

Session 2020-21

# Programme and Course Outcome

**B.Sc Computer Science (CS)**



***Multani Mal Modi College,  
Patiala***

## **Program Outcomes (POs)**

The student graduating with the B.Sc (CS) degree would be able to acquire and demonstrate the following:

- 1. Core competency:** Students will attain core competency in the subjects of Maths, Physics and Computer Science.
  - Demonstrate comprehensible understanding of the fundamental concepts of computer science, physics and mathematics including their different subfields.
  - Acquire technical knowledge that creates different types of professionals in the fields of computer, physics and mathematics and related fields such as industry, teaching, research and development, environmental monitoring, material sciences and government/public service, in banking, insurance and investment sectors etc.
  - Utilize suitable approaches to perform understand the characterization of physics and mathematical based analyses; and apply relevant knowledge and skills to find solutions to problems that arise from these fields of computer physics and mathematics.
  - Students will be able to apply the basic principles of working of equipment and instruments and undertake hands on lab work and practical activities which enhances their problem solving abilities required for successful career in various fields or for higher degrees.
- 2. Analytical ability:** Students will develop skills to pay attention to all elements and will be able to construct logical arguments related to their subjects. They will be able to design a hypothesis, collect data and analyze it critically to decipher if the data supports the hypothesis.
- 3. Disciplinary knowledge and skill:** Students will be able to demonstrate inclusive knowledge and understanding of all three subjects of computer, physics, and mathematics and utilize their lab and technical skills in interdisciplinary applications of these subjects.
- 4. Communication skill:** On completion of this course, students would be trained to carefully listen, read and analyze the experimental data/research papers and express it through technical writing as well as orally in a concise manner.
- 5. Critical thinker and problem solver:** The course is designed in such a manner that it enables the students to develop critical thinking ability required to solve inter-disciplinary problems/numerical using basic knowledge and concepts.
- 6. Sense of inquiry:** The students are able to develop inquisitive characteristics such as investigative skills and independent investigation of subject-related issues and problems through questioning, planning and reporting their investigation.

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7. **Team player:** The course is designed in such a way so as to train the students to work as a team player in a laboratory or industry and also to work independently for writing projects and carrying out research.
8. **Skilled project manager:** A BSc CS graduate student will be capable of being a project manager by gaining knowledge about mathematics, computer and physics. Student will be efficient in planning, writing and studying the ethical standards and rules concerning to scientific project management.
9. **Digitally literate:** The course enables the student to acquire digital skills and carry out data analysis using various apps and software, use library search engines and simulation software to carry out computational work.
10. **Ethical awareness and reasoning strengthening:** A student after graduation in this course would be able to depict ethical awareness and reasoning. The student will be more objective and unbiased in all aspects of work and avoid unethical behavior such as fabricating or falsifying or misrepresenting any experimental data or commit any plagiarism; the student would be sensitized to appreciate intellectual property rights and other environmental and sustainability concerns.
11. **Lifelong learner:** The syllabus is planned to instill a practice of continuous learning among the students through various tools and technique such as ICT, books and journals for individual academic growth and future jobs.

**Course Outcomes (COs)**

**Course Outcomes: Mathematics**

## **Programme & Course Outcomes of B.Sc CS (Session 2020-21)**

### **Semester-I**

Paper-I	Calculus-I
Paper-II	Differential Equations
Paper-III	Co-ordinate Geometry

### **Semester-II**

Paper-IV	Algebra- I
Paper-V	Partial Differential Equation
Paper-VI	Analytic Geometry

**Course Outcomes:** After Completion of the course the student will be able to:

### **Semester-I**

#### **Paper-I : Calculus-I**

**CO 1:** Understand the concept of derivatives and use it to find curvature.

**CO 2:** Understand and apply the concept of limit, continuity of a function at a point to find Concavity and convexity, Asymptotes and Tracing of curves.

**CO 3:** Exhibit and recall previous learning in integrals and use to study Improper integrals.

**CO 4:** Apply and deduce Area and volume of two dimensional surfaces.

**CO 5:** Investigate convergence and divergence of Improper integrals, Dirichlet integrals and some special functions.

#### **Paper-II: Differential Equations**

**CO-1:** Recognize various definitions of linear homogeneous and nonhomogeneous differential equations.

**CO-2:** Understand various methods to solve second order linear differential equation with constant and variable coefficients.

**CO-3:** Obtain power series solutions of several important classes of ordinary differential equations including Bessel's, Legendre differential equations. Also able to derive the generating functions and recurrence relations, orthogonality properties and interpret their qualitative behaviour.

**CO-4:** Discover the use of Bessel, Legendre's, Hermite's equations in real-life problems.

#### **Paper-III: Coordinate Geometry**

**CO-1:** Understand and recall the importance of general equation of second degree in co-ordinate geometry.

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**CO-2:** Obtain tangent, normal, chord of contact, and other geometrical properties.

