SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

P.G. Department of Computer Science

SESSION: 2023-24

Post Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Programme Name: M.Sc. (IT)

Programme Outcomes:

1) The M.Sc. (IT) Programme is designed to equip post graduate students with an integrated set of skills that will allow them to develop their professional careers in this area of information technology.
2) The focus of the Programme is to equip students with the theoretical and practical that is necessary to enable them to practical knowledge in the design of complex Computer applications/science.
3) The Programme not only presents the knowledge in the design and implementation of computer applications but also prepares students to embrace future developments in the field and has a demonstrated professional relevance.
4) Thus, the M.Sc. (IT) Programme is intended to prepare post graduates to pursue careers in industry, as software engineers, to establish their own consulting or software development companies.

Programme Specific Outcomes:

1) Demonstrate a comprehensive understanding of the broad themes in Information Technology.
2) Use and apply current technical concepts and practices in the core information technologies of networking, data management, software engineering etc.
3) Demonstrate a deep understanding of the IT methodologies and frameworks used to solve complex computing problems related to at least one IT Body-of-Knowledge.
4) Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.

5) Effectively integrate IT-based solutions into the user environment.
6) Developed and implement optimal solutions to complex computing problems using industry-recognized best practices and standards.
7) Apply ethical decision makingin the development, implementation and management of IT systems.

Course outcomes

Semester I

MS-111 Computer Fundamentals

Course Outcomes: On completion of this course, the students will be able to:

1) Have basic knowledge of computer hardware and software and e-technology.
2) Understand business areas to which computers may be applied.
3) Provide an introduction to business organization and information systems.
4) Develop the skills in communication, verbal and written, which play an important part in business computing and information processing.

MS-112 Computer Programming using C

Course Outcomes: On completion of this course, the students will be able to:

1) Write, compile and debug programs in C language.
2) Use different data types, operators and console I/O function in a computer program.
3) Design programs involving decision control statements, loop control statements and case control structures.
4) Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
5) Comprehend the concepts of structures and union.
6) Use the basic file operations.

MS-113 Computer Organization and Architecture

Course Outcomes: On completion of this course, the students will be able to:

1) Understand the basics of computer hardware and how software interacts with computer h ardware.

2) Analyze and evaluate computer performance.
3) Understand how computers represent and manipulate data.
4) Understand computer arithmetic and convert between different number systems.
5) Assemble a simple computer with hardware design including data format, instruction for mat, instruction set, addressing modes, bus structure, input/output, memory, Arithmet ic/Logic unit, control unit, and data, instruction and address flow.
6) Use Boolean algebra as related to designing computer logic, through simple combination al and sequential logic circuits.

MS-115 Operating Systems

On completion of this course, the students will be able to:

1) Learn the mechanisms of OS to handle processes and threads and their communication. Use different data types, operators and console I/O function in a computer program.
2) Learn the mechanisms involved in memory management in contemporary OS.
3) Gain knowledge on distributed operating system concepts that includes architecture, deadlock detection algorithms and agreement protocols.
4) Understand different approaches to memory management. Understand the structure and organization of the file system.

MS-117 E2 Quantitative Aptitude & Reasoning

1) This course provides the students with an understanding of deductive and inductive reasoning
2) To make students understand both Verbal and Non Verbal Reasoning.
3) To practice various quantitative aptitude question.

Semester II

MS-121 Object Oriented Programming Using C++

On completion of this course, the students will be able to:

1) Write, compile and debug programs in C++ language.
2) Use different data types, operators and console I/O function in a computer program.
3) Design programs involving decision control statements, loop control statements and case control structures.

4) Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
5) Comprehend the concepts of structures and classes: declaration, initialization and implementation.
6) Apply basics of object oriented programming, polymorphism and inheritance.
7) Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.

MS-122 Data and File Structures

On completion of this course, the students will be able to:

1) Be familiar with basic data structure of algorithms. Design and analyze programming problem statements
2) Choose appropriate data structures and algorithms and use it to design algorithms for a specific problem.
3) Handle operations like searching, insertion, deletion and traversing mechanism
4) Come up with analysis of efficiency and proofs of correctness

MS-123 Software Engineering

1) Basic knowledge and understanding of the analysis and design of complex systems.
2) Ability to apply software engineering principles and techniques.
3) Ability to develop, maintain and evaluate large-scale software systems.
4) To produce efficient, reliable, robust and cost-effective software solutions.
5) Ability to perform independent research and analysis.
6) To manage time, processes and resources effectively by prioritising competing demands to achieve personal and team goals Identify and analyzes the common threats in each domain.
7) Ability to understand and meet ethical standards and legal responsibilities.

MS-124 RDBMS and Oracle

On completion of this course, the students will be able to:

1) Gain the knowledge and understanding of Database analysis and design. Understand the use of Structured Query Language(SQL) and learn SQL syntax.

2) Gain the knowledge of the processes of Database Development and Administration using SQL and PL/SQL.
3) Understand the functional dependencies and design of the database. Understand the concept of Transaction and Query processing.

MS-127 E2 Workshop on Adobe Photoshop

At the completion of this course you should be able to:

1) work with the Photoshop workspace
2) navigate images, resize and crop images
3) make and work with selections
4) create new layers and perform other basic layer functions
5) transform images, make various colour corrections using adjustment layers
6) use various retouching and repairing techniques to correct images
7) use layer masks, filters and blending modes
8) apply layer effects and save them as a style
9) create, edit and work with text

M. Sc. (IT) Part-2 / M.Sc.(IT)(LE)

Semester III

MS-211 Web Technology

Outcomes:

1) Students are able to develop a dynamic webpage by the use of java script and PHP .
2) Students will be able to connect a Php program to a DBMS and perform insert, update and delete operations on DBMS table.
3) Students will be able to write a well formed / valid XML document.
4) Students will be able to write a server side application to catch data sent from client and store it on database.
5) Students will able to handle files, exception using Php in dynamic webpages.

MS-212 Java Programming

Outcomes:

1) Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
2) Understand the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods etc and exception handling mechanisms.
3) Understand the principles of inheritance, packages and interfaces.
4) Develop and understand exception handling, multithreaded applications with synchronization.
5) Design GUI based applications and develops applets for web applications.
6) Understand event handling and use different AWT components for designing GUI interface.

MS-213 Computer Networks

Outcomes:

1) Build an understanding of the fundamental concepts of computer networking.
2) Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
3) Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.
4) Understand the architectural principles of computer networking and compare different approaches to organising networks.
5) Familiarize the student with the basic taxonomy and terminology of the computer networking area
6) Understand good network design: simplicity, scalability, performance, and the end-to-end principle.
7) Understand how the Internet works today.
8) Judge the effectiveness of existing or similar network protocols.
9) Be conversant with primitives of network application programming.

MS-214 Management Information Systems

Outcomes:

1) To introduce the fundamental principles of computer-based information systems analysis and design and develop an understanding of the principles and techniques used.
2) To enable the students to use information to assess the impact of the Internet and Internet technology on electronic commerce and electronic business and understand the specific threats and vulnerabilities of computer systems.
3) To provide the theoretical models used in database management systems to answer business questions.
4) To understand the basic principles and working of information technology.
5) Describe the role of information technology and information systems in business.
6) To give an overall perspective of the importance of application of internet technologies in business administration.

MS-217 CBC-III Workshop on Python Programming

Outcomes:

1) Install and run the Python interpreter
2) Create and execute Python programs
3) Understand the concepts of List and functions.
4) To acquire programming skills in core Python.
5) To acquire Object Oriented Skills in Python
6) To understand the various String and formatting methods.
7) To provide knowledge and experiences to students that serve as a foundation for continued learning of presented areas.

Semester IV

MS-221 Computer Graphics

Outcomes:

1) To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.
2) To learn the basic principles of 3- dimensional computer graphics.
3) Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.

4) Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.
5) To be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.

MS-222 Linux Administration

Outcomes:

1) Introduces the student to the Linux Operating system with particular emphasis on command line tools, utilities and shell scripting.
2) The student will learn and apply the various commands and utilities related to file system management, process management, program development and data processing.
3) The student will apply the aforementioned utilities and concepts in the writing of shell scripts.
4) The students will learn to configure X windows, system Administration and networking skills using linux.

MS-223 Research Methodology

Outcomes:

1) Understand basic aspects of research, its types and its scope and formulation
2) Have better understanding towards statistical methods used for research
3) Develop the skills to identify the appropriate statistical techniques for the analysis of data
4) Analyse the data using appropriate statistical tool
5) Learn how to collect, analyze, present and interpret research data.

MS-224 Artificial Intelligence

1) To present an overview of artificial intelligence (AI) principles and approaches.
2) Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning.
3) Students will implement a small AI system in a team environment.
4) Design a knowledge based system.
5) Familiar with terminology used in this topical area
6) Read and analyze important historical and current trends addressing artificial intelligence.

M.Sc. (AI &DS)

Programme outcomes:

M.Sc. in Artificial Intelligence is two year postgraduate course which concentrates on the development of systems for the integration of artificial intelligence through the various tools and Programming languages. Enrich the knowledge in the areas like Artificial Intelligence, Data Science and Machine learning. Students understand the artificial intelligence and data science with demonstration of all concepts with practicals and case studies. Develop in-house applications in terms of projects and case studies. The need for professionals in the artificial intelligence domain is in huge demand and the course makes the candidate learn much about the aspects of artificial intelligence and data science.

Programme specific outcomes:

1) Develop original ideas and solve complex problems in new or unfamiliar environments, based on advanced knowledge of the principles and methodologies of Artificial Intelligence and data science.
2) Integrate knowledge and handle complexity in this area of computer science, formulating sound judgments with incomplete or limited data.
3) Communicate conclusions and the underpinning knowledge and rationale clearly and unambiguously to specialist and non-specialist audiences.
4) Develop independent learning skills as required for continued professional development.

Course outcomes

Semester I

MSAIDS-111 Introduction to Artificial Intelligence

1) To present an overview of artificial intelligence (AI) principles and approaches.
2) Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning. Students will implement a small AI system in a team environment.
3) Understand the concepts of knowledge based system, expert system and different types of learning.
4) To know about various applications of AI.

MSAIDS-112 Python Programming

1) Install and run the Python interpreter
2) Create and execute Python programs
3) Understand the concepts of List ,Tuple, Dictionary, set ,functions and Modules.
4) To acquire programming skills in core Python.
5) To acquire Object Oriented Skills in Python
6) To understand the various String and formatting methods.
7) Able to work with files.
8) To understand the concept of Exception Handling.

MSAIDS-113 Data Structure & Algorithms

1) Understand and remember algorithms and its analysis procedure.
2) Demonstrate the use of data structures like linked lists , stacks ,queues ,trees and graphs.
3) To design and implement various data structure algorithms.
4) Apply the knowledge of data structures to a given problem.
5) Illustrate searching, sorting and hashing techniques.
6) Compute the complexity of various algorithms.

Semester II

MSAIDS-121 Introduction to Data Science

1) Understand concepts of Data Science its issues and challenges.
2) Able to understand data exploration concepts, feature selection and extraction.
3) To learn the representation of data in various forms.
4) Learn various data presentation and visualization techniques.

MSAIDS-124 E2 Digital Marketing

1) Be able to develop and execute a marketing plan, incorporating all elements of the marketing mix, segmentation and positioning strategies and other elements.
2) Have an understanding of the role of both digital and traditional media in marketing, and the intersection of online and offline strategies and tactics
3) Be able to guide the development of a digital presence from a marketing point of view.

4) Be proficient in marketing analytics and quantitative evaluation of the marketing environment.

MSAIDS-122 Machine learning with R

1) Learn the basics of R programming.
2) Student will become familiar with various machine learning techniques.
3) Able to learn about Classification techniques.
4) Able To learn about neural networks in machine learning.
5) Learn to combine multiple classifiers to get better result.

MSAIDS-124 E1 Data Warehousing & Mining

1) Understand the functionality of the various data mining and data warehousing component.
2) Understand the strengths and limitations of various data mining and data warehousing models and analyzing techniques of various data.
3) Able to Describe different methodologies used in data mining and data ware housing.
4) Able to Compare different approaches of data ware housing and data mining with various technologies.

MSAIDS-125 Workshop on Game Design and development

1) Gain practical experience in Python game development
2) Create game surfaces and main display screen
3) Create basic animation
4) Add sound effects to game
5) Position objects on screen using coordinates

Semester III

MSAIDS-211 Data Analysis using Python

Course Objectives: The main objectives of this course are:

1. To install and use Jupyter notebooks.
2. To demonstrate the basic and advanced concepts of Numpy and its various functions.
3. To introduce Pandas Series and Data Frames.
4. To introduce data manipulation and cleaning techniques using Pandas.

5. To demonstrate the loading of various formats and various data manipulation operations like data wrangling, group operations etc.

MSAIDS-212 Soft Computing

Course Objectives: The main objectives of this course are:

1. To introduce students to Soft Computing concepts and techniques.
2. To make the students familiar with architecture and various types of Neural Networks.
3. To introduce Fuzzy Logic, Architecture of Fuzzy Logic Systems and their applications.
4. To briefly introduce Genetic algorithms and its application areas.
5. To briefly explain Applications of Soft Computing.

MSAIDS-213 Digital Image Processing

Course Objectives: The main objectives of this course are:

1. To become familiar with digital image fundamentals.
2. To get exposed to simple image enhancement techniques in Spatial and Frequency domain.
3. To learn concepts of degradation function and restoration techniques.
4. To study the image segmentation and representation techniques.
5. To become familiar with image compression and recognition methods.

MSAIDS-214 Computer Network Technologies

Course Objectives:

1. Describe the general principles of data communication.
2. Describe how computer networks are organized with the concept of layered approach.
3. Implement a simple LAN with hubs, bridges and switches.
4. Describe how packets in the Internet are delivered.
5. Analyse the contents in a given data link layer packet, based on the layer concept.
6. Describe how routing protocols work.
7. To study various layers of OSI/TCP IP model.

Semester IV

MSAIDS-221 Research Methodology

Course Objectives: The main objectives of this course are:

1. To familiarize participants with basic of research and the research process.

2. To make the students identify appropriate research topics, select and define appropriate research problem and parameters.
3. To enable the participants in conducting research work and formulating research synopsis and report.
4. To enable the students to identify and discuss the complex issues inherent in selecting a research problem, selecting an appropriate research design and implementing a research project.
5. To develop an understanding of various research designs and techniques.
6. To identify various sources of information for literature review and data collection.

MSAIDS-222 Natural Language Processing using Python

Course Objectives: The main objectives of this course are:

1. This course introduces the fundamental concepts and techniques of natural language processing(NLP).
2. Teach students the leading trends and systems in natural language processing.
3. Make them understand the concepts of morphology, syntax, semantics and pragmatics of the language and that they are able to give the appropriate examples that will illustrate the above mentioned concepts.
4. Enable students to be capable to describe the application based on natural language processing.
5. Enable students to implement natural language processing using NLTK.

MSAIDS-223 Big Data Analytics

Course Objectives: The main objectives of this course are:

1. To optimize business decisions and create competitive advantage with Big Data analytics.
2. To explore the fundamental concepts of big data analytics.
3. To learn to analyze the big data using intelligent techniques.
4. To understand the various search methods and visualization techniques.
5. To learn to use various techniques for mining data stream.
6. To understand the applications using Map Reduce Concepts.

PGDCA (Post Graduate Diploma in Computer Application)

Programme outcomes:

The Post Graduate Diploma in Computer Application Programme will prepare its graduates to achieve:

1) Students are eligible to and apply for jobs in various multinational companies, industries, banks. They can start their own business in web development and software development.
2) Students are able to use their knowledge to develop different web and windows based applications.
3) Students can create database, websites and applications for their clients.

Programme specific outcome:

1) The understanding to apply knowledge of computing and technological advances appropriate to the Programme.
2) Skills to analyse a problem, and identify and define the logical modelling of solutions.
3) Analyze real world problems and use available technological solutions to design and implement the same.
4) Effectiveness in communicating with a wide range of audiences.
5) An ability to analyse the local and global impact of business solutions on individuals, organisations, and society.
6) An identification of the need to engage in continuing professional development.
7) The students acquire knowledge about basics and fundamentals of information technology, basic Programming. Students learn to develop and debug codes in different languages.

