incorporating brand colors, logos, and visual motifs to create cohesive and memorable commercial campaigns.
- **Client Collaboration and Feedback**: Students will develop skills in client collaboration and communication, including presenting concepts, soliciting feedback, and incorporating client revisions and preferences into motion graphics projects.
- **Project Management and Deadline Management**: Graduates will learn project management skills necessary for managing commercial projects, including setting timelines, allocating resources, and meeting client deadlines while maintaining high-quality standards.

3. 3D Human Modelling and Animations

- **Understanding of Human Anatomy:** Participants should gain a solid understanding of human anatomy, including skeletal structure, muscular system, and proportions. They should learn how to apply anatomical knowledge to create realistic human characters in 3D.
- **Proficiency in 3D Modeling Tools:** Participants should become proficient in using 3D modeling software such as Blender, Maya, or ZBrush to create 3D human characters. They should understand how to use modeling tools and techniques to sculpt, shape, and refine character meshes.
- **Character Design and Concept Art:** Participants should learn character design principles and techniques for creating concept art and reference materials for their 3D human

characters. They should develop concepts for character appearance, personality, and style before beginning the modeling process.

- **Character Rigging and Skinning:** Participants should learn how to rig 3D human characters with skeletal rigs and controls for animation. They should understand how to weight characters to the rig, set up inverse kinematics (IK) and forward kinematics (FK), and create controllers for character movements.
- **Facial Expression and Lip Sync:** Participants should learn how to create facial expressions and lip sync for their 3D human characters. They should understand how to rig facial features such as eyes, eyebrows, mouth, and jaw, and how to animate expressions and phonemes to create believable facial animations.

4. Industrial Training

- **Practical Skills Development:** Participants should gain practical skills and hands-on experience relevant to their chosen industry or field. This could include technical skills, operational skills, troubleshooting abilities, equipment operation, and safety procedures.
- **Industry Knowledge:** Participants should develop a solid understanding of the industry they are training in, including its history, current trends, key players, regulations, and best practices. They should become familiar with industry terminology, standards, and protocols.
- **Professional Development:** Participants should enhance their professional skills and competencies, including communication skills, teamwork, leadership, time management, problem-solving, and adaptability. They should learn how to work effectively in a professional environment and contribute positively to team goals.
- **Project Experience:** Participants may have the opportunity to work on real-world projects or simulations relevant to their industry. They should gain experience in project planning, execution, and evaluation, as well as teamwork and collaboration in project settings.
- **Networking Opportunities:** Participants should have opportunities to network with professionals, experts, and peers in their industry. They may attend industry events, seminars, workshops, or conferences and connect with potential mentors, employers, or collaborators.

M.SC IN COMPUTER SCIENCE

PROGRAMME OUTCOMES

The program outcomes of a Master of Science in Computer Science (MSc Computer Science) typically include:

- **Advanced Knowledge:** Graduates will demonstrate a deep understanding of theoretical and practical concepts in computer science, including algorithms, data structures, and computer architecture, operating systems, and software engineering principles.
- **Specialization Proficiency:** Depending on their chosen specialization, students will exhibit advanced skills and expertise in areas such as artificial intelligence, machine learning, data science, cyber security, computer networks, software engineering, or other specialized fields within computer science.
- **Research Skills:** Ability to conduct independent research, analyze complex problems, and develop innovative solutions using scientific methodologies, experimental techniques, and computational tools.
- **Advanced Programming Skills:** Proficiency in programming languages, software development methodologies, and tools required for designing, implementing, testing, and debugging complex software systems and applications.
- **Critical Thinking and Problem Solving:** Capacity to critically evaluate problems, formulate hypotheses, and apply logical reasoning and analytical techniques to develop effective solutions in diverse computational contexts.
- **Communication and Presentation:** Effective communication skills, both oral and written, necessary for articulating technical concepts, presenting research findings, and collaborating with peers, faculty, and industry professionals.
- **Project Management:** Ability to plan, execute, and manage large-scale software projects, including requirements analysis, project planning, resource allocation, risk management, and project documentation.
- **Ethical and Professional Responsibility:** Awareness of ethical issues in computer science research and practice, adherence to professional standards and codes of conduct, and commitment to responsible and ethical use of technology.