**CO-3:** Apply above geometrical properties in real-life problems

**CO-4:** Investigate the nature of second degree equation of a curve.

**CO 5:** Demonstrate their knowledge of geometry and its applications in the real world.

### **Semester-II**

#### **Paper-IV: Algebra- I**

**CO 1:** Recognize consistent and inconsistent systems of linear equations by the row echelon

form of the augmented matrix, using rank.

**CO 2:** Find eigenvalues and corresponding eigenvectors for a square matrix

**CO 3:** Understand the importance of roots of polynomials and learn various methods of obtaining roots.

**CO 4:** Employ De Moivre's theorem in several applications to solve numerical problems.

**CO 5:** Execute their good understanding of the deeper concepts of linear algebra and abstract algebra.

#### **Paper-V: Partial Differential Equation**

**CO 1:** Solve the first-order linear PDE's with the aid of Lagrange's method and non-linear PDEs of first order with Charpits' method.

**CO 2:** Derive solutions of linear PDEs of second and higher order with constant coefficients.

**CO 3:** Use the method of separation of variables and other techniques to solve some basic hyperbolic, parabolic and elliptic partial differential equations.

**CO 4:** Execute their learning in solving heat, wave, Laplace equations.

**CO 5:** Solve PDE governing real life phenomenon arising in various fields of science and engineering.

#### **Paper-VI: Analytic Geometry**

**CO 1:** Understand and apply appropriate techniques, tools, and formulae to determine various geometrical parameters.

**CO 2:** Find Equation of a tangent plane, Condition of tangency, Angle of the intersection of two spheres, Length of a tangent, Radical plane, Coaxial system of spheres and other geometrical properties

**CO 3:** Analyze characteristics and properties of two- and three-dimensional geometric shapes and their geometric relationships.

**CO 4:** Relate and integrate geometry into real life contexts as well as into other disciplines.

**Semester-III**

Paper-I	Advanced Calculus
Paper-II	Analysis-I
Paper-III	Statics

**Semester-IV**

Paper-IV	Numerical Methods
Paper-V	Analysis-II
Paper-VI	Dynamics

**Course Outcomes:** After completion of the course the student will be able to:

**Semester-III**

**Paper-I: Advanced Calculus**

**CO 1:** Understand the concept of Limit, Continuity of Functions of several variables. Differentiability of real-valued functions of two variables.

**CO 2:** Understand the use of partial derivatives in Taylor's theorem, error estimation, and to Find Maximum and Minimum values of real-life situations.

**CO 3:** Exhibit and recall previous learning in Calculus of one variable

**CO 4:** Apply the concept of multiple Integrals to evaluate Areas, Volume, Centre of Gravity and Moments of Inertia and other physical quantities.

**CO 5:** Develop and execute their understanding to solve differential equations.

**Paper-II: Analysis-I**

**CO 1:** Understand the concept of Function of Bounded Variations and Riemann Integration

**CO 2:** Analyze and relate sequences and series of real values functions in terms of convergence in and divergence in  $R^2$ .

**CO 3:** Implement logical thinking to prove the basic results of real analysis.

**CO 4:** Relate the concept of infinite series and Improper Integrals.

**CO 5:** Develop and execute these concepts to probability theory, Fourier series, and other branches of mathematics.

**Paper-III: Statics**

**CO 1:** Understand the necessary conditions for equilibrium of particles acted upon by the number of forces.

**CO 2:** Understand the reduction of force system to a resultant force and a resultant couple.

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**CO 3:** Define and determine the center of gravity of some materialistic systems.

**CO 4:** Demonstrate the concept of friction and identify types of friction.

**CO 5:** Formulate the knowledge of statics to higher courses like the theory of elasticity, fluid mechanics etc.

### **Semester - IV**

#### **Paper-IV: Numerical Analysis**

**CO 1:** Understand the errors, source of error and its effect on any computation.

**CO 2:** Obtain numerical solutions of algebraic and transcendental equations.

**CO 3:** Tabulate the functions and data set using interpolation.

**CO 4:** Apply course knowledge to solve complicated physical problems by approximating to the desired accuracy.

#### **Paper-V: Analysis-II**

**CO 1:** Understand the Concept of Point-wise and Uniform convergence of sequence and series of functions with special reference to power Series.