Course Outcomes

Semester I

PGDCA-101 Fundamentals of Information Technology

1) To identify all the important functional parts of a digital computer
2) To have an idea about the I/P, O/P, Primary and Secondary Storage Devices
3) To learn about the Number Systems and different Binary Arithmetic
4) To make the student understand about the Software, Internet basics and Different applications of IT.

PGDCA-102 Operating Systems

1) To introduce students with basic concepts of Operating Systems, its services and different types
2) To learn about the concept of Process Management and Deadlocks
3) To brief the students about the functionality of different operating systems like Windows and LINUX

PGDCA-103 Problem Solving Using C

1) An understanding of basic concepts of computer programming and developer tools.
2) An introduction to the syntax and semantics of the 'C' language as well as data types offered by the language.
3) An introduction to write programs using standard language infrastructure regardless of the hardware or software platform.
4) Write, compile and debug programs in C language and use different data types for writing the programs.
5) Understand the dynamic behavior of memory by the use of pointers.
6) Demonstrate the use of algorithms and flowcharts to plan the solution of a computing problem.

PGDCA-106 E2 Quantitative Aptitude & Reasoning

To make the students learn about the different concepts related to Data Interpretation and Reasoning such as Mathematical & Logical Reasoning.

Semester II

PGDCA-201 Database Management System

1) To make student understand the role of a database management system in an organization
2) Understand basic database concepts, including the structure and operation of the relational data model
3) Construct simple database queries using Structured Query Language (SQL)
4) Understand and successfully apply logical database design principles, including E-R diagrams and database normalization
5) Understand the role of the database administrator.

PGDCA-202 Introduction to Computer Networks & E-Commerce

1) To provide students with an overview of the concepts and fundamentals of data communication and computer networks
2) To familiarize with the basic taxonomy and terminology of computer networking area
3) To provide adequate knowledge and understanding about Internet, Web browsers, search engines
4) To give an introduction of E-commerce Technology, Business models and Electronic payment System.

PGDCA-203 Object Oriented Programming Using C++

C++ is an Object Oriented Programming language. It is fast, portable and available in all platforms. This course will help the students to:

1) Understand the basic concepts of object Oriented Programming
2) Develop the programs using Classes and Objects
3) Understand the concept of reusability using Inheritance
4) Learn how to implement Polymorphism using Operator Overloading and Function Overloading.

PGDCA-206 E2 Workshop on Adobe Photoshop

1) Understand the basics of adobe Photoshop.
2) Able to use o various selection tools.
3) Able to work with layers, channels and filters of adobe Photoshop.
4) Able to create images for Web.

Master of Computer Applications (MCA)

Programme outcomes:

1) Apply computing fundamentals and domain knowledge for problem-solving.
2) Analyze and solve complex computing problems using mathematical principles.
3) Design and evaluate solutions, considering safety and societal factors.
4) Conduct research-based investigations for valid conclusions.

Programme specific outcome:

1) Effectively use modern computing tools, understanding their limitations.

2) Adhere to professional ethics and cyber regulations.
3) Recognize the importance of continuous learning for professional development.
4) Apply computing and management principles in project leadership.
5) Communicate complex computing concepts effectively.
6) Understand and address societal, environmental, and legal implications.
7) Work proficiently both individually and in diverse teams.
8) Identify and pursue innovative opportunities for individual and societal benefit.

Course Outcomes:

MCA-111: Mathematical Foundation of Computer Science

After completing this course, the student must demonstrate the knowledge and ability to:

CO1: Apply logic expressions for a variety of applications.

CO2: Understand and be able to use the notions of propositions and predicate formulae and formal proof.

CO3: Utilize the knowledge of computing and mathematics appropriate to the discipline.

CO4: Understand the functions concepts and distinguish different types of functions.

CO5: Identify and describe various types of relations.

MCA-112: Computer Organization and Architecture

After course completion students will able to:

CO1: Understand the concepts of various components to design stable logic circuits.

CO2: Minimize the Boolean expression using Boolean algebra and design it using logic gates.

CO3: Analyse and design combinational circuits.

MCA-113: Data Structures

CO1: The students will be able to select appropriate data structures as applied to specified problem definition.

CO2: Implement operations like searching, insertion, and deletion, traversing mechanism etc.

CO3: Implement appropriate sorting/searching technique for given problem.

MCA – 114: Object Oriented Programming Using C++

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

CO1: Apply object-oriented paradigm for problem solving.

CO2: Select a suitable programming construct and in-built data structure for the given problem.

CO3: Design, develop, document and debug modular programs.

MCA-115: Workshop on Python Programming

CO1: To provide Basic knowledge of Python and to understand why Python is a useful scripting language for developers.

CO2: To learn how to design and program Python applications.

MCA-121 Database System

CO1: Students will be able to explain the features of database management systems and relational database.

CO2: Design conceptual models of a database using different modelling approaches.

MCA-122 Programming in Java

CO1: Students will be able to implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.

CO2: Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to particular problem.

CO3: Demonstrates how to achieve reusability using inheritance, interfaces & packages and faster application development.

MCA-123: Operating System

After Completion of the course the students will be able to:

CO1: Describe the role of operating system in the management of various computer resources.

CO2: Understand the process management policies and scheduling of processes by CPU.

CO3: Evaluate the requirement for process synchronization and coordination handled by operating system.

CO4: Describe and analyze the memory management and its allocation policies.

CO5: Identify use and evaluate the storage management policies with respect to different storage management technologies.

MCA-124 Data Communication and Networking

CO1: Understand the concept of reliable and unreliable transfer protocol of data and how TCP

and UDP implement these concepts, to understand the client/server model and socket API with their implications.

CO2: Acquire skills to implement a network protocol based on socket programming.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF PHYSICS

SESSION: 2023-24

Post Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program: Masters of Science Physics

PROGRAMME CODE: MSC-PH

Duration: 2 Years

Master of Science (M.Sc.) in Physics programme is designed to prepare students for a research career in academia or industry by introducing advanced ideas and techniques that are applicable in a wide range of research areas while emphasizing the underlying concepts of Physics. This course provides in-depth understanding of principles and concept of Physics, proficiency in experimentation to understand the theoretical and experimental dimensions of Physics.

Programme Educational Objectives

- The post graduates will have knowledge of fundamental laws and principles in a variety of areas of Physics along with their applications.
- The post graduates will develop research skills which might include advanced laboratory techniques, numerical techniques, computer algebra, computer interfacing.
- The post graduates will become effective researcher who will be able to provide lucid summation of the scientific literature on a given topic of study.
- The post graduates will develop the skill to plan, execute and report the results of an extended experimental or theoretical Physics based project in a research environment.

Programme Outcomes

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

- Apply theoretical knowledge of principles and concepts of Physics to practical problems.
- Use mathematical techniques and interpret mathematical models of physical behavior.

- Demonstrate the ability to plan, undertake, and report on a programme of original work; including the planning and execution of experiments, the analysis and interpretation of experimental results.
- Assess the errors involved in an experimental work and make recommendations based on the results in an effective manner.
- Develop communication skills, both written and oral, for specialized and non-specialized audiences.

SCHEME OF STUDIES

M.SC. PHYSICS PART-I

Program Code: MSC-PH SEMESTER-I

Paper Code	Paper Title	Credits	Hours Per Week	Marks		
				External	Internal	Total
Core Papers						
PH-1.1.1	Mathematical Methods of Physics– I	4	4	70	30	100
PH-1.1.2	Classical Mechanics	4	4	70	30	100
PH-1.1.3	Classical Electrodynamics	4	4	70	30	100
PH-1.1.4	Quantum Mechanics	4	4	70	30	100
Elective Papers* (Any One)						
PH-1.1.5*	(i) Electronics-I	4	4	70	30	100
	(ii) Remote Sensing	4	4	70	30	100
	(iii) Microwave and its Propagation	4	4	70	30	100
Laboratory Practice						
PH-1.1.6	Group I: Electronics Lab Group II: Laser and Optics Lab	6	12	70	30	100
	Total	**26**	**32**			**600**

*Each student has to choose any one elective paper. Options will be offered depending upon the availability of teaching staff.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

SEMESTER II

Paper Code	Paper Title	Credits	Hours per Week	Marks		
				External	Internal	Total
Core Papers						
PH-1.2.1	Mathematical Methods of Physics– II	4	4	70	30	100
PH-1.2.2	Advanced Classical Mechanics and Electrodynamics	4	4	70	30	100
PH-1.2.3	Advanced Quantum Mechanics	4	4	70	30	100
PH-1.2.4	Statistical Mechanics	4	4	70	30	100
Elective Papers (Any One)**						
PH-1.2.5**	(iv) Electronics-II	4	4	70	30	100
	(v) Physics of Electronic Devices and Fabrication of Integrated Circuits and Systems	4	4	70	30	100
	(vi) Science and Technology of Solar Hydrogen and Other Renewable Energies	4	4	70	30	100
Laboratory Practice						
PH-1.2.6	Group I: Laser and Optics Lab Group II: Electronics Lab	6	12	70	30	100
	Total	**26**	**32**			**600**

**Each student has to choose any one elective paper. Options will be offered depending upon the availability of teaching staff.

Semester – I

PH-1.1.1: MATHEMATICAL METHODS OF PHYSICS - I

Course Objective: The course will cover some mathematical techniques commonly used in physics. The focus of the course is not on pure mathematics, but rather on the application of mathematics to problems of interest in the physical sciences.

Course learning outcome: On successful completion of this course, students will be able to:

- Understand the concept and uses of Beta and Gamma function.
- Understand the concept of special functions like Legender's function and Bessel Function and their applications in physical problems.
- Understand the concept of Tensors and Einstein's notations.
- Applications of various numerical methods and applications in Physics.

PH-1.1.2: CLASSICAL MECHANICS

Course Objective: The purpose of the course is to train the students in the Newtonian Mechanics. Lagrangian and Hamiltonion formalisms to an extent that they can use these in the modern branches of Physics.

Course learning outcome: On successful completion of this course, students will be able to:

- Understand the concept of virtual work and displacement and D' Albert Principle.
- Understand the concept of Lagrange's equations of motion.
- Understand the Hamiltonian equations of motion.
- Acknowledge the concept of Poisson brackets and Canonical transformations.

PH-1.1.3: CLASSICAL ELECTRODYNAMICS

Course Objectives: To apprise the students regarding the concepts of electrodynamics and Maxwell equations and use them various situations.

Course learning outcomes: Students will have achieved the ability to:

- Explain Coulomb's Law, Electric Field, Gauss's Law and its applications
- Explain Boundary Values Problems, Bound Charges and Bound Charge Densities.
- Use Maxwell equations in analyzing the electromagnetic field due to time varying charge and current distribution.
- Describe the nature of electromagnetic wave and its propagation through different media and interfaces.
- Explain charged particle dynamics and radiation from localized time

varying electromagnetic sources.

PH-1.1.4: QUANTUM MECHANICS

Course Objective:

- To study the basic principles of quantum mechanics.
- Explain the operator formulation of quantum mechanics.
- Student will learn the concept of wave function.
- Student will learn Schrodinger equation and their applications.
- To study role of uncertainty in quantum Physics.

Course Learning Outcomes: After the completion of the course, students will be able to:

- Understand and explain differences between classical and quantum mechanics.
- Understand the idea of wave function.
- Understand the uncertainty relations.
- Solve Schrodinger equation for simple potentials.
- Describe Dynamics of systems that move under influence of spherically symmetric potential

PH-1.1.5: ELECTRONICS-I

Course Objectives: The course has been designed:

- To introduce fundamental principles of analog and digital electronics and distinguish between analog and digital systems.
- To learn and understand the basics of digital electronics, Boolean algebra, and able to design the simple logic circuits.

Semester – II

PH-1.2.1: MATHEMATICAL METHODS OF PHYSICS – II

Course Objective: The course will cover some mathematical techniques commonly used in physics. The focus of the course is not on pure mathematics, but rather on the application of mathematics to problems of interest in the physical sciences.

Course learning outcome: On successful completion of this course, students will be able to:

- Understand the concept and uses of Laplace Transform.

- Understand the concept of special functions like Hermite function and Laguerre Function and their applications in physical problems.
- Understand the concept of Fourier series and transform.
- Applications of partial differential equations and Group theory in Physics.

PH-1.2.2: ADVANCED CLASSICAL MECHANICS & ELECTRODYNAMICS

Course Objective: The purpose of the course is to train the students in the Hamilton- Jacobi and Special Theory of Relativity formalisms to an extent that they can use these in the modern branches of Physics. **Course learning outcome:** On successful completion of this course, students will be able to:

- Solve Hamilton-Jacobi equations.
- Solve Lagrange's equations of motion for small oscillations.
- Understand the concept of Special Theory of Relativity and various Four vectors, concept of four-force and four-momentum etc.
- Explain the Covariant form of Maxwell's field Equations in term of Electromagnetic Field Tensor.

PH-1.2.3: ADVANCED QUANTUM MECHANICS

Course Objectives: To give exposure about the various tools employed to analyse the quantum mechanical problems

Course Outcomes:

- Students will be able to apply the mathematical theories of quantum mechanics to real problems in Particle Physics and Classical Physics.
- This course introduces the method of applying rules of quantum mechanics to understand the quantum properties of particles, radiations, atoms and their interaction.
- Also this course introduces Application of approximation methods and scattering theories.

PH-1.2.4: STATISTICAL MECHANICS

Course Objective: To understand the properties of macroscopic systems using the knowledge of the properties of individual particles.

Course Outcomes: On completion of this course, students will be able to:

- Identify and describe the statistical nature of concepts and laws in thermodynamics.
- Use the statistical physics methods such as Boltzmann distribution, Gibbs distribution,
- Fermi-Dirac and Bose-Einstein distribution. Body radiation to analyze radiation phenomenon.
- Apply the concepts and laws of thermodynamics to solve problems such as gases, heat engines

PH-1.2.5: ELECTRONICS– II

Course Objective: The purpose of the course is to expose the students to the Power amplifiers, Tuned amplifiers, OPAMP and OPAMP based analog circuits and communication techniques.

Course learning outcome: On successful completion of this course, students will be familiar with the various Power amplifiers, Tuned amplifiers, OPAMP and OPAMP based analog circuits and communication techniques.

PG Department of Chemistry
Session: 2023-2024
Post Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Programme Name: M. Sc. Chemistry

M. Sc. Chemistry

Program Outcomes (PO)

After completing M.Sc. Chemistry programme, students will be able to:

1. Communicate scientific information in a clear and concise manner both orally and practically.
2. Design experiments, analyze, synthesize and interpret data to provide solutions to different industrial problems by working in the pure, inter and multi-disciplinary areas of chemical sciences.
3. Enhance the scientific temper among the students to develop a research culture and implementation of the policies to tackle the burning issues at global and local level.
4. Augment the recent developments in the field of green and eco-friendly reactions, pharmaceutical, Bioinorganic Chemistry and relevant fields of research and development.
5. Create awareness and sense of responsibilities towards environment and apply knowledge to solve the issues related to Environmental pollution.

Programme Specific Outcome (PSO)

1. Exhibit and apply the fundamental knowledge of the basic principles in various fields of Chemistry
2. Apply knowledge to build up small scale industry for developing endogenous product.
3. Apply various aspects of chemistry in natural products isolations, pharmaceuticals, textiles, polymers, petroleum products, forensic etc. and also to develop interdisciplinary approach of the subject.
4. Collaborate effectively on team-oriented projects in the field of Chemistry or other related fields.
5. Inculcate logical thinking to address a problem and become result oriented with a positive attitude.
6. Explain environmental pollution issues and the remedies thereof.
7. Apply the knowledge to develop the sustainable and eco-friendly technology in Industrial Chemistry
8. Have developed their critical reasoning, judgment and communication skills.
9. Augment the recent developments in the field of green and eco-friendly reactions, pharmaceutical, Bioinorganic Chemistry and relevant fields of research anddevelopment.