COURSE OUTCOMES

M.Sc (CSC)- Sem I

1. Advanced Data Structures (MCS-101)

- A comprehensive deep understanding of adv. sem. data structures and their applications.

- Proficiency in analyzing and designing efficient algorithms for various computational problems.
- Skills to address challenges associated with large datasets and external storage.
- Placement opportunities in software development, database management, and algorithm optimization.
- Roles in industries dealing with large-scale data, such as finance, healthcare, and e-commerce.

2. Advanced Computer Architecture (MCS-102)

- Students will comprehend synchronous (Vector/Array, SIMD, Systolic) and asynchronous (MIMD, reduction) computing paradigms.
- Graduates will be familiar with trends in parallel processing, basic uniprocessor architecture, and the mechanisms behind parallel processing in uniprocessor systems.
- Students will gain insights into various parallel computer structures, including pipeline computers, array computers, and multiprocessor systems.
- Graduates will comprehend the principles of linear pipelining, overlapped parallelism, and the classification of pipeline processors.

3. Network Design & Performance Analysis (MCS-103)

- Students will comprehend the principles and concepts underlying network design, including protocols, topologies, and layers.
- Students will be able to plan, design, and implement networks based on specific requirements, considering factors such as scalability, reliability, and security.
- Students will learn to analyze network performance using various tools and metrics, and to identify and address performance bottlenecks.
- Students will understand the principles of network security and be able to implement security measures to protect against threats and attacks.
- Students will be familiar with QoS concepts and techniques to ensure that networks meet performance requirements for bandwidth, latency, and reliability.
- Students will learn to estimate network capacity requirements and to plan for future growth and scalability.
- Students will develop the ability to troubleshoot network issues and to apply critical thinking and problem-solving skills to resolve them.
- Students will enhance their ability to communicate effectively and collaborate with others in designing and managing network infrastructures.

4. Discrete Structures (MCS-104)

- Understand the basic concepts of sets, including elements, subsets and set operations

- Classify relations as reflexive, transitive and equivalence relations, Define function and distinguish between one to one ,onto and bijective functions
- Solve problems involving distribution and allocation using pigeon gole principle
- Define graps , vertices, edges and explore different types of graphs(directed, undirected, weighted)
- Analyze conditions under which a graph ha Hamiltonian paths or cycles
- Understand the concept of a rooted tree and its components, Differentiate between directed and undirected trees
- Apply counting techniques to solve problems involving combinations and arrangements
- Solve problems involving permutations and combinations in various context including probability and combinatorial analysis
- Apply recurrence relations to model and solve real world problems, Apply generating functions to solve problems problems involving sequences and series
- Define and understand the properties of a ring ,including closure under addition and multiplication
- Define Boolean algebra and understand its basic operation on conjunction, disjunction and compliment.
- Understand how Boolean algebra is applied in the design and analysis of algorithm.

5. Soft Computing (MCS-105)

- Students will gain an understanding of various soft computing techniques, including fuzzy logic, neural networks, genetic algorithms, and machine learning.
- Students will learn how to apply soft computing techniques to solve complex problems in various domains, such as pattern recognition, data mining, optimization, and control systems.
- Students will understand the principles of fuzzy logic and how it can be used to handle uncertainty and imprecision in decision-making processes.
- Students will learn about artificial neural networks and their applications in modeling complex relationships and solving pattern recognition problems.
- Students will be introduced to genetic algorithms and their use in optimization and search problems inspired by the process of natural selection.
- Students will gain knowledge of basic machine learning concepts and algorithms, including supervised and unsupervised learning, and reinforcement learning.
- Students will explore the integration of different soft computing techniques to develop hybrid systems that can solve more complex problems.
- Students will develop practical skills in implementing and applying soft computing techniques using software tools and programming languages.
- Students will enhance their critical thinking and problem-solving skills by applying soft computing techniques to real-world problems.