**CO 2:** Identify and discuss the convergence of sequence and series of functions

**CO 3:** Evaluate Line, surface and volume integrals

**CO 4:** Identify and apply Greens Theorem, Stokes Theorem, and the Divergence Theorem.

**CO 5:** Investigate the Theory of Vector Calculus with relevant examples.

#### **Paper-VI: Dynamics**

**CO 1:** Understand the laws of motion and dynamics involved in projectile motion, Simple Harmonic function etc.

**CO 2:** Understand the concepts of work, power, energy, momentum and relative motion.

**CO 3:** Apply the laws of motion to solve physical problems.

**CO 4:** Investigate and formulate the concept of mathematical modeling in projectile motion.

**CO 5:** Use and derive some of the basic definitions and theorems related to dynamics.

### **Semester-V**

**Programme & Course Outcomes of B.Sc CS (Session 2020-21)**

Paper-I	Algebra-I
Paper-II	Discrete Mathematics-I
Opt-I	Mathematical Methods-I
Opt-II	Number Theory-I

**Semester-VI**

Paper-III	Algebra-II
Paper-IV	Discrete Mathematics-II
Opt-III	Mathematical Methods-II
Opt-IV	Number Theory-II

**Course Outcomes:** After completion of the course the student will be able to:

**Semester-V**

**Paper-I: Algebra-I**

**CO-1:** Determine whether a given set and binary operation form a group by checking group axioms

**CO-2:** Understand and Differentiate between homomorphism and isomorphism for groups and Rings.

**CO-3:** Differentiate between dihedral, symmetric and alternating groups, rings, derive the existence of groups of a specified small order

**CO-4:** Develop new structures based on given structures and compare the structures.

**CO-5:** Implement abstract and critical reasoning by studying logical proofs and the axiomatic method as applied to modern algebra.

**Paper-II: Discrete Mathematics-1**

**CO-1:** Understand and Define basic notations in graph theory & trees.

**CO-2:** Construct the Passwords by using the techniques of counting principles

**CO-3:** Use the shortest path algorithm to determine the fastest driving routes.

**CO-4:** Construct Model problems in Computer Science using graphs and trees.

**CO-5:** Learn how to work with some of the discrete structures which include sets, relations, functions, graphs and trees.

**CO 6:** Solve real-life problems using finite-state machines.

**CO-7:** Assimilate various graph theoretic concepts and familiarize them with their applications.



**Opt-I: Mathematical Methods I**

**CO-1:** Demonstrate their understanding of the Dirichlet conditions.

**CO-2:** Solve both real and complex forms of the Fourier series for standard periodic waveforms

**CO-3:** Know about piecewise continuous functions, Dirac delta function, Laplace transforms

and its properties

**CO 4:** Investigate the application of course in various engineering fields.

**Semester-VI**

**Paper-III: Algebra- II**

**CO-1:** Understand real vector spaces, subspaces, basis, dimension, and their properties

**CO-2:** Use the definition and properties of linear transformations and matrices of linear transformations.

**CO 3:** Obtain various variants of diagonalization of linear transformations.

**CO-4:** Apply the knowledge of linear algebra to solve the system of differential equations.

**CO-5:** Explain the use of linear algebra in coding theory, linear programming, and cryptography.

**Paper-IV: Discrete Mathematics-II**

**CO 1:** Understand and solve Binary relations and recurrence relations, direct and indirect proofs.

**CO 2:** Construct mathematical arguments using logical connectives and quantifiers.

**CO 3:** Validate the correctness of an argument using statement and predicate calculus.

**CO 3:** Develop an inductive way of thinking.

**CO 4:** Interpret and investigate applications of Boolean algebra and Boolean functions, logic gates, switching circuits in electronics.

**Opt-III: Mathematical Methods-II**

**CO-1:** Understand Fourier Transform and inverse Fourier transform.

**CO-3:** Determine the solution of differential equations with initial and boundary value problems by choosing the most suitable method.

**CO-4:** Apply Laplace transform techniques to solve Heat, Wave & Laplace equations.

**CO 5:** Apply and formulate integral transform techniques applied to various situations in physics, engineering, and other mathematical contexts.

**Course Outcomes: Physics**

**Course Title: MECHANICS**

The aim of the course is to acquaint students with the fundamentals of mechanics.

After completion of this course, students will be able to:

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1. Understand various co-ordinate systems, reference frames, conservation laws, motion of rigid body and special theory of relativity.
2. Apply conservation laws to collisions in various frames and to kinematics of rigid bodies.
3. Analyze the problems in mechanics on motion and characteristics of trajectory.
4. Fix the problems faced in experiment handling and modeling computations for physical systems.

### **Course Title: Waves & Vibrations**

This course aims to enhance the student's understanding regarding the theory of waves, vibrations and electromagnetism. At the end of the course, the student will be able to:

1. Understand different oscillators and their characteristic parameters, physical significance of Maxwell's equations, wave equations in different media and their solutions.
2. Analyze differential equations, stiffness of coupled oscillators, inductance coupling of electrical oscillators.
3. Gain an appreciation of the wide applicability of the presented concepts and acquire practical skills with experiments and related numerical problems, which are applicable to daily life and higher studies.

### **Course Title: ELECTRICITY & MAGNETISM**

In this course, students attain the necessary knowledge, skills and general competency in Electricity & Magnetism. With the completion of the course the students will be able to:

1. Understand fundamental basics of electrical circuits, properties of simple, time-dependent electric & magnetic fields, induction, Maxwell's equations, electromagnetic waves.
2. Apply the basics to calculate forces and fields in various electricity & magnetism problems.
3. Analyze problems in electromagnetism using mathematical methods and compute currents and voltage drops in circuits.
4. Evaluate the importance of electricity & magnetism in society with regard to technological applications with concrete examples.
5. Have a basic grip on how experimental equipment can be used (this is achieved via lab-exercises). Students can familiarize with working of electrical circuits and storage devices. The theoretical and practical knowledge enables them to identify different communication techniques which will be useful in their daily life and higher studies.