Course Outcomes

PAPER MC 101: INORGANIC CHEMISTRY -I	1. To enable students to gain the basic knowledge of Bio-inorganic chemistry. 2. To equip students with the knowledge of Transition Metal Bond Theories. 3. To give basic information of Orgel/Tunabe-Sugano Diagrams.

PAPER MC 102: ORGANIC CHEMISTRY-I	1. To enable students to develop a comprehensive knowledge of various types of reactions, mechanisms and intermediate species involved in organic reactions. 2. To render students capable of understanding and deducing products and mechanism of unknownreactions. 3. To develop the basic knowledge of the rich chemistry and properties of Aromatic/Anti Aromatic/Non Aromatic compounds and their interactions with various 4. species through non-bonding interactions.
PAPER MC 103: PHYSICAL CHEMISTRY- I	1. To acquaint the students about the basic concepts involved in first and Second law of thermodynamics and to calculate the change in Entropy and free energy. 2. To provide an insight about activity, fugacity and partial molal properties and their determination by using various methods. 3. Students will be able to demonstrate and realize the importance of chemistry in living systems, such as students will study coupled reactions and metabolism, free energy utilization in metabolismetc. 4. The subject will provide the students the basic knowledge of statistical thermodynamics, partition function and expressions of thermodynamic properties in terms of partition function. 5. The subject will impart fundamental knowledge about the basic concepts of Electrochemistry such as Born model of ion-solvent interactions, Debye- HuckelOnsagar theory, Electrical double layer theory, etc. 6. The students will learn about Electrochemical systems of energy production, Electrochemical processes of surface treatment and also about corrosion and its protection methods.
PAPER MC 104A: MATHEMATICS FOR CHEMIST	1. The students will be taught about various types differentiation and integration methods to be used in Chemistry to solve various theoretical derivations.
PAPER MC 104B: BIOLOGY FOR CHEMIST	1. The students will be taught about the origin of life and different types of cells and their organelles in different living organisms. 2. The course will provide the indepth knowledge of important biomolecules of life *viz.* carbohydrates, proteins, lipids, nucleic acids (DNA/RNA) and enzymes. 3. To deliver the basic knowledge of various metabolic pathways involved in energy generation.

PAPER MC 105: INORGANIC CHEMISTRY LAB	1. The students will be able to learn the preparation methods of coordination complexes. 2. They will be able to record the UV-Vis and IR spectra of synthesized complexes 3. They will be able to estimate the metal and ligandpresent in the prepared complex.
PAPER MC 106: ANALYTICAL CHEMISTRY LAB	1. The course will enable the students to demonstrate the complex metric titrations of various samples 2. They will be able to determine the calcium & magnesium content in different samples. 3. To develop skills in conductometric, potentiometric, pH-metric and colorimetric titration, which will have many applications in various industries.
PAPER MC 201: INORGANIC CHEMISTRY -II	1. To acquaint the students basic understanding of the chemistry of Main Group elements with special emphasis on bonding and structure. 2. Students will get an insight into Cluster compounds, their importance and applications. 3. To provide basic idea of applying symmetry elements, symmetry operations and find point groups of molecules. 4. Students will learn how the various physical aspects can be derived from symmetry. 5. To provide an insight into the applications of group theory as in various spectroscopic techniques like IR, Raman Spectroscopy.
PAPER MC 202: ORGANIC CHEMISTRY-II	1. To introduce students with various terms and concepts included in Organic Stereochemistry. 2. To enable students to solve stereochemistry related problem through practice. 3. To equip students with the basic knowledge of pericyclic reactions and the various approaches involved for deducing the mode of pericyclic reactions.
PAPER MC 203: PHYSICAL CHEMISTRY- II	1. In this course on physical chemistry, students will be introduced to fundamental principles and modern aspects of Quantum and kinetics chemistry. 2. Students will study basic postulates of quantum mechanics, setting up of operators for different observables. Students will also get and insight about to solve the simple quantum mechanical models, such as particles in 1D, 3D, Harmonic oscillator, rigid rotor,Hydrogen atom, etc. 3. To equip students to understand the approximation methods: Variation and perturbation and their applications for Helium atom. 4. The subject will also provide an insight about Huckel

	ethylene, butadiene, cyclopropenyl radical and cyclobutadiene system. 5. Students will be able to explain the theoretical basis of quantum chemistry, and critically examine/interpret the theories/principles, compare various approximate formalisms and their validity in explaining experimental phenomena 6. To have an idea about Rate of reaction, order and molecularity of reaction and to learn the different theories of rate of reaction and factors affecting reaction rates. 7. Students will understand thoroughly the concept of different type of catalysis, Michaelis-Menten mechanism for enzyme catalysis and various type of complex reactions.
PAPER MC 204: COMPUTER FOR CHEMIST (THEORY & PRACTICAL)	1. To develop a basic knowledge of Computer (C++ language) to Chemistry Students through theory and practicals.
PAPER MC 205: ORGANIC CHEMISTRY LAB	1. The student will be able to learn importance of reaction conditions for a particular reaction and their mechanism. 2. The student will be able to learn regarding set up the apparatus for the purification, isolation, synthesis and 3. characterization of certain compounds
PAPER MC 206: PHYSICAL CHEMISTRY LAB	1. Demonstrate knowledge of visometer and stalgamometerto find the viscosity and surface tension of various liquids. They will also learn to find densities of various liquids using Pykometer. 2. Students will learn to find the refractivity of various alcohols and other liquids.
PAPER MC 301: ANALYTICAL CHEMISTRY	1. The students will be able to explain the fundamentals of analytical chemistry, steps of a characteristic analysis, express the role of analytical chemistry in science, Compare qualitative and quantitative analysis. 2. The students will be able to estimate kinds of errors and their sources in chemical analysis. Evaluate the effects of systematic errors on analytical results. Compare of the experimental mean with a true value and two experimental means. 3. The student will be able to explain the theoretical principles of instrumental techniques of electroanalytical, spectrometric/spectrophotometric, thermo analytical and main components in such analytical instruments. 4. The student will be able to explain the theoretical principles of various separation techniques such as solvent extraction, ion exchange chromatography, and their applications in analytical chemistry.

PROJECT WORK MC 302:	1. To Increase research temperament in students
PAPER MC 311 LIGAND FIELD THEORY	1. This course will enable the students to learn bonding, orbital arrangement, and other characteristics of coordination complexes. 2. Students will be able to find out term symbols & total possible arrangements in any electronic configurations. 3. This Enable the students to know about how orbital of metal is affected by ligand & how the electron present in metal ions effected by nature of ligand.
PAPER MC 312: REACTION MECHANISM OF TRANSITION METAL COMPLEXES	1. To learn about ligand replacement reaction by using the knowledge of labile and inert complexes and substitution reaction of octahedral and square planar complexes and other different reactions. 2. To learn about reaction of square complexes with the help of ligand displacement reactions. 3. To learn about metal carbonyl reactions of octahedral with the help of dissociative and associative substitution mechanism reactions. 4. To learn about different Electron transfer processes through outer sphere and inner sphere mechanism, Two electron transfer reactions and replacement through redox mechanism. 5. To learn about oxidative addition and migration reactions by using acid base behaviors of metal atom in complexes, oxidative addition reaction, reductive elimination and by insertion reaction. 6. To learn about stability constants of metal complexes by using different methods like slope ratio method solubility method and Ion exchange method etc.
PAPER MC 313: INORGANIC SPECTROSCOPY –I	1. The students will get a deep insight into the various spectroscopic methods used for the characterization of various compounds. 2. To study molecular interactions by choosing suitable spectroscopic methods & interpreting corresponding data. 3. To study the origin, instrumentation & important applications of IR, Raman, Mossbauer techniques. 4. The students will be able to analyze the NQR data for chemical analysis. 5. They will be able to explain the principle, instrumentation & application of Mossbauer Spectroscopy to study bonding in Iron derived complexes.
PAPER MC 314: INORGANIC CHEMISTRY PRACTICALS –I	1. The students will be able to synthesize the different inorganic complexes and also find their purity. 2. To be able to estimate the metal and ligand present in the prepared complexes and also learn about their bonding. 3. They will be able to know about preparation of exact solutions for quantitative analysis.

PAPER MC 315: INORGANIC CHEMISTRY PRACTICALS –II	1. The students will be able toperform Ion-exchange chromatography for separation of ions and study about their Rf values. 2. To understand the Spectrophotometric determinations of Fe (II), Fe (III), Ni (II) and Cu (II) with their suitable ligands. 3. Students will be able to handle instruments like conductometer, spectrophotometer etc.
PAPER MC 321: PHOTOCHEMISTRY AND PERICYCLIC REACTIONS	1. To provide students a detailed knowledge about various types of transitions, their selection rules, molecular orbital views in organic compounds. 2. To apply the frontier and perturbation molecular orbital theories to various pericyclic reactions. 3. To give the comprehensive knowledge of the photochemical reactions of functional group including olefins, dienes, carbonyls, enones, isolated dienes, conjugated dienes and aromatic compounds.
PAPER MC 322: CHEMISTRY OF NATURAL PRODUCTS	1. The students will get a deep insight into chemistry of secondary metabolites like Alkaloids, Steroids, Terpenoids. 2. Students will learn general methods and techniques of structure elucidation of complex natural compounds. 3. Get to know the alternative sources of natural compounds, which can finally lead to more useful and potent drug. Yet another area of acquaintance concerns the way in which compounds are synthesized biologically.
PAPER MC 323: HETEROCYCLIC CHEMISTRY	1. The students will learn naming heterocycles using various methods of nomenclature. 2. The students will learn the properties and synthesis of various heterocyclic rings (three, four, five and six) The students will be made familiar reactions involving molecular rearrangements.
PAPER MC 324: ORGANIC CHEMISTRY PRACTICALS –I	1. To enable students with the potential to understand and carryout the various techniques to synthesize, purify and characterize Organic Compounds. 2. To equip students with the confidence to design and synthesize given organic compounds through multistep synthesis methodology.
PAPER MC 325: ORGANIC CHEMISTRY PRACTICALS –II	1. To develop basic knowledge and carry out various types of titrimetric analysis of organic compounds for their purity, including estimation of carbohydrates, amines, phenols, preserving agents such as salycilates and benzoates.
PAPER MC 331: FUNDAMENTALS OF SPECTROSCOPY	2. To gain advanced knowledge about the interactions of electromagnetic radiation and matter and their applications in spectroscopy. Be able to apply formalisms based on molecular symmetry to predict spectroscopic properties. 3. Be able to analyze and interpret spectroscopic data

	collected by the methods discussed in the course. Be able to solve problems related to the structure, purity and concentration of chemicals and to study molecular interactions by choosing suitable spectroscopic methods and interpreting corresponding data. 4. To know the basics principle of different techniques employed in molecular spectroscopy. To study the origin, instrumentation and important applications of Microwave, IR, Raman, UV, NMR, NQR, ESR and EQR techniques.
PAPER MC 332: STATISTICAL THERMODYNAMICS	1. Explain statistical physics and thermodynamics as logical consequences of the postulates of statistical mechanics; 2. Apply the principles of statistical mechanics to selected problems. 3. Apply techniques from statistical mechanics to a range of situations. 4. Use the tools, methodologies, language and conventions
PAPER MC 333: FUNDAMENTAL AND ATMOSPHERIC PHOTOCHEMISTRY	1. To acquire knowledge of photochemistry, like the basic laws of photochemistry; Grothus & Draper law, law of photochemical equivalence and law of absorption (Lambert Beer's law). 2. To describe and explain photochemical and photophysical processes using Jablonski diagram and their quantum yield expressions. 3. To study the selection rules for electronic transitions and develop quantum mechanical formulation of Franck-Condon principle. 4. Apply knowledge to analyze and develop photoactive systems and the reactivity of excited states to explain applications in photochemical energy conversions. 5. Understand the working principle and use of the simplest photochemical techniques and apply the knowledge in industries, such as for optical bleaching of textiles and papers, for electron and energy transfer processes and in photochemical synthesis of detergent and insecticides. 6. Demonstrate knowledge about structure of atmosphere in terms of temperature, composition, diffusion and ionization and thereby acquire knowledge about chemistry of upper atmosphere. 7. Recognize different types of toxic substances in the environment and apply the basic chemical concept to analyze chemical processes involved in different 8. environmental problems and to learn control methods.
PAPER MC 334: PHYSICAL CHEMISTRY PRACTICALS –I	1. Demonstrate knowledge of spectrophotometer and polarimeter practical.

PAPER MC 335: PHYSICAL CHEMISTRY PRACTICALS –II	1. Demonstrate knowledge of kinetics, phase rule and thin layer chromatography practicals.
PAPER MC 401: ENVIRONMENTAL CHEMISTRY	1. The students will acquire the knowledge regarding 2. Different concepts of atmosphere, stratospheric and tropospheric chemistry, photochemical smog, acid rain, global warming. 3. Different types of environmental pollution (air, water and soil pollution), various reactions involved, and different monitoring techniques used to analyzing the pollutants. 4. Principle and working of instrumental techniques (IR, AAS, FES, Chromatographic techniques etc)
PROJECT WORK MC 402:	1. To Increase research temperament in students
PAPER MC 411: CHEMISTRY OF ORGANOMETALLIC COMPOUNDS	1. To know and understand the different properties and structures for organometallic compounds from different parts of the periodic table and their trends. 2. To know principal synthetic routes to various classes of organometallic compounds. 3. Organometallic compounds are very important in biological bodies like haemoglobin, chlorophylls, Vitamin B12 and also they can be used as chemicalreagent. This course give knowledge about the synthesis and properties of these organometallics Describe bonding models that can be applied to a consideration of the properties of transition metal organometallic species with a wide range of ligands.
PAPER MC 412: ADVANCED TOPICSIN INORGANIC CHEMISTRY	1. They will be able to understands various aspects of radioactivity & applications of radioactive elements in exchange reactions. 2. Learn about the background on Nanoscience Understand the synthesis of nanomaterials and their application and the impact of nanomaterials on environment. Apply their learned knowledge to develop Nanomaterials
PAPER MC 413: INORGANIC SPECTROSCOPY-II	1. The students will study the detailed concepts of HNMR spectroscopy, Mass spectroscopy, ESR Spectroscopy. 2. Enable the students to interpret the structure of compounds by analyzing the spectral data. 3. The students will get a deep insight into the concept ofORD and CD 4. To impart the student's thorough idea of applications of NMR. 5. They will learn to determine stochiometry of Metal Ligand complexes by Job's method. Have achieved advanced knowledge about the of NMR Spectra of Transition metal

	ion complexes.
PAPER MC 414: INORGANIC CHEMISTRY PRACTICAL- I	1. To provide experimental skills to students onto preparation of coordination compounds and estimating the amount of metal and ligands in these compounds. 2. Apply the knowledge of quantitative analysis for the determination of metals form water and alloys. They will be able to understand the stereochemistry of synthesized compounds.
PAPER MC 415: INORGANIC CHEMISTRY PRACTICAL- II	1. The lab course will enhance the skill of stoichiometric determination of various complexes by Job's and Mole-Ratio method. 2. To study the oscillator strength and assignments of d-d bands to transitions in the UV-Vis spectra of transition metals. 3. They will be able to verify the relative positions of various ligand in spectrochemical series and also learn to practically calculate 10 Dq and beta values for hexa aqua ion of Ni (II). 4. Students will Learn to handle IR spectrometer and howto get IR spectra of various inorganic complexes.
PAPER MC 421: APPLICATIONS OF ORGANIC MOLECULAR SPECTROSCOPY	1. The students will get a deep insight into the various spectroscopic methods used for the characterization of organic compounds. 2. They will be able to elucidate the structure of compounds by analysing the spectral Data. 3. The students will study the concepts of 1H NMR, 13 C NMR Spectroscopy and 2D NMR techniques. 4. They will know UV, IR techniques. 5. They will study mass spectrometry: Instrumentation, various methods of ionization. Different detectors rules of fragmentations of different functional groups.
PAPER MC 422: ORGANIC SYNTHESIS	1. To introduce students with the various organic reagent used in Organic Synthesis. 2. To euip students to deduce a valid synthesis of any Organic Molecule using various concepts ofDisconnection Approach. 3. To render students efficient enough to solve all Organic reactions related problems through practice.
PAPER MC 423: MODERN SYNTHETIC REACTIONS &REARRANGEMENTS	1. The students will be taught the various types of rearrangement reactions and their mechanisms. 2. To give a basic knowledge of various named reactions and their mechanism.