- Students will consider the ethical and social implications of using soft computing techniques in various applications, such as privacy, bias, and fairness.

M.Sc (CSc)- Sem II

1. Theory of Computation (MCS-201)

- Students will develop a deep understanding of language classes, grammars, and their properties.
- They will be able to apply operations on languages and analyze closure properties of different language classes.
- Understanding automata and their equivalence with grammars will enhance students' ability to design language processors.
- Familiarity with syntax analysis and formal properties of grammars will prepare students for language parsing and compiler design tasks.

2. Image Processing (MCS-202)

- Understand the fundamental concepts and principles of digital image processing.
- Develop skills in enhancing image quality and visual perception.
- Learn techniques to restore images affected by noise and degradation.
- Master the application of filters and convolution operations for image processing.
- Gain proficiency in dividing an image into meaningful regions.
- Understand the principles of image compression for efficient storage and transmission.

3. Design & Analysis of Algorithms (MCS-203)

- Able to understand the concept of developing algorithms and finding its complexity analysis.
- Able to develop algorithms for real-time problems using different approaches like Divide and conquer, Greedy, Dynamic programming, and Backtracking.
- Able to implement different approaches to solve certain searching and sorting problems.

4. Cloud Computing (MCS – 204)

- Students will gain a solid understanding of the fundamental concepts, principles, and components of cloud computing, including virtualization, distributed computing, and service models.
- Students will learn about different cloud service models, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), and their respective characteristics and use cases.
- Students will understand various cloud deployment models, such as public cloud, private cloud, hybrid cloud, and community cloud, and their implications for security, scalability, and performance.

- Students will learn about cloud security best practices, including data encryption, identity and access management (IAM), network security, and compliance, to ensure the security and privacy of cloud-based applications and data.
- Students will gain knowledge of cloud networking concepts and technologies, including virtual private clouds (VPCs), software-defined networking (SDN), and cloud-native networking services, to design and manage cloud networks effectively.
- Students will understand different types of cloud storage services, such as object storage, block storage, and file storage, and learn how to manage and access data stored in the cloud efficiently.
- Students will become familiar with popular cloud computing platforms, such as Amazon Web Services (AWS), Microsoft Azure, and Google Cloud Platform (GCP), and gain hands-on experience in deploying and managing cloud-based applications on these platforms.
- Students will learn about cloud migration strategies and best practices for transitioning on-premises applications and workloads to the cloud, as well as strategies for cloud adoption and integration with existing IT infrastructure.

5. Distributed Database Systems (MCS-205)

- A comprehensive understanding of distributed database concepts, architecture, and management.
- It provides proficiency in handling complex queries, optimizing database operations, and managing transactions in a distributed environment.
- It will provide job opportunities in companies with distributed and large-scale data systems.
- Roles in database administration, optimization, and design. Research and development opportunities in the field of distributed databases and systems.

M.Sc (CSc)- Sem III

1. Advanced Software Engineering (MCS-301)

- To understand the basics of software project management and the associated concepts.
- Able to perform re-engineering, restructuring and reverse engineering of existing systems.
- Able to analyze and design object-oriented systems by collaborating typical design considerations.

2. System Software (MCS-302)

- Students will gain a comprehensive understanding of system software, including its evolution and components.
- They will be familiar with translators, loaders, interpreters, compilers, and assemblers, and their roles in software development.

- Understanding macro processors and compilers will enable students to enhance their programming and software development skills.
- Knowledge of loaders, linkage editors, and other system software will provide a holistic view of the system-level components in the computing environment.