### **Course Title: STATISTICAL PHYSICS AND THERMODYNAMICS**

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At the end of the course student will be competent to:

1. Understand various laws of thermodynamics, basics of probability, macrostates, microstates & distribution of particles, importance of quantum effects besides classical systems, concept of phase space, Maxwell Boltzmann, Bose Einstein, Fermi Dirac statistics and particles involved in reference to their spin.
2. Apply the laws to calculate the efficiency of idealized engines like Carnot Cycle.
3. Analyze the advancements in heat engines, refrigeration etc. and their application in daily life.
4. Evaluate the knowledge by performing lab experiments. Acquire a foundation for analyzing many body problems in advanced courses in physics.

### **Course Title: OPTICS & LASERS**

The main objective of this course is to equip the students with deep understanding of various phenomena of wave optics and Laser technology. After the completion of the course, students will be able to:

1. Understand the physics involved in the wave optics phenomena: Interference, diffraction and polarization and their role in working of optical instruments.
2. Learn properties, construction and applications of different types of lasers. To equip with the basics of holography.
3. Apply the basics to calculate resolving power of optical devices and beam profile in lasers.
4. Analyze the problems of wave optics and progress in interferometry, laser technology and holography.
5. Evaluate the role of interference, diffraction and polarization in daily life and in nature with real examples.
6. Have an acquaintance on handling and use of optical instruments (exercised through lab practice). The theoretical and practical knowledge will facilitate them to decide a course for them in higher education or optoelectronic applications.

### **Course Title: QUANTUM MECHANICS**

On successful completion of this course the student will be able to:

1. Understand the need and principles of quantum mechanics, duality of matter, Schrödinger's equations and Uncertainty principle.
2. Apply Schrödinger equation for study of one to three dimensional systems and develop reasoning for mathematical results. Employ concepts of angular

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momentum and spin to account for the phenomena involved in the Zeeman effect and LS coupling,

3. Analyze systems of identical particles based on quantum mechanics.
4. Use analytical and mathematical methods on quantum mechanical problems. Design and carry out experiments and compare results with theoretical predictions.

### **Course Title: CONDENSED MATTER PHYSICS**

This course aims to enhance the student's basic knowledge in the discipline of Condensed Matter Physics. At the end of the course, the student will be able to:

1. Understand crystal structures, crystal planes, crystal diffraction, and experimental methods for crystal structure studies, concepts and various theories related to lattice vibrations, phonons, metals and semiconductors.
2. Apply theoretical knowledge in various problems of condensed matter physics.
3. Analyze the role of reciprocal lattices and Brillouin zones in crystallography.

### **Course Title: NUCLEAR AND PARTICLE PHYSICS**

After the successful completion of this course the students will get well versed with the key concepts of nuclear and particle physics and will be able to

1. Learn fundamental aspects of nucleus & nuclear models, Radioactive decay, Nuclear Reactions and the interaction of radiation with matter, classification of elementary particles, detectors & accelerators.
2. Apply nuclear and particle physics concepts in kinematical computations, detectors.
3. Analyze various nuclear experiments to calculate nuclear parameters (lab exercise).

### **Course Title: ELECTRONICS (ELECTRONICS AND SOLID STATE DEVICES)**

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

1. Understand the concepts of semiconductor devices, biasing techniques and V-I characteristics, rectifiers, characteristics of different types of photoconductive devices.
2. Analysis of efficiency and ripple factor in filter circuits, different configurations of a transistor.
3. Evaluate the need of the circuitry, skills and technological tools and their advancements in relation to societal needs.
4. Design and operate electronics circuits.

**Computer**

**First Semester**

**Fundamental of Information Technology**

**Upon the completion of the course the learner will be able to**

**PO-1:** Familiarization with the types of computer, peripheral devices, memory management, multimedia and number system.