PAPER MC 424: ORGANIC CHEMISTRY PRACTICALS –I	1. To give the basic idea and methodology of protection, deprotection, ring enlargement, cyclization, reduction, oxidation using multistep synthesis of organic compounds with varied functionality.
PAPER MC 425: ORGANIC CHEMISTRY PRACTICALS –II	1. To aware the students about spectrophotometric analysis of carbohydrates, asprin, caffeine, amino acids, and ascorbic acids. 2. To equip students with the efficiency to handle separation of bioorganic compounds through paper chromatography.
PAPER MC 431: X-RAY DIFFRACTION & OTHER TECHHNIQUES	1. To get an overview about the structure and properties of solid crystals and liquid crystals. To know the characterization of crystals using X-Ray diffraction. To learn the important aspects of gaseous state and electrochemistry. 2. To study the principle, instrumentation and applications of diffraction method. 3. To understand, band model theory for metals Intrinsic and impurity semiconductor. To understand laser maser and their types. Be able to apply formalisms based on molecular symmetry to predict spectroscopic properties. 4. Be able to analyze and interpret spectroscopic data collected by the methods discussed in the course. Be able to solve problems related to the structure, purity and concentration of chemicals and to study molecular interactions by choosing suitable spectroscopic methods. 5. To impart a thorough knowledge of the CD AND ORD.To study the origin, instrumentation and important applications of mass spectrometry, Photoelectric effect, Mossbauer spectroscopy, Flame photometry, Refractometry, CD and ORD. 6. To impart the students concepts of the fundamentals of spectroscopy and its applications in the study of structure of atoms, bonding in molecules and molecular spectroscopy.
PAPER MC 432: BIO-PHYSICAL CHEMISTRY & ADVANCED SPECTROSCOPY	1. To study the origin, instrumentation and important applications of mass spectrometry, AES, PES, AES 2. To understand, band model theory for metals Intrinsic and impurity semiconductor. To understand laser maser and their types.
PAPER MC 433: POLYMER & SURFACE CHEMISTRY	1. To acquire knowledge about essential descriptions about polymer chemistry, such as Classification and nomenclature of polymers, their composition and polymerization mechanism. 2. Elaborate on step-growth and chain polymerization, with respect to their mechanism and kinetics. 3. Estimate the number- and weight-average molecular masses of polymer samples given the degree of polymerization and mass fraction of chains present. 4. Demonstrate the knowledge about molecular weight determination by osmotic method, light scattering method

	sedimentation method, diffusion constant, sedimentation equilibrium, viscosity method. 5. To understand the knowledge of adsorption process and influence of temperature and pressure on adsorption process. 6. Describe the assumptions and derivations of various adsorption isotherms and explain how the specific adsorption isotherm could be used for the surface area determination of different materials. 7. To learn about catalysis and compare & contrast homogeneous and heterogeneous catalysis. 8. To get an overview about spectroscopic methods like PES, AES, LEED for the determination of surface structure and also study the important applications of surface chemistry and various concepts like, surfactant, 9. wetting, micelles, detergency, surface tension, interfacial tension.
PAPER 434: INSTRUMENTAL PHYSICAL CHEMISTRY PRACTICALS-II	1. Demonstrate the practical of conductance, pH meter, potentiometer.
PAPER 435: PHYSICAL CHEMISTRY PRACTICALS-II	1. Demonstrate the practical of spectroscopy, CMC.

PG Department of Mathematics

SESSION -2023-2024

POST GRADUATE PROGRAMME

Programme outcomes (POs), Progmamme Specific outcomes (PSO s) and Course outcomes (CO s) of the Programmes.

PROGRAMME NAME: M.Sc. mathematics

Program outcome:

Program outcome:

On completion of course students will be able:

1. To develop skills required for sound analytical and practical knowledge to pursue Careers in research, education and industry.
2. To train computational scientists who can work for real life challenging problems.
3. To develop their understanding and professional capabilities through lifelong Learning.
4. To develop an ability to communicate effectively with a range of audiences.
5. To inculcate recognition of the need for and an ability to engage in continuing Professional development

Part 1(Sem1-Sem2)

Program specific outcome: After completion these semester of course students will be able:

1. To develop an ability to communicate effectively with a range of audiences.
2. To understand pure branch of mathematics.

Courses outcomes:

MM-401: ALGEBRA– I: Upon completion of the course, students will be able to

1. Demonstrate understanding of Group, permutation group.
2. Acquire the notion of permutations and operations on them.
3. Prove Cayley's theorem, Sylow's theorem and its application.
4. Understand polynomial Rings, Matrix Rings, Ideals, Field of quotients of integral Domain

MM-402: REAL ANALYSIS-I: Upon completion of the course, students will be able to

1. Explain Fundamental concepts like countable and uncountable sets, Metric spaces
2. Understand compactness, sequence, subsequence convergent sequences in Metric space.
3. Understand Continuity, discontinuity and connectedness in Metric spaces.
4. Acquire the idea of Riemann Steilje's integral and prove associated theorems

MM-403: TOPOLOGY I:

1. The objective of the course is to introduce the concept of topological paces, their various properties and other separation axioms

MM-404: DIFFERENTIAL GEOMETRY:

1. To acquaint students with the idea of parameterization, curvature and Torsion of space curves.
2. To familiarise the students with concepts like surface patches, fundamental forms and normal Curvature.
3. To teach students about Gaussian curvature and proof of Gauss Remarkable theorem

MM-405: COMPLEX ANALYSIS:

1. This course will provide an introduction to the theories for functions of complex variable.
2. It begins with the exploration of the algebraic, geometric and topological structures of the complex number field.
3. The concepts of analyticity, Cauchy Riemann relations and harmonic functions are introduced.
4. Students will be equipped with the understanding of the fundamental concepts of complex variable theory.

MM-501: ALGEBRA-II:

1. Familiarize students with the concepts of UFD, PID, ED.
2. Acquaint students with modules, submodules, free modules and modules with chain Conditions.
3. Enable students to differentiate between modules and vector spaces.
4. Explain Rational canonical form and Jordan Canonical form

MM-502: REAL ANALYSIS-II: Students will be able to

1. Define and understand differentiation of vector valued functions of several variables.
2. Understand Inverse function theorem and Implicit function theorem.
3. Describe and apply the notion of measurable functions and sets.
4. Use Lebesgue monotone and dominated convergence theorems and Fatou's lemma.
5. Describe and apply Lebesgue integral.
6. Explain the concepts of Functions of bounded variations, Absolute continuity and convex Functions.

MM-503: DIFFERENTIAL EQUATIONS:

1. Enable students to understand various analytical methods to find exact solution of ordinary differential equations and their implementation to solve real life problems.

TOPOLOGY II:

1. To acquaint students with the concepts of order types of sets.
2. To teach students the higher separation axioms and related fundamental results.
3. To equip students with knowledge of filters and identification topology.
4. To introduce Categorical Language in Topology with the study of Elementary Homotopy

MM-505: MATHEMATICAL METHODS: Students will be able to

1. Identify Linear integral equations and Volterra's equation, Non linear and singular equations.
2. Solve Volterra's and Fredholm equations.
3. Be familiar with Hadamard's theorem, Riesz Fischer theorem and Schwarz's theorem.
4. Understand Green's function and its application to integral equations.
5. Acquire the knowledge of variational methods

Part-2 (sem3-sem4)

Program specific outcome: After completion these two semester students will be able:

(1) To develop skills required for sound analytical and practical knowledge to pursue Careers in research, education and industry.

(2) To develop their understanding and professional capabilities through lifelong Learning.

Courses outcomes:

MM-601: Functional Analysis: This Course will enable the students:

1. To learn recognize the fundamental properties of normed linear spaces.
2. To understand the concepts of Banach spaces, Inner product and Hilbert spaces and to learn to classify the examples.
3. To study the main properties of bounded linear transformations over Banach and Hilbert spaces.
4. To be acquainted with the statements and proofs of Hahn-Banach theorem, Open mapping, Closed graph, Uniform boundedness, Riesz representation theorem, spectral and Banach fixed point theorems.
5. Identify complete orthonormal sets, orthogonal complement, adjoint, self-adjoint, normal and unitary, projection operators.

MM-602: DIFFERENTIABLE MANIFOLDS:

1. To equip students with the idea of manifolds and tensors.
2. To acquaint the students with concepts of torsion and curvature in higher dimensions.
3. To teach students fundamentals of Riemannian geometry and give idea about concept of sectional curvature of a manifold

MM-604: NUMERICAL ANALYSIS:

1. Introduce various iterative methods available to solve differential equations.
2. The course will also help the students to develop knowledge of C.

MM-605: FIELD THEORY:

1. This course will introduce the basic ideas of field theory, leading to the Galois Theory and its applications in solving some of the classical problems.

MM-606: OPTIMIZATION TECHNIQUES-I:

1. Introduce the concept of operation research along with models and general methods of solving thee models.
2. Familiarize students with Linear programming problem and different methods of solving these problems.
3. Enable students to acquire the knowledge of Transportation and Assignment problems.

4. Make student understand various methods of solving Transportation and assignment problems.
5. Make students familiar with various methods and theories of games

MM-701: GEOMETRY OF DIFFERENTIABLE MANIFOLDS:

1. To introduce to the students the theory of topological groups, Lie groups and fibre bundles.
2. To teach students the concepts of Riemannian submanifolds.
3. To equip students with the knowledge of complex geometry

MM-702: THEORY OF LINEAR OPERATORS: This Course will enable the students:

1. To learn the spectral properties of normed linear spaces.
2. To understand the difference between eigen and spectral values which help in understanding resolvant and spectrum sets.
3. To study the elementary theory of banach algebra.
4. To study the general and spectral properties of compact linear operators.
5. To understand behaviour of compact linear operators with respect to solvability of operator equations and positive operators.

MM-704: NUMERICAL ANALYSIS- II:

1. The course is being introduced to aware students of various indirect methods available for solving partial differential equations.
2. The student gains knowledge of different schemes to solve differential equations.

MM-706: Non-Linear Programming Problem: This Course will enable the students to:

1. Describe non-linear programming problems.
2. Distinguish non-linear and linear programming problems.
3. A fundamental understanding of non-linear unconstrained and constrained optimization problems.
4. Learn Direct search and Gradient search methods for solving non-linear problems.

MM-707:Optimization Techniques -II :

On Completion of this course, a student should be able to

1. Deep understanding of the theoretical background of queueing systems.
2. To apply and extend queueing models to analyze real world systems.
3. Identify the goals and objectives of Inventory management and describe the importance of Stokes in an organization and the reasons for holding costs and explains the various costs related to inventory system.
4. To find solutions to network flow problems using standard algorithms.
5. Use CPM and PERT techniques,to plan , to schedule and control project activities.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF BOTANY

SESSION: 2023- 2024

Post Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes.

Program: M.Sc. Botany

Programme Outcomes

On completion of program, students will be able to:

1. Design experiments based on the scientific approach.
2. Think critically to formulate hypothesis.
3. Solve problems related to plant sciences.
4. Analyse and interpret results generated through studies in taxonomical observations, field studies, excursion tours and laboratory techniques.
5. Teach at different levels in the academic organizations.
6. Use their skills and knowledge in academics, industry and research.
7. Understand effective communication, and collaborate with other disciplines by effectively knowing the fundamental concepts of Botany.
8. Use their expertise to collaborate Botany with other branches of science.
9. Understand the environmental issues and sustainable development.
10. Work as Entrepreneurs.

Program specific outcomes

On completion of program, students will be able to:

1. Identify different groups of plants on the basis of their morphological, anatomical and genetic characters.
2. Practice safe laboratory procedures, using appropriate protective, biosafety and emergency procedures.
3. Identify the composition of prokaryotic and eukaryotic cells, and their functions.
4. Know the Structure and Chemical composition of macro and micromolecules.
5. Understand the Environmental factors affecting the life cycle of plants.
6. Use different research techniques using different instruments.
7. Understand the Ecological and phytogeographical concepts.
8. Know about various tests used in the statistical analysis.

9. Know about the conservation of biodiversity through *in situ* and *ex situ* practises.
10. Obtain eligibility to get job as Scientist in the Botanical survey of India.
11. Appear for various competitive exams like GATE/CSIR or UGC-NET/JEST/ICMR-JRF/DBT-JRF/DBT-BINC/ICAR-NET.
12. Get job as Taxonomist, Plant breeder, Plant pathologist, Farming consultant, Plant Biochemist, Nursery Manager, Forest ranger, Plant explorer, Environmental consultant, Ecologist, lab technician, Molecular Biologist, Conservationist, Patent Filing expert.
13. Get admission in higher studies i.e., PhD for the welfare of mankind.
14. Appear for Indian Forest Service and other competitive examinations like civil services etc.

Course Outcomes

Semester I

Name of Course: Phycology and Bryology

Paper code: M-BOT-T- 1.1

At the end of the Programme, the students will be able to:

1. Understand the thallus structure, reproduction and economic importance Algae.
2. Understand the characters, distribution, classification and reproduction in Bryophytes.
3. Understand the the characters of different orders of Bryophytes.
4. Know the economic importance of Algae belong to different divisions.
5. Discuss the economic importance of important Bryophytes.

Name of Course: Mycology

Paper code: M-BOT-T- 1.2

At the end of the Programme, the students will be able to:

1. Understand the thallus structure, reproduction and economic importance of fungi.
2. Desscribe the classification, structure of mycelium and reproduction.
3. Understand the hazardous and useful fungi.
4. Know and learn classification and evolutionary trends in fungi.
5. Understand the plant diseases, causal organism and host.
6. Knowledge about the economic importance of important fungi.

Name of Course: Cell and Molecular Biology

Paper code: M-BOT-T- 1.3

At the end of the Programme, the students will be able to:

1. Understand about the various microscopic techniques, and various cell organelles.
2. Acquire knowledge about the cell membrane, plant cell wall.
3. Understand the mechanism of cell division, fine structure of gene and types of DNAs.
4. Acquire knowledge about various micromolecules, their structure and functions.
5. Understand about the regulation of gene expression in prokaryotic and eukaryotic cells.
6. Understand the mechanism of Programmed Cell Death.

Name of Course: Research TechniquesPaper

code: M-BOT-T- 1.4

At the end of the Programme, the students will be able to:

1. Learn about the principles of research techniques, laboratory safety protocols andpreparation of solutions.
2. Understand about the various methods of staining and microscopic techniques.
3. Understand about the electrophoresis.
4. Understand about different techniques of chromatography.
5. Have knowledge about different types of centrifuge machines.

Name of Course: Microbiology

Paper code: M-BOT-T- 1.5

At the end of the Programme, the students will be able to:

1. Understand about microbial groups such as Prokaryotes (Bacteria, Archaebacteria, Cyanobacteria, Mycoplasma, Actinomycetes), Eukaryotes (Molds, Slime molds, Yeast, Algae, Fungi, Protozoa) and Viruses (Bacterial, Plant and Animal).
2. Understand the role of Carbon, Nitrogen, Oxygen, Sulfur and Growth Factors in the Microbial Nutrition.
3. Define the role of microorganisms in pharmaceutical, dairy and food industry, biofuel production and bioremediation.
4. Discuss about the microbes responsible for common human diseases.

Name of Course: Forest Botany

Paper code: M-BOT-T- 1.6

At the end of the Programme, the students will be able to:

1. Explain about the various forest types of India. Role of FRI, NGT and MOEF in Indian Forestry.
2. Explain about the various forest laws**.**
3. Explain about agroforestry, social forestry, farm forestry, productivity forestry and commercial forestry.
4. Discuss upon the silviculture.
5. Understand about the different decay types, symptoms andmanagement of important diseases of timber plants.