3. Data Mining and Warehousing (MCS-303)

- Students will gain a comprehensive understanding of data warehousing concepts, architectures, and implementation strategies.
- They will be able to differentiate between operational database systems and data warehousing, recognizing the need for a separate data warehouse.
- Understanding OLAP servers, data mining techniques, and trends will prepare students for designing and implementing effective data solutions in various domains.

4. Concept of Core and Advanced Java (MCS-304)

- Comprehensive Java Proficiency
- Problem-Solving and Implementation Skills
- Object-Oriented Design Mastery
- Web Application Development Competence
- Upon completion of the course, students will be equipped to apply Java programming skills to various real-world scenarios, laying a strong foundation for further studies and professional development in Java-based technologies

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5. Network Programming (MCS-305)

- Sockets are endpoints for communication between two machines over a network. They allow programs to send and receive data.
- Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) are two common transport protocols used in network programming. TCP provides reliable, ordered, and error-checked delivery of data, while UDP provides faster transmission with no guarantee of delivery or order.
- In network programming, applications often follow a client-server model, where one program (the client) requests services or resources from another program (the server).
- Various APIs and libraries, such as the Python socket module or the Java java.net package, provide abstractions and tools for network programming.

M.Sc (CSc)- Sem IV

1. Advanced Web Technologies (MCS-401)

- Understand and effectively use standard controls to display information, accept user input, submit form data, display images, utilize the control, and work with the hyperlink control.

- Gain proficiency in implementing validation techniques to ensure data integrity and user input accuracy.
- Develop skills in utilizing rich controls for tasks such as file uploads, calendar displays, advertisements, page views, and wizards.
- Master the creation and modification of master pages, and understand how to dynamically load master pages.
- Understand the integration of ASP.NET with databases, including creating database connections, executing commands, using parameters, and caching data.
- Learn caching techniques for improving performance, including page output caching, partial page caching, data source caching, data caching, and SQL cache dependencies.

2. Microprocessor and Its Applications (MCS-402)

- Understanding the architecture and operation of microprocessors.
- Learning the instruction set architecture (ISA) and programming concepts for microprocessors.
- Developing skills in programming microprocessors using assembly language and higher-level languages.
- Designing and implementing simple microprocessor-based systems.
- Understanding the interfacing of microprocessors with memory, I/O devices, and other peripherals.
- Analyzing and troubleshooting microprocessor-based systems.

3. Object Oriented Modeling, Analysis and Design (MCS-403)

- Students will master foundational concepts of object-oriented programming, including objects, classes, relationships, and advanced features like multiple inheritance and package management.
- Students will develop advanced modeling skills, encompassing meta modeling, metadata utilization, functional modeling with ONN, and the ability to combine ONN constructs for comprehensive problem-solving.
- Students will demonstrate holistic analysis skills, creating comprehensive object models, effectively using data dictionaries, dynamic modeling, and developing functional models for system understanding.
- Students will showcase strategic system design abilities, devising well-organized architectures, implementing appropriate database management paradigms, elaborating on object models, and evaluating the quality of design models for optimal system performance.

DIPLOMA IN COMPUTER APPLICATION

PROGRAMME OUTCOMES

The outcomes of a Diploma in Computer Applications (DCA) course typically include a range of knowledge and skills related to computer applications and information technology. Here are some common program outcomes:

- **Proficiency in Computer Fundamentals:** Students should gain a strong understanding of basic computer concepts, including hardware, software, operating systems, and peripherals.
- **Application Software Skills:** Proficiency in using popular software applications such as word processors, spreadsheets, presentation software, and databases. Students should be able to create, edit, and format documents, spreadsheets, presentations, and databases effectively.
- **Programming Skills:** Basic programming knowledge in languages such as SQL and PL/SQL. This includes understanding programming concepts like variables, control structures, loops, functions, and basic algorithms.
- **Web Development Skills:** Introduction to web technologies such as HTML, CSS, and JavaScript. Ability to create simple web pages and understand the structure of the web.
- **Database Management:** Understanding of database management systems (DBMS) and ability to design, create, and query databases using SQL.