**PO-2:** Learn about working of various input and output devices.

**PO-3:** Learnt about binary number representation along with its operations.

**PO-4:** Understand theoretical framework of internet and associated application of the internet.

**PO-5:** Acquire the knowledge about the binary number representation along with its operations.

**PO-6:** Understand of the role of computers in business, education and society.

**Computer**

**Second Semester**

**MS-OFFICE AUTOMATION TOOLS**

**After completion of this course, students will be able to:**

**CO-1:** Have basic knowledge of computer Hardware and Software.

**CO-2:** Understand business areas to which computers may be applied.

**CO-3:** Installation of Operating System (Windows), application software and to use Windows OS.

**CO-4:** Provide practical knowledge to Office tools (MS Word, Excel and Power Point).

**CO-5:** Use of MS-Word to type documents with various formatting.

**CO-6:** Creating and manipulating Datasheets for different applications.

**CO-7:** Designing effective presentations using Power Point software

**Computer**

**Third Semester**

**C PROGRAMMING AND DATA STRUCTURES**

**After completion of this course, students will be able to:**

**CO-1:** Understand of various concepts of programming language.

**CO-2:** Develop logics and analytical ability solve problem.

**CO-3:** Learn about procedural programming using functions.

**CO-4:** Acquired various flow control statements.

**CO-5:** Learn about various storage classes along with user defined data types.

**CO-6:** Acquire knowledge of file handling

**CO-7:** Work with arrays of complex structure data types.

**CO-8:** Understanding a concept of functional hierarchical code organization

**Computer**

**Fourth Semester**

## **DATABASE MANAGEMENT SYSTEM**

**Upon the completion of the course the learner will be able to**

**CO-1:** Familiarization with various features and applications of Database Management system.

**CO-2:** Acquire knowledge about database languages (DDL, DML, DCL)

**CO-3:** Learn how to design a database by using different data models.

**CO-4:** Understand the database handling during execution of the transactions along with concurrent access.

**CO-5:** Ability to perform various typ

es of SQL queries.

**CO-6:** Able to design a good database using normalization, decomposition and functional dependency

## **Computer**

### **Fifth Semester**

#### **OBJECT ORIENTED PROGRAMMING USING C++**

**After completion of this course, students will be able to:**

**CO-1:** Understand the intricacies of Object Oriented Programming including the features and peculiarities of the C++ programming language.

**CO-2:** Illustrate the concept of Inheritance, operator overloading, and polymorphism.

**CO-3:** Implement various objects oriented concepts to solve practical problems.

**CO-4:** Apply the concepts of OOPs using C++ in programming.

## **Computer**

### **Sixth Semester**

#### **Introduction to Computer Network and Internet Programming**

**After completion of this course, students will be able to:**

**CO-1:** Write and debug webpage using HTML.

**CO-2:** Knowledge and Use of web publishing and phases related with the website development.

**CO-3:** Make use of knowledge related to links, addresses, images, and tables.

**CO-4:** Knowledge of various formatting options on HTML page and web site.

**CO-5:** Knowledge of Server Side programming.

## **Course Outcomes: English**

### **SEMESTER -III**

**After completing this course the student will be able to:**

**CO-1:** to learn the skills for reading and writing fiction and plays.

**CO-2:** to go with the field of screenplay and drama writing.

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**CO-3:** to create a fictional short stories after going through fictional studies and prose.

**CO-4:** to learn the difference between real and reel world.

**CO-5:** to learn new communication skills with dialogues of the plays.

**CO-6:** to participate in theater programs and can also learn dialogue writing.

**SEMESTER -IV**

**After completing this course the student will be able to:**

**CO-1:** Learners will think critically, while they read anything in future.

**CO-2:** Learners will participate in essay writing and non-fiction writing competitions.

**CO-3:** Learners will do official works easily and can work as an editor.

**CO-4:** Learners will elaborate any passage or sentence into a long work with the help of précis writing.

**CO-5:** Learner will communicate in more than one language with the help of translation portion.

**Course Outcomes: Punjabi**

**ਬੀ.ਐਸ.ਸੀ. (ਨਾਨ-ਮੈਡੀਕਲ) ਭਾਗ ਪਹਿਲਾ ਸਮੇਸਟਰ ਪਹਿਲਾ ਦੀ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਵਿਸ਼ੇ ਦੀ ਪੜ੍ਹਾਈ ਉਪਰੰਤ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਯੋਗਤਾ ਅਤੇ ਸਮਰਥਾ ਵਿਚ ਸਾਰਥਕ ਵਾਧਾ ਹੋਵੇਗਾ**