Semester II

Name of Course: Pteridophytes and Gymnosperms

Paper code: M-BOT-T- 2.1

At the end of the Programme, the students will be able to:

1. Understand the evolution of stelar system in Pteridophytes and contribution of Indian pteriodologists.
2. Understand the classification of Pteridophytes, morphological and anatomical characters of various genera.
3. Comparative account among the genera of various classes.
4. Understand the evolutionary tendencies and comparative morphology of Cycadales, Cycadeodales and Pteridospermales.
5. Compare the characters of different orders & relationship of each order from Cordaitales to Gnetales.
6. Differentiate the taxa belong to Ginkogales, Coniferales, Ephedrales, Welwitschiales and Taxales.

Name of Course: Plant GeneticsPaper

code: M-BOT-T- 2.2

At the end of the Programme, the students will be able to:

1. Understand the method of Karyotype Analysis, Euchromatin and Heterochromatin, special types of chromosomes and Sex Chromosomes.

2. Know the structural changes in Chromosomes.
3. Know the interaction of gene and genetic recombination.
4. Understand the role and process of mutation and different mutagenic agents which brings about mutation in the organisms.
5. Genetic Recombination in Bacteria, Viruses and Eukaryotes and mechanism
6. Understand the concept of Population Genetics including Gene Pool, Gene Frequenciesand Hardy-Weinberg Equilibrium of Gene Frequencies.

Name of Course: Plant Physiology

Paper code: M-BOT-T- 2.3

At the end of the Programme, the students will be able to:

1. Have enough understanding about the plant and water relationships and pathways of waterthrough xylem.
2. Have enough understanding about Signal Perception and Transduction.
3. Understand the stress physiology.
4. Understand the physiological effects and mechanism of actionof Auxins, Gibberellins, Cytokinins, Ethylene, Abscisic Acid.
5. Understand the processes involving flowering and senescence.

Name of Course: Plant Biochemistry and

MetabolismPaper code: M-BOT-T- 2.4

At the end of the Programme, the students will be able to:

1. Understand the importance of photosynthesis in plants as well as various types of cycles involved.
2. Know that energy produced by respiration which is essential for normal functioning of plant body.
3. Come to know the importance of metabolism to maintain living state of cells, and variousgrowth regulators.
4. Have enough understanding about the importance of Nitrogen metabolism, lipid and Sulphur metabolism.
5. Explain about the Phytochromes and Cryptochromes.
6. Understand the molecular mechanism of action of Photomorphogenetic receptors.

Name of Course: Ethnobotany and Intellectual Property Rights

Paper code: M-BOT-T- 2.5

At the end of the Programme, the students will be able to:

1. Have enough understanding about the origin, botany, cultivation and uses of food crops.
2. Understand about the origin, botany, cultivation and uses of the fibres, and vegetablecrops.
3. Have enough understanding about the origin, history, botany, cultivation, processing,chemical composition and uses of beverages crops.
4. Have knowledge about the various medicinal plants.
5. Come to know about patents, copyright and trademark.

Name of Course: Environmental Toxicology

Paper code: M-BOT-T- 2.6

At the end of the Programme, the students will be able to:

1. Have enough understanding about toxicity, toxic chemicals in the environment, biochemical aspects of various pollutant and dose- response relationships.
2. understand about the Pesticides and Carcinogens**.**
3. Understand the processes such as biotransformation and bio- activation of Toxicants.
4. Come to know the importance and limitations of bioassays, Ames mutagenicity assay and Disc diffusion assay.
5. Get enough knowledge about cell lines.

Semester III

Name of Course: Plant Anatomy and Reproduction

Paper code: M-BOT-T- 3.1

At the end of the Programme, the students will be able to:

1. Understand the anatomy of root, stem and leaf.
2. Understand the structure of anther and role of gene expression during pollen development.
3. Know about fertilization and how pollen stigma interaction takes place.
4. Understand the relation between embryo and endosperm.
5. Understand about practical importance of polyembryony.
6. Understand how germination of seed takes place in plants.

Name of Course: Ecology and Phytogeography

Paper code: M-BOT-T- 3.2

At the end of the Programme, the students will be able to know:

1. About structure and function of different ecosystems, and Stability (Resistance and Resilience) of Ecosystems.
2. Understand the Law of the Minimum and Law of Tolerance.
3. Know about characteristic features of populations and communities, ecological succession and its models.
4. Learn about the various phytogeographical regions of world, biogeography of major biomes.
5. Know about the Software, Hardware used in GIS (Geographical Information System) and GPS (Geographical Positioning System).
6. Applications of GIS and GPS.

Name of Course: Biostatistics and Bioinformatics

Paper code: M-BOT-T- 3.3

At the end of the Programme, the students will be able to know:

1. The statistical methods involving collection of data, distribution and graphical representation.
2. The application of mean deviation, standard deviation, variance and coefficient of variation,correlation and regression.
3. About the databases including EMBL, DDBJ, GenBank, PIR, SWISS-PROT, PDB, NCBI, EXPASY.
4. Learn about Sequence analysis
5. The concept of Genomics and Proteomics.

Name of Course: Systematics and Diversity of Angiosperms

Paper code: M-BOT-T- 3.4

At the end of the Programme, the students will be able to:

1. Understand the structure and functions of stamens and carpels.
2. Understand the Plant systematics, and recognize the importance of herbarium and virtual herbarium.
3. Know about the theories related to the origin of Angiosperms.

4. Know about the important herbaria and botanical gardens.
5. Understand the rules of ICN in botanical nomenclature.
6. Assess the terms and concepts related to systematics of plants.
7. Know the characters of the different families according to Bentham & Hooker's system of classification.

Name of Course: Principles of Plant Pathology (Optional i)

Paper code: M-BOT-T- 3.5

At the end of the Programme, the students will be able to:

1. Understand the terms such as epidemiology, epiphytotics and disease forecasting.
2. Explain the mechanism of pathogen attack.
3. Explain the importance of chemical weapons.
4. Describe the Impact of Infection on morphological, anatomical and physiological aspects.
5. The mechanism of defence against plant diseases.

Name of Course: Evolutionary Biology (Optional ii)

Paper code: M-BOT-T- 3.6

At the end of the Programme, the students will be able to:

1. Understand the evolutionary thoughts **(**Darwinism and Lamarckism), and paleobotany and evolutionary history.
2. Describe the Origins and evolution of unicellular and multicellular organisms.
3. Understand about Geological time scale and evolution of major plant groups.
4. Understand the use of molecular tools in phylogeny.
5. Describe the population genetics, Fisher's genetic variance, genetic load and genetic death.

Semester IV

Name of Course: Crop Genetics and Plant Breeding

Paper code: M-BOT-T- 4.1

At the end of the Programme, the students will be able to:

1. Describe Green Revolution, Germplasm Evaluation and Conservation.
2. Know the Mechanism and utility of Self- incompatibility.
3. Learn about the plant breeding methods.
4. Describe about the various self and cross pollination methods.
5. Understand breeding techniques such as hybridization and mutation breeding.
6. Describe the importance of quality seeds.
7. Understand the importance of molecular markers.
8. Understand Marker Assisted Selection (MAS) and its importance.

Name of Course: Biodiversity and Global Climate Change

Paper code: M-BOT-T- 4.2

At the end of the Programme, the students will be able to:

1. Familalize with the concept of biodiversity and sustainable management.
2. Understand the ways of biodiversity management (*in situ* and *ex situ* conservation).
3. Know the concept of science of climate change.
4. Understand the terms like climate change finance.
5. Know the challenges and opportunities for Climate Change Action
6. Acquire knowledge about concepts such as international efforts to mitigate climate change.

Name of Course: Plant Tissue Culture and Biotechnology

Paper code: M-BOT-T- 4.3

At the end of the Programme, the students will be able to:

1. Explain the techniques and scope of plant cell and tissue culture.
2. Understand about the types of cultures.
3. Understand about the organogenesis and micropropagation.

4. Understand the concept of Somatic embryogenesis, synthetic seed production, *In vitro* germplasm conservation and Cryopreservation.
5. Understand the concept of somaclonal variations and secondary metabolites of plants.
6. Understand about the gene transfer methods and transgenics.

Name of Course: Plant Resource and Utilization

Paper code: M-BOT-T- 4.4

At the end of the Programme, the students will be able to:

1. Acquire knowledge about economic importance of cereals, sugar crops, fibre crops, oil seedcrops and beverage crops.
2. Acquire knowledge about medicinal and aromatic plants, spices and condiments.
3. Acquire knowledge about the uses of important commercial timbers of India (Teak, Sal, Chir, Kail, Deodar, Shisham).
4. Acquire knowledge about gums, resin, tannins and dyes.
5. Understand deeply about the processing and usage of cocoa and rubber.

Name of Course: Plant Diseases and Management (Optional i)

Paper code: M-BOT-T- 4.5

At the end of the Programme, the students will be able to:

1. Have knowledge about the symptoms, disease cycle caused by Mitosporic Fungi.
2. Describe the Symptoms, disease cycle caused by bacteria.
3. Describe the Symptoms, disease cycle caused by Mollicutes.
4. Describe control measures of diseases caused by various pathogens.

Name of Course: Agricultural Botany (Optional ii)

Paper code: M-BOT-T- 4.6

At the end of the Programme, the students will be able to:

1. Be well versed with concept of centres of origin, cytology and genomic analysis of different field crops and morphology and reproductive biology of important field crops.
2. Understand morphology and reproductive biology of Wheat, Maize, Cotton and *Brassica*.
3. Understand the cytology and genomic analysis of important crops of Punjab (Wheat, Rice, Potato and *Brassica*).

4. Have knowledge about the identification of causal organism, epidemiology, symptoms,disease cycle and management of Wheat, Rice, Maize and Sugarcane.

PG DEPARTMENT OF ZOOLOGY

Session: 2023-2024

Post Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes.

Program Name: M.Sc. ZOOLOGY:

PROGRAM SPECIFIC OUTCOME (M.Sc. ZOOLOGY):

1. Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology.
2. Analyse the relationships among animals, plants and microbes 3. PSO3. Perform procedures as per laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics, Applied Zoology, Clinical science, tools and techniques of Zoology, Toxicology, Entomology, Nematology Sericulture, Biochemistry, Fish biology, Animal biotechnology, Immunology and research methodology.
3. Understand the applications of biological sciences in Apiculture, Aquaculture, Agriculture and Medicine.
4. Gains knowledge about research methodologies, effective communication and skills of problem solving methods.
5. Used the evidences of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They are able to use specific examples to explicate how descent with modification has shaped animal morphology, physiology, life history, and behavior.
6. Explicated the ecological interconnectedness of life on earth by tracing energy and nutrient flows through the environment. They are able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.
7. Subjects such as invasive or endangered species, embryonic development in mammals and ageing in social insects. Lead to advances in medicine to prevent disease amongst both animals and human beings.
8. Developed knowledge and understood of living organisms at several levels of Zoological and Biological organization from the molecular, through to cells and whole organisms and ecosystems all

organs of evolutionary perspectives. Understood how the chemistry and structure of the major biological macromolecules, including proteins and nucleic acids, determines their biological properties.

COURSE SPECIFIC OUTCOME

M.Sc. Zoology

Class / Semester	Course Title	Course Objectives	Course Outcomes
M.Sc. Zoology / Ist	Biosystematics and Taxonomy	To give students a thorough understanding in the principles and practice of biosystematics. This course will help the students to acquire an in depth knowledge on the diversity and relationships existing in the animal world. Taxonomic concepts will help to develop a holistic appreciation of the phylogeny of animal world and of different taxonomic tools used in the classification	On completion of the course, the student is expected to be able to: know the basic concept of biosystematics and procedure in taxonomy. Identified the taxonomic status of the entire animal world and discuss the evolutionary model of the group.
	Evolutionary Biology	This course is aimed at providing an understanding of evolutionary patterns and relationships. The students will be able to get insight into the process and patterns of biological evolution and the role of evolution as the central unifying concept of biology	After completion of the course, student will gain knowledge about, Theories of Evolution, eras and evolution of species, evolutionary process such as variation, speciation, natural selection, origin of primates and man.
	Molecular Biology	To acquaint students the knowledge of concepts of molecular biology, current	After completion of this course students will be able

		biotechnology and its applications.	to: Explain the process of inheritance. Describe how RNA, DNA and proteins are synthesized, mechanisms of life including replication, transcription and translation. Describe process of gene regulation of every vital body activity.
	Developmental Biology	To make students understand the concept of cell signalling, Axis and pattern formation in development.	Students who successfully complete this course will be able to: Outline and compare the developmental stages which occur in a variety of animal phyla. Explain the mechanisms which lead to cell determination. Describe the evolutionary conservation of developmental mechanisms.
	Concepts of Ecology	To define the basic rules and concepts of the ecology science. To define the ecology of individual, population, community and ecosystem. To define the concepts that is	Students who successfully complete this course will be able to: Describe animal

		the ambient, environment, biome, biosphere, ecosphere, ecological relationship and factors, and homeostasis.	distribution patterns in relation to abiotic and biotic factors. Define the essential characteristics underlying natural ecosystems. Explain model population and community-level dynamics. Interpret and present ecological results.
M.Sc. Zoology / IInd	Cytogenetics	The course will enable the students to understand Mendelian and post Mendelian modes of inheritance, Mutation and Genetic analysis.	Students will learn to Demonstrate an advanced knowledge human Cytogenetics and disease; Perform human cell culture, chromosome preparations, karyotyping and analysis of chromosomes; Diagnose and interpret pathology of chromosomes (chromosome aberrations, trisomy, rearrangements etc.
	General Physiology	This course will provide students with the understanding of basic physical and chemical principles underlying the physiological processes and how animals	Students will learn to explain the basic knowledge of *animal physiology*. Defines various

		adapt physiologically to the environment changes.	systems, metabolism, working and abnormalities of the animal body.
	Biochemistry	The course aims at the understanding of metabolic pathways and their linkage, metabolism of primary metabolites – monosaccharaides, lipids, amino acids and the mechanism of enzyme action.	The paper imparts trough knowledge in the fundamentals of biochemistry of all the biomolecules like the carbohydrates, proteins, lipids, nucleic acids, their classification structure and metabolism.
	General Immunology	This course is aimed at providing an understanding of evolutionary patterns and relationships. The students will be able to get insight into the process and patterns of biological evolution and the role of evolution as the central unifying concept of biology	Imparts in depth knowledge of tissues, cells and molecules involved in host defence mechanisms. Understanding of types of immunity CO3 Interactions of antigens, antibodies, complements and other immune components. Understanding of immune mechanisms in disease control, vaccination, process of immune interactions.
	Bioinformatics and Applied Biology	To make the student familiar with the fundamentals of computer and Bioinformatics. To become familiar with sequence. To impart the knowledge of	Students gain skills in basics of computers, operating systems, overview of programming

		biotechnology, different applications of biotechnology to mankind.	languages. Application of internet and statistical bioinformatics in research. Use in recombinant DNA technology, genetic manipulations and in a variety of industrial processes.
	Industrial Zoology	To teach the students both in the classroom and on the field for self-employment in applied branches of Zoology including aquaculture, cattle farming, poultry and meat industry.	On completion of the course, students are able to: 1. Understand the concepts of Aquaculture, poultry and cattle industry. 2. Understand the various Indian breeds and their distribution and characteristics. 3. To aware the students about economic importance of these animals.
M.Sc. Zoology / IIIrd	Animal Behaviour	To understand Animal behaviour and response of animals to different instincts. Various kinds of Animal adaptations	Students who successfully complete this course will be able to: Explain the influence of natural selection on behavior. Describe and give examples of reproductive behaviors and mating strategies employed by

			animals. Explain cooperative and competitive behavioural interactions. Define eusociality and explain the costs and benefits of this strategy.
	General Endocrinology	To learn basic and advanced endocrine biochemistry, physiology and pathophysiology, which provide the basis for understanding endocrine diseases? To accumulate a critical mass of fundamental information and practical approaches for the diagnosis, management and prevention of endocrine disorders	The student will develop an understanding of the role of the endocrine system in maintaining homeostasis and health. The student will be better able to understand the integrative workings of the human body by studying this signaling system.
	Instrumentation and Biostats	Students gain knowledge about various tools & techniques used in biological systems and give them insight about their use in research. Biostatistics teaches them to use the best data analysis methods. Students gain knowledge about statistical methods like measures of central tendencies, Probability. Learns about hypothesis testing and inferential statistics and the problem-solving methods.	Students who successfully complete this course will be able to: Choose an appropriate sampling scheme and/or experimental design for a given biological question. Select and apply the appropriate analytical methods to biological data. Demonstrate the necessary skills for biological data