COURSE OUTCOMES

DCA – SEM I

1. Information Technology and Operating System (CTL1011)

- Upon completion of the "Information Concepts and Processing" course, students will develop a comprehensive understanding of the evolution of information processing, data information language, and communication networks.
- They will gain proficiency in client-server systems, computer networks, LAN, and WAN technologies.
- The course covers fundamental aspects of the internet, including understanding its structure, basics of e-mail, web browsing techniques, and effective information retrieval on the web.
- Students will delve into the elements of computer processing systems, including hardware components such as the CPU, storage devices, VDU, and input-output data communication equipment.

- The software aspect will cover system software, application software, and various programming languages, spanning machine code, assembly language, higher-level languages, and fourth-generation languages.
- In the operating system section, students will understand the concept, evolution, and various types of operating systems, including single-user and multi-user systems like Unix, XENIX, and VAX/VMS.

2. PC Computing–I (CTL1012)

- Students will demonstrate a comprehensive understanding of Windows 1.1, including the origin, components of the screen, types of windows, and anatomy of a window.
- Graduates will be proficient in Microsoft Word, showcasing skills in creating and editing documents, managing page layouts, and utilizing features like headers, footers, and spell checker.
- PowerPoint Mastery: Students will acquire expertise in Microsoft PowerPoint, enabling them to create engaging presentations, use templates, wizards, and various views effectively, and incorporate multimedia elements.
- Graduates will be adept at saving, naming, and organizing Word documents in different formats and locations, ensuring efficient document management.
- Students will demonstrate the ability to create and format tables in Word, including adding, editing, and formatting text within tables, adjusting row heights and column widths, and applying borders and shading.
- Graduates will be skilled in working with graphics, drawing objects, using frames, and positioning objects within Word documents.
- Students will understand and effectively utilize mail merge features in Word, streamlining the process of creating personalized documents.
- Graduates will be proficient in printing and saving PowerPoint presentations, applying various views, and incorporating multimedia elements.
- Students will master text formatting and enhancement in Word and PowerPoint, including changing fonts, sizes, styles, and applying various effects to improve visual appeal.
- Graduates will be equipped to use Word and PowerPoint seamlessly with other applications, showcasing versatility and adaptability in a professional setting.

<u>DCA- Sem II</u>

1. Database Management Systems (CTL1061)

- Students will acquire a thorough understanding of Database Management System concepts, including components, E.R. diagrams, data models, and various database models such as Hierarchical, Network, and Relational.
- Graduates will demonstrate knowledge of database security, protection, integrity, and recovery, emphasizing the importance of maintaining data consistency.

- Students will grasp the concept of concurrency in databases, understanding mechanisms to manage simultaneous transactions for optimal performance.
- Graduates will have an insight into the complexities of distributed databases, enabling them to comprehend and navigate the challenges associated with decentralized data systems.
- Students will gain practical skills in Oracle 10g SQL, including Data Manipulation Language (DML), Data Definition Language (DDL), and Data Control Language (DCL) operations.
- Graduates will be adept at advanced SQL techniques such as join methods, sub queries, union, intersection, and minus operations, enhancing their ability to retrieve and manipulate data efficiently.

2. PC Computing–II (CTL1062)

- Students will master the creation of worksheets, performing computations, and utilizing advanced features like data sorting, filling, querying, and filtering, showcasing a strong foundation in spreadsheet functionalities.
- Graduates will demonstrate proficiency in printing worksheets, creating visually appealing graphs, and performing what-if analyses, enhancing their ability to present and analyze data effectively.
- Students will acquire a solid understanding of MS Access, including database creation, table design, and query formulation, showcasing competence in fundamental database management concepts.
- Graduates will demonstrate the ability to create comprehensive reports and forms in MS Access, incorporating graphs for enhanced data representation, providing a well-rounded skill set in database application development.
- Overall, students will apply their knowledge practically, ensuring the effective use of MS Excel for data analysis and presentation, and MS Access for database management and reporting.