1. ਸਾਹਿਤਕ ਰਚਨਾਵਾਂ ਦੇ ਮਾਧਿਅਮ ਨਾਲ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਹੁੰਦਾ ਹੈ।
2. ਭਾਸ਼ਾ ਦੀ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ ਨਾਲ ਵਿਦਿਆਰਥੀ ਦੀ ਭਾਸ਼ਾਈ ਸਮਰੱਥਾ ਵਿਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ
3. ਸਮਾਜਕ ਵਾਤਾਵਰਣ ਤੇ ਸਭਿਆਚਾਰਕ ਵਿਸ਼ਿਆਂ ਸਬੰਧੀ ਗਿਆਨ ਦੀ ਪ੍ਰਾਪਤੀ ਹੋਵੇਗੀ।
4. ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਆਲੋਚਨਾਤਮਕ ਤੇ ਸਿਰਜਣਾਤਮਕ ਸੋਚ/ਪਹੁੰਚ ਦਾ ਵਿਕਾਸ ਹੋਵੇਗਾ ਜਿਸ ਨਾਲ ਉਹ ਸਮਾਜ ਪ੍ਰਤੀ ਜ਼ਿੰਮੇਵਾਰ ਹੁੰਦੇ ਹਨ।
5. ਮਨੁੱਖੀ ਹੋਂਦ ਦੇ ਸੰਕਟਾਂ ਦੀ ਨਿਸ਼ਾਨਦੇਹੀ ਅਤੇ ਉਹਨਾਂ ਦਾ ਯੋਗ ਹੱਲ ਲੱਭਣ ਦੇ ਸਮਰੱਥ ਹੋਣਗੇ।
6. ਵਿਦਿਆਰਥੀ ਆਪਣੇ ਵਿਚਾਰਾਂ ਨੂੰ ਲਿਖਿਤ ਅਤੇ ਮੌਖਿਕ ਰੂਪ ਵਿਚ ਵਿਅਕਤ ਕਰਨ ਦਾ ਹੁਨਰ ਹਾਸਲ ਕਰਨਗੇ।
7. ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਵਿਆਕਰਨਕ ਮੁਹਾਰਤ ਨਾਲ ਕਿਸੇ ਵੀ ਹੋਰ ਭਾਸ਼ਾ ਨੂੰ ਆਸਾਨੀ ਨਾਲ ਗ੍ਰਹਿਣ/ਸਮਝਣ ਦੀ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੋ ਜਾਂਦਾ ਹੈ।

**ਬੀ.ਐਸ.ਸੀ. (ਨਾਨ-ਮੈਡੀਕਲ) ਭਾਗ ਪਹਿਲਾ ਸਮੇਸਟਰ ਦੂਜਾ ਦੀ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਵਿਸ਼ੇ ਦੀ ਪੜ੍ਹਾਈ ਉਪਰੰਤ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਯੋਗਤਾ ਅਤੇ ਸਮਰਥਾ ਵਿਚ ਸਾਰਥਕ ਵਾਧਾ ਹੋਵੇਗਾ**

1. ਵਿਆਕਰਨਕ ਪੱਧਰ ਉੱਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨੂੰ ਸ਼ੁੱਧ ਰੂਪ ਵਿਚ ਉਚਾਰਨ, ਲਿਖਣ ਅਤੇ ਪੜ੍ਹਨ ਦਾ ਹੁਨਰ ਪੈਦਾ ਹੁੰਦਾ ਹੈ।



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2. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸ਼ਬਦ ਨਿਰਮਾਣ ਪ੍ਰਬੰਧ ਦਾ ਗਿਆਨ ਹੁੰਦਾ ਹੈ।
3. ਵਾਰਤਕ ਨਾਲ ਸਬੰਧਿਤ ਵਿਸ਼ੇ ਪੜ੍ਹਨ ਕਰਕੇ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਨਵੇਂ ਵਿਚਾਰ ਪੈਦਾ ਹੁੰਦੇ ਹਨ।
4. ਵੱਖ ਵੱਖ ਉਪਭਾਸ਼ਾਵਾਂ ਦੀ ਵੱਖਰਤਾ ਰਾਹੀਂ ਪੰਜਾਬ ਦੀ ਭਾਸ਼ਾਈ ਭਿੰਨਤਾ ਤੇ ਵਿਸ਼ਾਲਤਾ ਦਾ ਗਿਆਨ ਹੁੰਦਾ ਹੈ।
5. ਨਿਜੀ ਅਤੇ ਵਪਾਰਕ ਚਿੱਠੀ-ਪੱਤਰ ਰਾਹੀਂ ਸਰਲ ਪੇਸ਼ਕਾਰੀ ਅਤੇ ਸੰਚਾਰ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੁੰਦਾ ਹੈ।

**ਬੀ.ਐਸ.ਸੀ. (ਨਾਨ-ਮੈਡੀਕਲ) ਭਾਗ ਦੂਜਾ ਸਮੇਸਟਰ ਤੀਜਾ ਦੀ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਵਿਸ਼ੇ ਦੀ ਪੜ੍ਹਾਈ ਉਪਰੰਤ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਯੋਗਤਾ ਅਤੇ ਸਮਰਥਾ ਵਿਚ ਸਾਰਥਕ ਵਾਧਾ ਹੋਵੇਗਾ**

1. ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਗੌਰਵਮਈ ਇਤਿਹਾਸ ਦਾ ਗਿਆਨ ਹੁੰਦਾ ਹੈ।
2. ਸਾਹਿਤਕ ਰੂਪਕਾਰ ਨਾਵਲ ਰਾਹੀਂ ਜ਼ਿੰਦਗੀ ਦੀ ਵਿਸ਼ਾਲਤਾ ਨੂੰ ਸਮਝਣ ਦੀ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੁੰਦਾ ਹੈ।
3. ਵਾਕ ਬਣਤਰ ਦੇ ਗਿਆਨ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀ ਆਪਣੇ ਭਾਵਾਂ ਦਾ ਸੰਚਾਰ ਸੁਚੱਜੇ ਢੰਗ ਨਾਲ ਕਰ ਸਕਣਗੇ ਦੇ ਯੋਗ ਹੁੰਦੇ ਹਨ।
4. ਵਪਾਰਕ ਅਦਾਰਿਆਂ ਵਿਚ ਦਫਤਰੀ ਕੰਮਕਾਜ ਵਿਚ ਵਰਤੀ ਜਾਂਦੀ ਰਾਜ ਭਾਸ਼ਾ ਪੰਜਾਬੀ ਦੀ ਤਕਨੀਕੀ ਜਾਣਕਾਰੀ ਰਾਹੀਂ ਰੁਜ਼ਗਾਰ ਸੰਭਾਵਨਾਵਾਂ ਵਿੱਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ।
5. ਸਾਹਿਤਕਾਰ ਦੇ ਜੀਵਨ ਸਫ਼ਰ ਦਾ ਗਿਆਨ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਰਚਨਾਕਾਰ ਦੇ ਸਾਹਿਤਕ ਦ੍ਰਿਸ਼ਟੀਕੋਣ ਨੂੰ ਸਮਝਣ ਵਿੱਚ ਸਹਾਈ ਹੁੰਦਾ ਹੈ।

**ਬੀ.ਐਸ.ਸੀ. (ਨਾਨ-ਮੈਡੀਕਲ) ਭਾਗ ਦੂਜਾ ਸਮੇਸਟਰ ਚੌਥਾ ਦੀ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਵਿਸ਼ੇ ਦੀ ਪੜ੍ਹਾਈ ਉਪਰੰਤ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਯੋਗਤਾ ਅਤੇ ਸਮਰਥਾ ਵਿਚ ਸਾਰਥਕ ਵਾਧਾ ਹੋਵੇਗਾ**

1. ਕਵਿਤਾ ਨੂੰ ਪੜ੍ਹਦਿਆਂ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਲਪਨਾ ਸ਼ਕਤੀ ਦਾ ਵਿਕਾਸ ਹੁੰਦਾ ਹੈ।
2. ਕਵਿਤਾ ਦੁਆਰਾ ਵਿਦਿਆਰਥੀ ਸ਼ਾਬਦਿਕ ਅਤੇ ਪ੍ਰਸੰਗਿਕ ਅਰਥਾਂ ਤੋਂ ਜਾਣੂੰ ਹੁੰਦੇ ਹਨ।
3. ਸਾਹਿਤਕ ਲਹਿਰਾਂ ਦਾ ਗਿਆਨ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰਲੇ ਸਾਹਿਤਕ ਸਿਰਜਣਾ ਦੇ ਹੁਨਰ ਨੂੰ ਨਿਖਾਰਦਾ ਹੈ।
4. ਅਖਬਾਰੀ ਰਿਪੋਰਟ ਤਿਆਰ ਕਰਨ ਦਾ ਹੁਨਰ ਸਿੱਖ ਕੇ ਵਿਦਿਆਰਥੀ ਪੱਤਰਕਾਰੀ/ਮੀਡੀਆ ਦੇ ਖੇਤਰ ਵਿਚ ਰੁਜ਼ਗਾਰ ਪ੍ਰਾਪਤ ਕਰਦੇ ਹਨ।
5. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਪਿਛੋਕੜ ਦਾ ਗਿਆਨ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਮਾਂ ਬੋਲੀ ਦੇ ਮਾਣਯੋਗ ਮੁੱਲਾਂ ਨਾਲ ਜੋੜਦਾ ਹੈ।
6. ਗੁਰਮੁਖੀ ਲਿੱਪੀ ਦੀ ਵਿਕਾਸ ਪ੍ਰਕਿਰਿਆ ਬਾਰੇ ਪੜ੍ਹਦੇ ਹੋਏ ਵਿਦਿਆਰਥੀ ਭਾਸ਼ਾ ਅਤੇ ਲਿੱਪੀ ਦੇ ਆਪਸੀ ਸਬੰਧਾਂ ਨੂੰ ਸਮਝਦੇ ਹਨ।

**ਬੀ.ਐਸ.ਸੀ. (ਨਾਨ-ਮੈਡੀਕਲ) ਭਾਗ ਤੀਜਾ ਸਮੇਸਟਰ ਪੰਜਵਾਂ ਦੀ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਵਿਸ਼ੇ ਦੀ ਪੜ੍ਹਾਈ ਉਪਰੰਤ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਯੋਗਤਾ ਅਤੇ ਸਮਰਥਾ ਵਿਚ ਸਾਰਥਕ ਵਾਧਾ ਹੋਵੇਗਾ**

1. ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਸਾਹਿਤ ਦੇ ਪ੍ਰਯੋਜਨ ਅਤੇ ਤੱਤਾਂ ਦੀ ਜਾਣਕਾਰੀ ਸਿਰਜਣਾਤਮਕ ਰੁਚੀਆਂ ਦਾ ਵਿਕਾਸ ਕਰਦੀ ਹੈ।
2. ਸਾਹਿਤਕ ਰੂਪਕਾਰ ਨਾਵਲ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਜ਼ਿੰਦਗੀ ਦੀ ਵਿਸ਼ਾਲਤਾ ਅਤੇ ਮਨੁੱਖੀ ਅਸਤਿਤਵ ਦੇ ਸਮਕਾਲੀ ਅਤੇ ਚਿਰਕਾਲੀ ਸੰਕਟਾਂ ਨੂੰ ਸਮਝਣ ਦੀ ਯੋਗਤਾ ਦਾ ਵਿਕਾਸ ਹੁੰਦਾ ਹੈ।

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3. ਨਾਵਲ ਰੂਪਾਕਾਰ ਰਾਹੀਂ ਜੀਵਨ ਦੇ ਸਰੋਕਾਰਾਂ ਦੀ ਪੇਸ਼ਕਾਰੀ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਮਾਨਵੀ ਸੰਵੇਦਨਾ ਨੂੰ ਜਗਾਉਂਦੀ ਹੈ।
4. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸਿਧਾਂਤਕ ਸੰਕਲਪਾਂ ਦੀ ਜਾਣਕਾਰੀ ਵਿਹਾਰਕ ਭਾਸ਼ਾ ਦੇ ਸੰਗਠਨ ਨੂੰ ਸਮਝਣ ਵਿਚ ਸਹਾਈ ਹੁੰਦੀ ਹੈ।
5. ਵਿਭਿੰਨ ਸਮਾਜਕ, ਸਭਿਆਚਾਰਕ ਤੇ ਵਾਤਾਵਰਣਿਕ ਵਿਸ਼ਿਆਂ ਦਾ ਗਿਆਨ ਮੁਕਾਬਲੇ ਦੀਆਂ ਪ੍ਰੀਖਿਆਵਾਂ ਵਿਚ ਸਹਾਈ ਹੁੰਦਾ ਹੈ।

**ਬੀ.ਐਸ.ਸੀ (ਨਾਨ-ਮੈਡੀਕਲ) ਭਾਗ ਤੀਜਾ ਸਮੇਸਟਰ ਛੇਵਾਂ ਦੀ ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ ਵਿਸ਼ੇ ਦੀ ਪੜ੍ਹਾਈ ਉਪਰੰਤ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਯੋਗਤਾ ਅਤੇ ਸਮਰਥਾ ਵਿਚ ਸਾਰਥਕ ਵਾਧਾ ਹੋਵੇਗਾ**

1. ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਅਨੁਵਾਦ ਦੀ ਸਿਖਲਾਈ ਵਿਦਿਆਰਥੀਆਂ ਲਈ ਖੋਜ-ਕਾਰਜ ਵਿਚ ਸਹਾਈ ਹੁੰਦੀ ਹੈ।
2. ਸਿਵਲ ਪ੍ਰੀਖਿਆਵਾਂ ਵਿਚ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਅਧਿਐਨ ਉਹਨਾਂ ਨੂੰ ਮਜ਼ਬੂਤ ਆਧਾਰ ਪ੍ਰਦਾਨ ਕਰਦਾ ਹੈ।
3. ਟੈਕਨਾਲੋਜੀ ਦੇ ਦੌਰ ਵਿਚ ਹੁੰਦੇ ਹੋਏ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਲੋਕਧਾਰਾਈ ਰੂਪਾਂਤਰਣ ਦਾ ਬੋਧ ਹੁੰਦਾ ਹੈ।
4. ਵਿਦਿਆਰਥੀ ਪੰਜਾਬ ਦੀ ਲੋਕਧਾਰਾ/ਸਭਿਆਚਾਰ ਬਾਰੇ ਪ੍ਰਾਪਤ ਗਿਆਨ ਰਾਹੀਂ ਆਪਣੀਆਂ ਪਰੰਪਰਾਵਾਂ ਦਾ ਸਮਕਾਲ ਨਾਲ ਵਰ ਮੇਚ ਕੇ ਮੁਲਾਂਕਣ ਕਰਨ ਦੇ ਸਮਰੱਥ ਹੋ ਜਾਂਦੇ ਹਨ।
5. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਵਿਆਕਰਨਕ ਸੰਗਠਨ ਵਿਚ ਕਾਰਜਸ਼ੀਲ ਤਕਨੀਕੀ ਪੱਖਾਂ ਦੀ ਜਾਣਕਾਰੀ ਉਹਨਾਂ ਨੂੰ ਮਿਆਰੀ ਭਾਸ਼ਾ ਵਿਚ ਸਿਰਜਣਾ ਕਰਨ ਦੇ ਸਮਰੱਥ ਬਣਾਉਂਦੀ ਹੈ।