			management, analysis and graphical presentation. Evaluate critically the primary instrumental requirements observation and experimental biology.
	Cell Signalling	To understand how membrane-bound and nuclear receptors signal. To get deeper knowledge about the functioning and regulation of kinases, GPCRs, nuclear hormone receptors and cytokine receptors. To gain knowledge on the role of cell signaling in development and progression of animals.	After studying this course, students should be able to: define and use each of the terms printed in bold in the text understand the basic principles of signal transduction mechanisms, in particular the concepts of response specificity, signal amplitude and duration, signal integration and intracellular location give examples of different types of extracellular signals and receptors, and explain their functional significance describe the mechanisms by which different receptors may be activated by their respective ligands Describe and give examples of the structure

			and properties of the major components of signal transduction pathways.
	Microbiology	This course is designed to explain the importance of microbial diversity. It describes role of different microorganisms to human.	Students who successfully complete this course will be able to: Describe disease-causing microorganisms and microbial agents at organismal, cellular and/or molecular levels. Relate normal cellular and molecular structures to their functions. Explain cellular processes and mechanisms that lead to physiological functions and pathological state.
M.Sc. Zoology / IVth	Zoogeography, Wildlife and its management	The course is an introduction to wildlife management at the state, national and international level and some of the tools used by wildlife managers. Topics covered include the management of vertebrate pest, wildlife conflict and over abundant species, wildlife health and disease and wildlife utilisation and conservation. In addition to providing a sound scientific and theoretical background on wildlife sciences and management, tutorial activities and a field trip will provide the students with a hands-	After completing this course, students can Demonstrate knowledge of the main components of wildlife management and be able to give examples. They can describe the main management tools and techniques used by wildlife managers. Students can understand the principle of wildlife health

		on experience and practical skills and tools used by wildlife managers.	investigation and be competent in collecting biological samples.
	Histology and Histochemistry	To describe the methods of studying cells and tissues, the specific characteristic of cell components in relation to the functions of each component, the scientific basis of tissue preparation. Histochemistry combines the techniques of biochemistry and histology in the study of the chemical constitution of cells and tissues.	On completion of the course, students are able to: Understand the terms Histology and Histochemistry. Correlate between histological structure & function of any cell or tissue. Handle the histological glass slides and examine them using the maximum microscopic facilities. Identify various types of stains & micro techniques.
	Bio -Techniques	Understanding of basic concepts of instrumentation, to gain skills in techniques of chromatography, electrophoresis, spectroscopy and radioisotopes, to gain skills in histological, immunological and electrophysiological techniques.	Students can learn the basic principles of analyses and detection systems involved in molecular biology techniques, chromatographic, principles of electrophoresis and immunochemical techniques and discuss how these techniques can be

			used in molecular medicine.
	Fish and Fisheries	Course provides the students comprehensive understanding about aquatic ecosystem and various economical important fishes. It helps in Understanding of embryogenesis - Early development and post embryonic development. Understanding of fish habits and habitats and their functional anatomy.	Students gain knowledge in the areas of responses characterization and classification of fishes. Students gain knowledge of integumentary system - basic structure of skin, dermal and epidermal pigments, fins, and scales. The students will be well equipped to become very competent in research or teaching fields
	Parasitology	To study and understand the scope of parasitology. To aware the students for various parasites and diseases which spreads in human with the help of study of host-parasite relationship. To increase awareness for the health in students. To understand the various disease causing vectors like Mosquitoes. To aware about the typhoid, cholera like disease.	Students who successfully complete this course will be able to: Explain basics of the parasitic life-mode in context of ecological and evolutionary forces. Apply basic physiological, evolutionary and ecological concepts to parasitic relationships. Identify major parasitic groups, and describe their key characteristics. Describe the impact of

			parasitic infections on human health and history. Explain medical and public health aspects of human parasitic infections.
	Entomology	To give knowledge of insect identification, morphology, anatomy and physiology through body segments, internal organs and metabolic processes study.	Students will learn a complete knowledge about basics of insect body, its morphology, its internal working and biochemical processes for further usage in any form in favour or against the insects.
	Research Project	To facilitate Higher education and research in zoology. To provide quality education offering skill based programs and motivate the students for self-employment in applied branches of Zoology. To inculcate the value based education and entrepreneurial skills among the students.	Achieve excellence in education and scientific research in the field of Zoology. Develop and implement ways and means to ensure quality performance and outputs of the project. Optimal use of modern technology in education and scientific research. Implementation of advanced training to improve the skills of graduates in Zoology and related fields

P.G Department of English

SESSION: 2023-24

Post Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: M.A. English I

Programme Outcomes (PO): (In the following form)

1. Students will get an opportunity to delve deep in the world of literature.
2. Students will have a better understanding of history of English literature especially about the periods mentioned in the title of the paper.
3. The course will familiarise the students with different form of poetry.

Programme Specific Outcome (PSO)

1. Students will get an opportunity to delve deep in the world of literature.
2. Students will have a better understanding of history of English literature especially about the periods mentioned in the title of the paper.
3. The course will familiarise the students with different form of poetry.
4. Students will have an ample knowledge relating to the development of drama from Classical to Elizabethan age.
5. The study of the course will enhance the understanding of fundamentals of drama.
6. The course will familiarise the students with dramas of different eras.

(Semester-I)

MAE 001(Core Course-I)

Introduction to Poetry: Medieval & Renaissance

Course Outcome (CO)

1. Students will get an opportunity to delve deep in the world of literature.
2. Students will have a better understanding of history of English literature especially about the periods mentioned in the title of the paper.
3. The course will familiarise the students with different form of poetry.

MAE 002 (Core Course-II)

Classical and Elizabethan Drama

Course Outcome (CO)

1. Students will have an ample knowledge relating to the development of drama from Classical to Elizabethan age.
2. The study of the course will enhance the understanding of fundamentals of drama. The course will familiarise the students with dramas of different eras.

MAE 003 (Core Course-III)

Beginnings of the Novel

Course Outcome (CO)

1. Students will develop acumen to analyse the fiction from various perspectives.
2. To make the students familiarize with the factors leading to the rise of the novel.
3. To make the students understand the novels of different eras.
4. Students will have an ample knowledge relating to the beginning and development of fiction.
5. The students will be able to analyse the fiction as a genre.

MAE 004A [Elective Course-IV-(i)]

English Phonetics and Phonology

Course Outcome (CO)

1. By the end of the course, the students will have basic insights into the sound system of English and the central analytic concepts of phonetics and phonology.
2. They will be able to understand how speech sounds are used to create meanings and how appropriate sounds are vital to the sense of an utterance.
3. They will be able to apply this knowledge to improve their own pronunciation and to analyze linguistic material.
4. The command over linguistic concepts will give the students an edge in their professional prospects.

MAE 004B [Elective Course-IV-(ii)]

William Shakespeare: From Stage to Screen

Course Outcome (CO)

1. Students will get acquainted with Shakespeare and his dramas.
2. Students will learn the important attributes of Shakespearean comedy, tragedy and tragicomedy.
3. Students will also gather the knowledge about the contribution of Shakespeare to literature.

MAE 005 (Seminar)

Course Outcome (CO)

1. Research aptitude of students will improve.
2. Students will inculcate the presentation skills along with public speaking skills.
3. Argumentative approach will also develop among the students.

(Semester-II)

MAE 006 (Core Course-VI)

Literary Criticism

Course Outcome (CO)

1. After completing the course, the students will understand the function of criticism in relation to literary works.
2. Studying different critical traditions will help them to cultivate the critical faculty.
3. Students will be equipped with a working knowledge of the dominant concepts, terms and trends in literary criticism.
4. Acquaint themselves with the works of principal literary critics and theoreticians.

MAE 007 (Core Course-VII)

Poetry from Neo-Classical to Victorian Age

Course Outcome (CO)

1. Students will get acquainted with the social, historical, literary and cultural elements of Neoclassical and Victorian poetry.

2. Students will be able to analyze and appreciate the representative poems of Neo-classical and Victorian Poetry.
3. Students will get familiarized with the thematic issues related to Neo-classical and Victorian poetry.

MAE 008 (Core Course-VIII)

Nineteenth Century Fiction

Course Outcome (CO)

1. Interest to read literary fiction from different parts of the world will develop among the students.
2. The students will understand how society and culture played a significant role in the lives of the writers of a particular nation.
3. The students will be able to comprehend the variations in the form and content of fictional works from across the globe.

MAE 009A [Elective Course-IX (i)]

Modern Drama

Course Outcome (CO)

1. Students will get acquainted with the concept of modernism and its relation to drama.
2. Ample knowledge will be acquired by the students about modern playwrights.
3. Students will get familiarized with the emergence and evolution of the modern drama.

MAE 009B [Elective Course-IX (ii)]

South Asian Literature

Course Outcome (CO)

1. An inclination will develop among the students relating to the social, historical, literary and cultural elements of South Asian Literature.
2. Students will be able to critically analyse the works of South Asian Literature.
3. The study of writers belonging to varied cultural backgrounds will enhance the idea of global belongingness.

MAE 009C [Elective Course-IX (iii)]

Modern English Grammar and Usage

Course Outcome (CO)

1. Students will get acquainted with the basics of English grammar.
2. The study of this paper will enhance the communication skills of the students.
3. The grasp over communicative language will create more job opportunities.

MAE 010 (Seminar)

Course Outcome (CO)

1. Research aptitude of students will improve.
2. Students will inculcate the presentation skills along with public speaking skills.
3. Argumentative approach will also develop among the students.

(Semester-III)

MAE 011 (Core Course XI)

Literature and Modernity

Course Outcome (CO)

1. The study of this paper will enhance the critical thinking of the students.
2. Students will obtain ample knowledge about the various critical approaches.
3. Students will thoroughly understand the concept of modernity and its relationship with literature.

MAE 012 (Core Course XII)

Twentieth Century Poetry and Fiction

Course Outcome (CO)

1. The students will be able to comprehend the variations in the form and content of fictional and poetical works.
2. The students will be able to appreciate and understand the paradigm shift in the field of poetry and fiction.

3. The students will be able to deduce the difference between the concepts of existentialism and utilitarianism.

MAE 013 (Core Course XIII)

Literature and Post coloniality

Course Outcome (CO)

1. Students will be able to interpret the texts in the light of colonial and postcolonial theories.
2. The impact of colonialism on the overall social structures will be learnt by the students.
3. The students will develop varied perspectives and approaches towards the texts.

MAE 014A [Elective Course XIV (i)]

Literature and Gender

Course Outcome (CO)

1. Students will be able to analyze literary texts through the perspectives of gender.
2. Identify some of main topics in women's literature in English that concern gender studies.
3. Detect myths and representations of womanhood and women's responses to those myths and representations and to other cultural impulses.

MAE 014B [Elective Course XIV (ii)]

Creative Writing

Course Outcome (CO)

1. The writing skills of the students will develop.
2. Students will demonstrate an ability to revise and edit for content, grammatical and stylistic clarity.
3. The imaginative faculty of the students will develop that will open up new avenues for them.

MAE 014C [Elective Course XIV (iii)]

Modern Indian Literature in Translation

Course Outcome (CO)

1. Students will get acquainted with modern Indian writers.
2. Students will get an exposure to the major authors, texts and contexts.
3. Develop a broader knowledge of human ideas, beliefs, and social values through the study of the prescribed texts.
4. Develop a comparative perspective to study the texts.
5. Students will be able to critically respond to Indian texts.

MAE 015 (Seminar)

Course Outcome (CO)

1. Research aptitude of students will improve.
2. Students will inculcate the presentation skills along with public speaking skills.
3. Argumentative approach will also develop among the students.

(Semester-IV)

MAE 016 (Core Course XVI)

Literary and Cultural Theory

Course Outcome (CO)

1. Students will get acquainted with the principal literary theories.
2. Students will get familiarized with recent critical trends like structuralism, feminism, post-modernism and post-colonialism.
3. Students will be able to compare and contrast the unique qualities of the authors under consideration.

MAE 017 Core Course XVII

European Drama

Course Outcome (CO)

1. Students will develop a broader knowledge of human ideas, beliefs and social values through the study of prescribed European literary texts.

2. Students will understand the European style, form and content of writing.
3. Students will get acquainted with general trends in European literature over the ages.

MAE 018 Core Course XVIII

American Literature

Course Outcome (CO)

1. Students will learn about the history and development of American Literature.
2. Students will understand the American literary texts in terms of themes, forms and socio historical context.
3. Students will comprehend the unyielding American Dream.

MAE 019A [Elective Course XIX (i)]

Literature and Politics

Course Outcome (CO)

1. Students will exhibit an ability to interpret the political connotations of literary texts.
2. Students will understand the various political concepts-such as capitalism, democracy, freedom, equality, community, oppression and racism etc.
3. Students will develop critical thinking skills to evaluate the political environment.

MAE 019B [Elective Course XIX (ii)]

Literary Non-Fiction

Course Outcome (CO)

1. Students will learn to review and analyze literary elements in non-fiction.
2. An understanding to differentiate between fiction and non-fiction will develop among the students.
3. Students will learn the value of reason and imagination as discussed by different authors in their texts.

MAE 019C [Elective Course XIX (iii)]

Indian Writing in English

Course Outcome (CO)

1. Students will get familiar with major Indian writers and their works.
2. Students will get meaningful insights of the Indian social, cultural milieu through the prescribed texts.
3. Identify the significance and relevance of the works prescribed and relate to the ideas embedded in them.

MAE 020 (Seminar)

Course Outcome (CO)

1. Research aptitude of students will improve.
2. Students will inculcate the presentation skills along with public speaking skills.
3. Argumentative approach will also develop among the students.

PG Department of Punjabi

Session: 2023-24

Post Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Programme Name: M.A PUNJABI

Programme Specific Outcome

The dawn of the 21st century and third millennium has, hopeably, ushered in an era qualitatively different from the earlier ones in terms of foundational postulates, value systems, mindset and life styles. Higher education in the present century comes face to face with challenges, new tasks and new opportunities. As a significant means of development of human resource, education will have to play a significant role in shaping the 21st century society and the third millennium civilization. The process will affect not only the market economy of the nation as a whole, but also the whole system of higher education, which has to prepare its graduates for participation in the social and the economic development of the country, and the type of the cultural environment and ethics it will need to foster. Information technology is further contributing to this dynamic change and will have major impact on the structure, management and mode of delivery of the educational system.

All of us are conscious of the fact that through the process of crisis in higher education, several crucial areas have emerged in which the university system has to re-examine itself and its relationship with social and economic development. These include the relevance and quality of education, the gradual process of internationalization of education as not only students and faculty cross borders but even the system of education are doing so. There is also a concomitant demand for accountability.

The department of Punjabi with its Post-graduate programme, intends to preserve furtherand disseminate the various aspects and forms of ancient Indian knowledge traditions in modern perspectives. The programme aims at equipping enabling future researchers with the fundamental concepts, theories and practices of different knowledge domains. To empower the students with modern and scientific tools, inter-disciplinary approach and to design such modules to help them in becoming good citizens are some of the main objectives of the course.

The syllabus of M.A. (Punjabi) was restructured with a futuristic approach, keeping in mind the new challenges of Globalisation and Post-situations.

Course Outcome

1. To analyse literature and to write òn literary topics at an advanced level.
2. Course will help to develop complex reading, writing and research skills.
3. Students will be able to express knowledge to literary terms, major periods and authors.
4. Students will manifest the knowledge of 'best practices' regarding,research, writing, teaching and the academic profession of academic studies.
5. Students will reveal an appreciation for literary theory.
6. The course motivates the students to indulge in literary creation. This is a career oriented course. Students can enter various fields such as academics,research and media.