POST GRADUATE DIPLOMA IN COMPUTER APPLICATION

PROGRAMME OUTCOMES

Typically aims to equip students with a strong foundation in computer applications, software development, and related areas. The specific program outcomes may vary depending on the institution offering the course and its curriculum. However, here are some common program outcomes often associated with PGDCA:

- **Proficiency in Programming Languages:** Students should gain proficiency in programming languages such as C,Dbms. They should be able to write, debug, and maintain programs in these languages.
- **Software Development Skills:** Students should develop skills in software development methodologies, including analysis, design, coding, testing, and debugging of software applications.
- **Database Management:** Understanding of database management systems (DBMS) and proficiency in using database management software like SQL. Students should be able to design, create, and query databases.
- **Web Development:** Knowledge of web development technologies such as HTML, CSS, JavaScript, and server-side scripting languages like PHP or ASP.NET. Ability to develop dynamic and interactive web applications.
- **Networking Concepts:** Understanding of basic networking concepts including TCP/IP protocols, LAN/WAN setup, network security, and troubleshooting network issues.
- **Operating Systems:** Familiarity with different operating systems such as Windows, Linux, and UNIX. Ability to install, configure, and administer operating systems and troubleshoot common issues.
- **Problem-Solving Skills:** Development of analytical and problem-solving skills necessary for software development and troubleshooting technical issues.
- **Communication Skills:** Improvement in written and oral communication skills, essential for effective collaboration with team members, clients, and stakeholders.
- **Project Management:** Understanding of project management principles and methodologies. Ability to manage software development projects effectively, including planning, scheduling, and resource allocation.
- **Ethical and Professional Responsibilities:** Awareness of ethical issues related to computer technology, including privacy, security, and intellectual property rights. Understanding of professional responsibilities and adherence to ethical standards in the field of computing.
- **Continuous Learning:** Cultivation of a mindset for continuous learning and adaptation to new technologies and methodologies in the rapidly evolving field of computer applications.

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COURSE OUTCOMES

PGDCA- Sem I

1. PC COMPUTING-I (MS Office) 2003

- Students will gain proficiency in using MS Office applications - Word, PowerPoint, Excel, and Access.
- They will be able to create, edit, format, and print documents in MS Word.
- Understanding of MS PowerPoint will enable students to create visually appealing presentations.
- Knowledge of MS Excel and Access will empower students to manipulate data, perform analyses, and create databases.

2. PC COMPUTING–II (Professional DTP)

- Students will gain proficiency in image editing and manipulation using Photoshop 5.5, understanding the basics of graphics and image resolution.
- They will acquire skills in using essential Photoshop tools, managing layers, and applying filters for various effects.
- Knowledge of Corel Draw-9 will empower students with vector graphic design skills, precision tools, and advanced design techniques.
- Overall, the course will equip students with practical skills in graphic design, image editing, and vector graphics creation using industry-standard software.

3. Fundamentals of Computer & Operating Systems

- Upon completing the course students will develop a strong foundation in computer fundamentals, Windows Vista, Disk Operating System (DOS), and UNIX.
- They will gain a comprehensive understanding of the components of computers, input-output devices, secondary storage devices, types of software, and the basics of data communication and networks. In the Windows Vista section, students will become proficient in navigating the desktop, using window features, managing files and folders, and customizing the appearance.
- The DOS segment will cover the functions of operating systems, batch systems, real systems, and essential DOS commands for system booting and file management. In the UNIX sections, students will grasp the features, structure, and file system of UNIX.
- The course outcome includes the ability to solve practical problems using the learned concepts, efficient use of DOS and UNIX commands, and proficiency in navigating and customizing the Windows Vista environment. Students will be equipped with practical skills in file management, command line operations, and basic shell programming.