Course Outcomes

Course Code: PUN101&201

COURSE NAME: Punjabi Sahit da Itihas

Course Learning Outcomes:

- Students will have an understanding of knowledge of Punjabi Literature of ancient, medieval andmodern periods .
- Students will have an understanding of major approaches to the study of literature (theology,sociology, social ethics, philosophy, history).

Course Code: PUN102&202

COURSE NAME: Sahit Alochna de Sidhant

Course Learning Outcomes:

- An understanding of the major methods and interpretive theories in the field of literary studies.
- Students will develop an ability to propose arguments that present, develop, and defend insightful claims about texts through formal analysis, engagement with existing criticism, and when appropriate, engagement with primary and secondary material from the historical period.
- They will develop a feeling of belongingness through the reading of literary theories in the western academics.

Course Code: PUN103&203

COURSE NAME: Punjabi Natak & Balwant Gargi vishesh adhiyan,Ajmer singh AloukhVishesh adhiyan

Course Learning Outcomes:

- Students will demonstrate an understanding of terms, themes, strategies, and issues of PunjabiDrama.
- They can express their understanding of the relationship between Punjabi Drama and thehistorical/cultural contexts in which it was written.
- They will be able to read and analyze drama of various periods and representing various points ofview, including gender, ethnic identity and different cultures.

Course Code: PUN104&204

COURSE NAME: Adhunik Punjabi Kav & Birtantik Kav

Course Learning Outcomes:

- Students will understand the common techniques underlying Free Verse and traditional forms ofpoetry.
- They will understand the basic terminology and practical elements of poetry.
- They will be able to learn about the sensitivity of the poet

Course Code: PUN105&205

COURSE NAME: Madhkali Punjabi Galap & Adhunik Punjabi Galap

Course Learning Outcomes:

- Students will have the ability to apply critical and theoretical approaches to the reading and analysis of literary texts in the genres of Novel and Stories.
- Students will be able to identify, analyze, interpret and describe the critical ideas, values, and themes that appear in the prescribed texts and to understand the ways these ideas, values, and themes inform and impact cultures and societies, both during the past and the present.
- They will understand the social and political concerns of Punjabi society, as reflected in Punjabifiction.

Semester III & IV

Course Code: PUN301&401

COURSE NAME: Bhasha Vigiyaan ate Punjabi Bhasha

Course Learning Outcomes:

- Students will have advanced knowledge about Punjabi language and linguistics and insight intovariation in various dialects of Punjabi language.
- They will have in-depth knowledge of selected areas of linguistics, such as, language variation,language development, language learning.

- They will have advanced knowledge of linguistic theory and research methods in general andcorpus approaches in particular.
- They will understand the phonology, morphology and syntax structure of Punjabi language.

Course Code: PUN302 and PUN402

COURSE NAME: Sabhiyachar ate Punjabi SabheyacharAnd Lokdhara ate Punjabi Lokdhara

Course Learning Outcomes:

- Students will demonstrate the knowledge of Folk-literature, Folk-traditions and customsrituals ofPunjab.
- Students will examine Punjab's folklore and culture theoretically and will explore themselves bystudying traces of Punjabi culture.
- Students will be able to understand the current problems occurring in Punjabi society and can tryto find the appropriate way to handle them.

Course Code: PUN303A&B and 403A&B

COURSE NAME: Gurmat Kaav And Guru Nanak Dev Vishesh Adhiyan and Guru Arjan Dev Vishesh Adhiyan

Course Learning Outcomes:

- Students will be able to analyze major Medieval Guru Poets, their works and their representationsof the human experiences.
- Students will learn about ethics, ecology, social behaviours and concerns.
- They will be able to meet the contemporary challenges and solutions.

Course Code: PUN304 And PUN 404

COURSE NAME: Punjabi Vaartak Course Learning Outcomes:

- Students will demonstrate an understanding of literary terms, themes, strategies, and issues of thePunjabi prose as are relevant to the works being studied.
- Students will express their understanding regarding Punjabi prose and its historical/culturalcontexts in which it was written.
- Students are expected to gain sufficient knowledge related to various genres of Punjabi prose andare expected to enhance their skill of reading and writing.

Course Code: PUN305 &PUN405

COURSE NAME: Punjabi Sufi Kaav ate Bir Kav And Qissa Kav

Course Learning Outcomes:

- Students will demonstrate the knowledge of the history of Sufism and major events andpersonalities of Punjabi Sufi ,Bir and Qissa Poetry.
- Students will be able to examine the religious diversity of the middle ages and reflection of humanexperiences of shared spaces in the society.
- Students will examine Punjab's religion and culture through multiple poetic texts.
- They will develop the sense of awareness about the environment and its various problems and to help them in realizing the inter-relationship between man and environment.
- The paper provides in-depth knowledge of theory, history and tendencies of medievalPunjabi love poetry and Ballads.

PG Department of History

Session 2023-24

Post Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Programme Name: M.A HISTORY

Programme outcomes

1. Teaching in Universities, Colleges and Schools.
2. Helpful for Civil Service Exams: IAS, IPS, State Civil Services.
3. National and International Organization.
4. Public Relations Department.
5. Research.
6. Develop leadership qualities in Students.

Programme specific outcomes

1. To develop the overall personality of the students.
2. To introduce the students about every aspect of the History.
3. To provide the best professional opportunities to the students and look forward to their bright future.
4. To encourage the students for competitive exam

Course Outcomes

M.A HISTORY SEM Ist

PAPER 1ST HISTORY OF PUNJAB (A.D1469-1675)

1. To introduce the students about Punjab history, specific about Sikh Guru's.
2. Students can learn about teachings and life of sikh guru's.

PAPER 2nd HISTORY OF WORLD (A.D 1500-1815)

1. To introduce the students about world history.
2. Students can learn about the changes in social activities which occurred in between the time of (1500-1815 AD).
3. Students can learn about the revolution of French.

PAPER 3rd HISTORY OF WORLD (A.D 1815-1871)

1. To introduce the students about world history.

2. To introduce the students about world history of 19th century.
3. Students can learn about the Unification of Germany and Italy.

PAPER 4th HISTORY OF CHINA AND JAPAN (A.D. 1830-1911) (opt.-1)

1. To introduce the students about history of china and japan.

M.A HISTORY SEM IInd

PAPER 1ST HISTORY OF PUNJAB (A.D 1675-1799)

1. To introduce the students about history of Sikhs from 1675 to 1799 AD
2. Students can learn about Martyrdom of Sri Guru Teg Bahadur ji, and the about Guru Gobind Singh ji.

PAPER 2nd HISTORY OF WORLD (A.D 1871-1919)

1. To introduce the students about world history.

PAPER 3rd HISTORY OF WORLD (A.D 1919-1991)

1. To introduce the students about world history.

PAPER 4th HISTORY OF CHINA AND JAPAN (A.D.1911-1949) **(opt.-1)**

1. To introduce the students about history of china and japan.

M.A HISTORY SEM IIIrd

PAPER 1ST HISTORY OF PUNJAB (A.D 1799-1849)

1. To introduce the students about history of Sikhs from 1799 to 1849 AD
2. Students can read about empire of Maharaja Ranjit Singh and about annexation of Punjab.

PAPER 2nd HISTORY OF INDIA (A.D 1707-1772)

1. To introduce the students about history of India.
2. Students can read about decline of Mughal empire and rise and expansion of Maratha Power.

PAPER 3rd HISTORY OF INDIA(A.D 1818-1947)

1. To introduce the students about British history in India.

PAPER 4th NATIONAL MOVEMENT IN INDIA AND CONSTITUTIONAL DEVELOPMENT (A.D 1858-1930)

1. To introduce the students about National movement in India.

M.A HISTORY SEM IVTH

PAPER 1ST HISTORY OF PUNJAB (A.D 1849-1947)

1. To introduce the students about history of Sikhs from 1849-1947 AD

PAPER 2nd HISTORY OF INDIA (A.D 1772-1818)

1. To introduce the students about history of India.
2. Students can learn the policies of British's how they over come on India.

PAPER 3rd SOCIAL AND ECONOMIC HISTORY OF MODERN INDIA (A.D 1818-1947)

1. To introduce the students about social, economic and cultural history of modern India.

PAPER 4th NATIONAL MOVEMENT IN INDIA AND CONSTITUTIONAL DEVELOPMENT (A.D 1930-1947)

1. To enable students to comprehend the influence of diverse perspectives and values articulated during the national movement.

PG Department of Political Science

Session- 2023-24

Post Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes.

Programme Name: MA Political Science

Program Outcomes:-

- To acquaint a student with conventional as well as contemporary areas in the discipline of Political Science.
- To enable a student well versed in national as well as international trends.
- To enable the students for conducting politics and law related practices, role of regulatory bodies in political and international sectors, nature of various political institutions.
- To provide in-depth understanding of all core areas specifically advanced national, international politics, emerging trends, recent theories, research methodology and global politics.

Program Specific Outcomes:-

After the completion of the Master's course, a student is able

- For pursuing research in their chosen areas.
- For teaching in schools and colleges after qualifying requisite tests.
- For working as political advisor.
- For working or participating in political institutions, political groups and international political sector.

Course Outcomes:-

SEMESTER- I

MAPOLSCI-101 – Indian Political Thought-1

- The paper will provide students a basic understanding over some critical issues and debates within Indian Political thought.

MAPOLSCI-102 – Western Political Thought

- The paper will provide students a preliminary understanding over major themes within western political thought.

MAPOLSCI-103 –Indian Government and Politics

- The paper will provide students a fundamental understanding of working of Indian Government in backdrop of critical constitutional debates.

MAPOLSCI-104(1) –International Politics

- The paper will provide students an understanding of key theories and issues in international politics.

MAPOLSCI-105 –Seminar/Project Work

- The paper will make the students construct logical arguments and interpret evidences, data and formulate reasoned conclusions. It will also increase understanding of political science research and analytical skills of the students.

SEMESTER- II

MAPOLSCI-201 –Indian Political Thought-2

- The paper will provide students a preliminary understanding of Indian Political thought developed during freedom struggle.

MAPOLSCI-202 –Contemporary Issues in International Relations

- The paper will provide students an understanding of key issues and also helps to identify major challenges in global politics in the twenty first century.

MAPOLSCI-203 –Liberal Political Theory

- The paper will provide students an understanding of liberal political ideology developed by western political thinkers.

MAPOLSCI-204(1) -Political Process in India

- This paper will provide students an understanding of democratic institutions and processes and emerging trends in Indian democracy.

MAPOLSCI-205 –Seminar/Project Work

- The paper will enhance the presentation skills of the students. It will help them to do extensive research on various political issues and will improve the research aptitude of the students.

SEMESTER- III

MAPOLSCI-301 –Contemporary Political Thought

- This paper will provide students an understanding of major themes of comparative political thought.

MAPOLSCI-302 –Modern Political Analysis

- This paper will provide students an understanding to the key concepts which are the building blocks of modern political analysis.

MAPOLSCI-303 –Punjab Politics

- This paper will provide students to the key concepts which are the building blocks of Punjab politics. Each concept will be studied in terms of the main debates over its nature and scope in the discipline and its relationship with other concepts.

MAPOLSCI-304(1) –Foreign Policy of India

- The paper will provide students a preliminary understanding of the underline changes, which the shifting nature of world has induced into the more enduring elements and themes of Indian foreign policy.

MAPOLSCI-305 –Seminar/Project work

- The paper will enhance the presentation skills of the students. It will help them to do extensive research on various political issues and will improve the research aptitude of the students.

SEMESTER- IV

MAPOLSCI-401 –Political Theory

- The paper will provide students a preliminary understanding of recent debates and theories concerning advanced industrial societies and will be undertaken in a comparative framework.

MAPOLSCI-402 –Comparative Politics

- The paper will provide students a preliminary understanding of comparative politics and relevant topics of comparative politics.

MAPOLSCI-403 –Political Ideologies

- The paper will provide students an understanding of the major themes of political ideologies. This will be done by undertaking an in-depth study of the various ideologies of the tradition.

MAPOLSCI-404(1) – State Politics in India

- The paper will provide students a preliminary understanding of the key concepts which are the building blocks of the state politics in India.

MAPOLSCI-405 –Seminar/Project work

- The paper will enhance the presentation skills of the students. It will help them to do extensive research on various political issues and will improve the research aptitude of the students.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF ECONOMICS

SESSION: 2023-24

Post Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes(COs) of the Programmes

Program: M.A Economics

PROGRAMME OUTCOMES (POs)

1. Deep insight about the key indicators of economics which help the students to know about the working of economic variables, business cycles, international economic indicators to make international economic comparisons, working of economic policies and their impact at micro and macro level.
2. It also helps the students to know about the functioning of production sector viz. agriculture, industry and services and their effect on household sector.
3. It also equips the students with knowledge to make them more logical and realistic.

PROGRAMME SPECIFIC OUTCOMES

1. The Programme will help the students to develop a realistic view which make them competitive globally. It will enhance their overall knowledge and help them to fetch jobs both in public and private domain.
2. The students can compete easily for different jobs like economic services, insurance sector, banking and other private jobs.
3. It also helps to equip more knowledge about business environment and to start their own venture and help them self employment.
4. To equip students with advanced knowledge of Economics & Development Issues of Indian Economy in general and Punjab Economy in particular
5. To familiarise the students with suitable alternative methods of knowledge on the basis of the heterogeneity of societies.
6. To develop right skills in students catering to the needs of the industry and policy makers.
7. To make the students capable of addressing and solving the issues in the society and the economy by contextualizing the knowledge they have acquired and finally.

8. To create academic excellence through holistic education.

COURSE OUTCOMES

SEMESTER - I

Eco.-101: Micro-Economic Analysis

Outcomes

1. Identify appropriate economic models (e.g., models of perfectly competitive markets and various market imperfections) and apply them to analyse and predict the behaviour of individuals and firms interacting in markets.
2. Articulate how individuals and society as a whole benefit or are harmed by economic markets.

Eco.-102 Macro-Economic Analysis Outcomes

1. To enhance the analytical skills of the student towards understanding the developments in the economy.
2. To introduce the student to the art of abstracting and building small models related to the macroeconomics.

Eco.-103 Basic Quantitative Methods-I

Outcomes

1. To improve the basic mathematical skills of the students by familiarizing them with Set Theory and for economic decision-making.
2. To Acquire applied knowledge of Matrices and determinants.

Elective Papers: Any one of the following paper

Eco.-104 (i) Economics of Growth and Development I Outcomes

1. Analyze the reasons behind persistence of poverty and inequality in developing countries.
2. Identify problems faced by developing countries and suggest suitable policies for tackling them.

Eco.-104(ii) Economics of Demography I

Outcomes

1. They compare and evaluate the growth and development trends of the national as well as regional economies.
2. Students recognize the implication of institutional changes

Eco.104 (iii) Economics of Gender and Development I

Outcomes

1. Students explore the links and interconnectedness between policies and outcomes.
2. Students apply theoretical knowledge to assess development outcomes.

Elective Papers: Any one of the following paper

Eco.-105(i) Economics of Agriculture I

Outcomes

1. Students evaluate the performance of agricultural
2. Students identify the implications of land system and land reforms.
3. Students recognize various problems related to capital formation in agriculture.
4. Students critically evaluate food security and public distribution system in India.

Eco-105 (ii) Economics of Industry-I

Outcomes

1. To perceive the importance of trade in contributing to development.
2. To understand the issues in external sector of developing countries in development

ECO-105 (iii) ECONOMICS OF LABOUR

Outcomes

1. To examine education and employment in the local labour market.
2. Issues pertaining to the labour market, wage theories, employment policies, trade unions and collective bargaining in the globalised economy have become vitally important for developing countries.

ECO-105 (IV) HISTORY OF ECONOMICS THOUGHT-I

Outcomes

1. To give a detailed account on the development of economic thought in a global perspective.
2. To have a good understanding on various traditions and schools of economics, which influenced the shaping of present world in its current state

SEMESTER – II

ECO-201: MICRO ECONOMICS ANALSIS-II

Outcomes

1. Develop basic understanding of the concepts of game theory, classifications of the games, solution concepts and market interdependence.
2. Acquire basic toolkit from game theory; develop skills in the translation of economic problems into game-theoretic framework; be able to select an appropriate solution concept;
3. Be able to compute equilibrium strategies in standard Oligopolistic models under Quantity and Price Competition.