- The course prepares them for diverse roles requiring a strong understanding of computer fundamentals and operating systems.

4. Database Management System through Oracle-10g & System Analysis & Design

- Students will gain a comprehensive understanding of database management, including database systems, data independence, and relational databases.
- Proficiency in Oracle 10g SQL commands and features will empower students to manage and manipulate data effectively.
- Knowledge of PL/SQL will enable students to develop procedural and modular code for Oracle databases.
- Understanding system analysis, design, and development tools will prepare students for efficient and effective system development processes.

PGDCA- Sem II

1. Network Concepts and Management

(Hardware, Software, Setting In Linux/Unix/Nt Environment)

- Students will have a solid understanding of network hardware and software requirements, including topologies, reference models, and design considerations.
- Proficiency in network security concepts, data compression, cryptography, and IP addressing schemes.
- Knowledge of NT administration, including account policies, user account creation, group membership, and share administration.
- Understanding of UNIX and Linux operating systems, including their architecture and features.
- The ability to perform a comparative study of Windows NT Server, Unix, and Linux, enabling students to make informed decisions in network design and administration.

2. Programming in C

- Students will gain a strong foundation in C programming, including the fundamentals of data types, operators, and expressions.
- Proficiency in control structures, functions, and arrays, including the handling of strings.
- Understanding of pointers and their applications in C programming.
- Knowledge of structures and unions, providing the ability to organize and manipulate complex data.
- Competence in managing data files and performing file operations in C.

3. Introduction to Scripting Languages

Web Designing and Uses Of Internet

- Upon completing the course students with a strong foundation in creating web content using HTML.
- In Section B, they gain proficiency in Front Page 2000 for website creation, covering features like toolbars, image manipulation, hyperlinks, tables, and forms.
- Section C explores internet applications, including connectivity, the World Wide Web, email, FTP, IRC, Virtual Reality, Web Publishing, and Web Hosting.
- Section D delves into Cyber Crime, covering types of cybercrimes, cookies, viruses, Trojan horses, worms, and cyber security measures. Overall, the course prepares students for web development, digital content creation, and internet security roles.

4. Programming in Visual Basic with Active–X

- Students will gain proficiency in developing applications using the Visual Basic environment.
- Understanding of controls, menus, toolbars, and dialogue boxes for creating user-friendly interfaces.
- Competence in testing and debugging VB applications to ensure their functionality.
- Knowledge of data access objects (DAO), remote data objects (RDO), and Active X data objects (ADO) for efficient data handling.
- Ability to generate data reports, utilize OLE controls, and work with automation servers in VB.
- Understanding the use of Active X controls, creating executable files (EXE), Dynamic Link Libraries (DLL), and document files.
- Completion of a minor project, showcasing practical application of VB concepts and skills.

5. E-Commerce / Business

- Upon completion THE course, students will attain a comprehensive understanding of electronic commerce, covering its definition, aims, processes, tools, and results. They will explore Electronic Data Interchange (EDI), Value-Added Networks (VANs), and the internet as promoters of E-Commerce.
- The course delves into different types of E-Commerce, including Commerce-net, and provides insights into the steps involved in initiating an online business, encompassing hardware and software requirements.
- The EDI section compares EDI with traditional systems, explores its role in the procurement process, and addresses the components and implementation issues of an EDI system.
- Concerns for E-Commerce growth are discussed, covering technological, legal, and regulatory challenges, along with issues related to internet bandwidth and technology.

- Students will gain knowledge of the National Information Infrastructure (NII), including technical standards, services, and challenges in securing electronic transactions.
- The implementation of digital signatures, authentication mechanisms, and the legal considerations of electronic cash will be explored.
- The course also covers business process re-engineering (BPR) methodologies and planning methods for transitioning to E-Commerce and EDI.
- Real-world case studies demonstrate the practical applications of E-Commerce in various business areas, including banks, reservations, E-Governance, supply chain management, manufacturing, retailing, and online publishing.