ECO-202: MACRO ECONOMICS ANALSIS-II

Outcomes

1. Grasping the effectiveness of fiscal and monetary policies under different exchanges rate regimes through Mundell-Fleming model.
2. To evaluate various theories of Inflation.
3. To know the effectiveness of Marco-economics Policy for Stabilization and Growth.

ECO-203: Statistical Method Outcomes

1. To conduct exploratory data analysis using a range of Graphical, Tabular and Numerical tools
2. To provide a strong foundation in probability theory and statistical inference, especially emphasizing topics required for the study real situations in the Market.
3. To analyze problems pertaining to economics and business.

ECO-204(i): ECONOMICS OF GROWTH AND DEVELOPMENT

Outcomes

1. Identify problems faced by developing countries and suggest suitable policies for tackling them.
2. Apply the micro- and macro-theoretic tools learnt, for analyzing various development issues.
3. Evaluate the role of institutions in economic growth.

4. Analyze the performance of Trade liberalization policies and their effects on human deprivation in developing economies.

ECO-204(ii): ECONOMICS OF DEMOGRAPHY-II

Outcomes

1. To evaluate the role of population and human capital in economic development.
2. To recognize various problems in human capital formations

ECO-204 (iii): ECONOMICS OF GENDER AND DEVELOPMENT

Outcomes

1. Understand the Impact of technological development and modernization on women's work participation in general and in various sectors such as agriculture , non-agriculture rural activities, small and cottage industries

ECO-205 (i): ECONOMICS OF AGRICULTURE-II

Outcomes

1. To develop a critique of agricultural marketing and state policy related to price and liberalization
2. To illustrate the problems related to globalisation of Indian economy

ECO-205 (ii): ECONOMICS OF INDUSTRY-II

Outcomes

1. To introduce the Students to the field of Industrial Organization and prepare them to pursue research in this field.
2. To apply the analytical models to new situations in industry industrial application in social life.
3. To use the experiences of industrial originations on a wide range of exercises to evaluate its implications

ECO-205 (iii): ECONOMICS OF LABOUR

Outcomes

1. Develop skills in analysing local labour market dynamics
2. Evaluate the local employment characteristics
3. Develop skills for analyzing problems in the labour market and frame strategies for the smooth functioning of the labour market.

ECO-205 (IV): HISTORY OF ECONOMICS THOUGHT

Outcomes

1. To critically analyse the Marxian, Marginalist and Keynesian ideas which shape the societies and economies.
2. To make aware how the restatement of this ancient thought gave way to various societal order including feudalism, and capitalism keeping a historical grand classification of medieval world.

SEMESTER – III

ECO--301: POLITICAL ECONOMY OF DEVELOPMENT-I

Outcomes

1. To give a detailed account on the development of economic thought in a global perspective.
2. To have a good understanding on various traditions and schools of economics, which influenced the shaping of present world in its current state

ECO-302: EVOLUTION AND STRUCTURE OF INDIAN ECONOMY-I

Outcomes

1. Students understand factual information on Indian economy.
2. They analyse sectoral performance of the economy.
3. Students use relevant statistics to analyse the implication of various economic policies
4. They compare and evaluate the growth and development trends of the national as well as regional economies

ECO-303: PUBLIC ECONOMICS-I

Outcomes

1. Able to understand the need for government in the economy and different explanations for it
2. understand the public choice and voting mechanism provision of public goods in the economy
3. analyze the problem posed by externalities and how is it managed efficiently
4. understand different tenets of taxation as incidence, equity and efficiency
5. discuss the trade-off between equity and efficiency of taxes

ECO-304: INTERNATIONAL ECONOMICS

Outcomes

1. Understand basis of gainful trade between countries
2. The students will be introduced the models of international trade
3. Students will improve their understanding of the ways by which theoretical models can be used to carry out empirical research

ECO-304 (ii): COMPUTER APPLICATIONS FOR ECONOMISTS–I

Outcomes

1. In this type of learning outcomes, student learn problem solving skills.
2. To become familiar with basic knowledge of computer

ECO-304 (iii): REGIONAL ECONOMICS AND PUNJAB ECONOMY

Outcomes

1. Apply theoretical and practical approaches for policy evaluation
2. analyse the problem posed by externalities and how is it managed efficiently
3. understand different tenets of taxation as incidence, equity and efficiency

ECO-305 (i): MONEY AND BANKING

Outcomes

1. Students will be familiarized with the most recent change in banking sector and empirical analysis
2. Students will be equipped to undertake empirical analysis of Money Supply.

ECO-305 (ii): THEORY OF STATISTICS

Outcomes

1. To help students understand and use the mathematics required for studying economics at the master's level
2. to study the nature and extent of relationships among economic variables
3. to apply these tools and techniques in solving the economic and business problems

ECO-305 (iii): MATHEMATICAL ECONOMICS

Outcomes

1. To illustrate the mathematical concepts studied with applications in economics.

2. To examine market behavior in consumer context with mathematical expressions.

ECO-305 (IV): ECONOMETRICS

Outcomes

1. To illustrate the mathematical concepts studied with applications in economics.
2. To examine producer's behavior in local context

SEMESTER – IV

ECO -401: POLITICAL ECONOMY OF DEVELOPMENT

Outcomes

1. To give a detailed account on the development of economic thought in a global perspective.
2. To have a good understanding on various traditions and schools of economics, which influenced the shaping of present world in its current state

ECO-402: EVOLUTION AND STRUCTURE OF INDIAN ECONOMY-II

Outcomes

1. Students understand factual information on Indian economy.
2. They analyse sectoral performance of the economy.
3. Students use relevant statistics to analyse the implication of various economic policies.
4. They compare and evaluate the growth and development trends of the national as well as regional economies
5. Students evaluate the performance of industrial sector
6. Students identify the implications of changes in industrial policy reforms.
7. Students recognise various problems related to globalisation and FDI.

ECO-403: PUBLIC ECONOMICS-II

Outcomes

1. Students organise data and performance indicators of the economy to hypothesise the relationships between policies and performance.
2. The students are expected to combine the understanding of the data and policies to organise critical examination of the growth process
3. Understand and rationalises the issues of fiscal federalism in a theoretical and empirical context

ECO-404 (i): INTERNATIONAL ECONOMICS-II

Outcomes

1. Understand basis of gainful trade between countries
2. The students will be introduced the models of international trade
3. Students will improve their understanding of the ways by which theoretical models can be used to carry out empirical research.
4. Students will be able to discuss and explain contemporary and day-to-day policy issues such as the effects of specific trade policy changes by a country, trade protection effects of free trade agreements, dumping and anticompetitive practices etc.
5. Explain the connection between different theoretical models and approaches used to understand the exchange rate determination and other practical policy issues related to fiscal and monetary policies, inflation management, trade balance etc.
6. Understand the relevant connections between theory and real-world examples, through different policies, readings and case studies

ECO-404 (ii): COMPUTER APPLICATIONS FOR ECONOMISTS-II

Outcomes

1. Cross-section data analysis using simple regression technique with the help of software.
2. To Acquire thorough understanding of data analysis, statistical tools and research methodology that facilitate transition to higher research programs like M. Phil and PhD.
3. Create and conduct an empirical research project in Economics (Primary and Secondary data based research)

ECO-404 (iii) REGIONAL ECONOMICS AND PUNJAB ECONOMY

Outcomes

1. Students evaluate the performance of agriculture
2. Students identify the implications of land system and land reforms and Agriculture finance
3. Students recognize various problems related to capital formation in agriculture.
4. Students critically evaluate food security and public distribution system in India

ECO-405(i): MONEY AND BANKING

Outcomes

1. Able to understand the need for banking sector in the economy and different explanations for it
2. Understand the International Monetary system in the economy and need for it.
3. Analyze the problem posed by excess money supply and how is it managed efficiently with the help of Monetary Policy.

ECO-405 (ii): THEORY OF STATISTICS

Outcomes

1. To apply mathematical tools for optimization and taking economic decisions and
2. To use differential and difference equations in illustrating dynamic stability and equilibrium and finally
3. To apply various technique in economic decision making.

ECO-405 (iii): MATHMATICAL ECONOMICS

Outcomes

1. To improve the basic mathematical skills of the students by familiarizing them with Set Theory and vectors for economic decision-making.
2. To Acquire applied knowledge of Matrices and determinants.
3. To evaluate economic theories by using differential and integral calculus.
4. To apply mathematical tools for optimization and taking economic decisions and
5. To use differential and difference equations in illustrating dynamic stability and equilibrium and finally
6. To apply the linear Programming technique in economic decision making.

ECO-405 (IV): ECONOMETRICS

Outcomes

1. This course would make students familiar with the concepts and application of limited dependent variable models.

2. It would also equip students to analyze real life data with the help of econometric tools using software and interpret the results.
3. This would explain the advanced topics like vector auto regression, co integration and vector error correction, simultaneous equation system, instrumental variable and two stage least square associated with time series and panel data regressions and how to solve them.
4. Moreover, this course would enormously help the students to enhance their analytical power along with developing the other cognitive skills.

PG DEPARTMENT OF COMMERCE AND MANAGEMENT
Session 2023-24
Post Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes.
Program: Master of Commerce
Programme Outcome

1. To acquaint a student with conventional as well as contemporary areas in the discipline of Commerce.
2. To enable a student well versed in national as well as international trends.
3. To enable the students for conducting business, accounting and auditing practices, role of regulatory bodies in corporate and financial sectors nature of various financial instruments.
4. To provide in-depth understanding of all core areas specifically Advanced Accounting, International Accounting, Management, Security Market Operations and Business Environment, Research Methodology and Tax planning.

Programme Specific Outcome
After the completion of the M.Com. Course, a student is able

1. For pursuing research in their chosen areas.
2. For teaching in Schools and Colleges after qualifying requisite tests.
3. For working as data analyst.
4. To work as investment consultants after a brief internship in suitable organizations absorbed in Banking and Insurance sector as executives

Course outcomes
Semester I
MC 101 Management Concepts & Organsational Behavior
The objective of this paper is to familiarize the students with the management concepts and techniques in business organizations.

MC 102 Accounting for Managerial Decisions
To imbibe the student with fundamental understanding of managerial accounting and how it assists an organization's management team in the overall management process.

MC 103 Business Economics
The main objective of this paper is to understand the basic economic principles essential for making business decisions in today's global economy.

MC 104 E- Commerce
The main objective of this paper is to acquaint the students with a fundamental understanding of the environment and strategies of e-commerce in the recent economy.

MC 105 (i) Financial Management
The main aim of this paper is to equip participants with requisite financial skills required for the solution of managerial problems.

MC 105 (ii) International Accounting
The main objective of this paper is to provide important information that can be used to make informed decisions.

Semester II

MC 201 Advanced Accounting

The main objective of this paper is to improve the competency of the students in context with the recent developments in accounts.

MC 202 Business Environment

To study the Business Environment that can provide all the information which is needed for taking good business decisions and scan businesses through Business Environment.

MC 203 Research Methodology & Statistical Techniques

The general objective of this paper is to introduce students to methods of research to introduce students to many of the technical aspects of how to do empirical research using some of the main data collection and analysis techniques.

MC 204*Seminar (Based upon current issues relating to Commerce)

To enhance student's knowledge by exploring various current issues related to business environment and also to enhance their presentation skills on respective theme.

MC 205 (i) Financial Institutions and Markets

To analyze the role of a financial system in the development of an economy by understanding various constituents of a country's financial system and debate on whether and how each of these constituents should work together to have the right influence on the economy.

MC 205 (ii) Management Information and Control System

The main objective of this paper is to make the students understand the MIS to enhance the efficiency and effectiveness of the decision-making process.

Semester III

MC 301 Contemporary Auditing

The objective of this course is to equip students with knowledge and understanding of the audit process, procedure of auditing and role played by an auditor and the standards followed in audit process.

MC 302 Corporate Legal Framework

The objective of this course is to impart expert knowledge, acquaintance and familiarity with the latest provisions of Companies Act and to have a good understanding of the important business legislations along with the relevant case laws.

MC 303 Direct Tax Laws

The objective of this course is to impart expert knowledge, aquaintance and familiarity with computation of income as per the latest provisions of Income-tax Act, 1961 and the relevant Rules.

MC 304 Marketing Management

The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing and to develop their skills so as to have deeper insight into the subject and to manage marketing operations of a business.

MC 305 Workshop on Data Analytics

The objective of this course is to provide practical knowledge about the basic and advanced research techniques by using the SPSS software.

MC 306 (i) Management of Financial Services

This course aims at acquainting the students with the developments in the areas of financial services and developing their skills to manage financial services. It will give an insight into the strategic, regulatory, operating and managerial issues concerning various financial services.

MC 306 (ii) Project Management

The course is aimed at developing the understanding of project activities and relevant skills and to enhance the application of planning, scheduling, monitoring and control of multiple projects.

Semester IV

MC 401 Human Resource Management

This course provides the coverage of concept of HRM, Human resources planning and procurement, human resource development and compensational and rewards system with the main objective to provide the student the knowledge about human resources, their significance and managing them in organizations.

MC 402 Fundamentals of Investment

This course seeks to acquaint students with the theoretical and practical aspects of investment analysis for security selection and portfolio management purposes.

MC 403 Banking and Insurance Services

This course aims at acquainting the participants with the operations, functions and management of banking and insurance sector. It will enable the students to know more about emerging trends in banking and insurance sector.

MC 404 Corporate Tax Planning

This course focuses on Tax planning relating to various managerial decisions for reducing the tax burden, allocation of investments, and maximize the company wealth. It helps in understanding the impudence of tax planning with various managerial decisions.

MC 405 Project Report

By preparing the project report the students will be able to think independently, analytically through the process of research and inquiry while making effective decisions in global environment

MC 406 (i) International Finance

The course aims at familiarizing the students with the concepts, functions and practices of international finance and to enable them get global perspective on issues related to business. It further analyses the nature and functioning of foreign exchange markets, determination of exchange rates

MC 406 (ii) Corporate Governance

The objective of the paper is to enable the student to understand the concept of corporate governance and to give information about the corporate governance reforming committee reports in India.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF GURMAT SANGEET AND MUSIC VOCAL

SESSION: 2023-2024

Post Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: MASTER OF ARTS (MUSIC VOCAL)

PROGRAM CODE: MAMUS -101

Program Outcomes

After completing undergraduate program in Music Vocal, a student will be able to: - PO

PO 1 Have further study of music.

PO 2. Will have the eligibility to understand the classical Raag gayan system.

PO 3. The students will be able to learn the shastriya Sangeet in future.

PO 4. The study will complete the basic need and students can make their future in this field.

PO 5. The students will be able to learn about the technical and scientific terms and scales of music and essential aspects of music like voice culture.

PO 6. The students will have the enrichment of Raag elements and to define the notation system.

Program Educational Objectives (PEO)

PEO 1. To make the students well known about the development of Indian music in ancient to modern period and also about the proper study of gharanas.

PEO 2. The students will be able to know about the eminent music scholars and musicians.

PEO 3. The students will be able know about the various shellies of Hindustani music and study about the important Granths of Indian music.

PEO 4. The students will have the stage performance of various Raags in different Gayan shellies like Khayal, Dhrupad, Dhamar etc.

PEO 5. The students will be able to learn about the comparative study of Hindustani and Karnataka styles of music. 4

Program Specific Outcomes (PSO)

PSO 1. To make the ability of students to study the gharana tradition in Punjab and to know about the eminent musicians who are the Indian classical music legends.

PSO 2. T performance in Raags in khayal Gayaki and dhrupad will enhance the quality of the students.

PSO 3. To enable the Students will be to make their future in various Musical fields.

PSO 4. To equip the students about the relative study of Music with other fields.

PSO 5. To make the students to perform with their creativity in Music.

PSO 6. To increase the Confidence level in Performing Art in Music.

PSO 7. To impart the quality of Listening the Best music forms.

PSO 8. To make the ability of various forms in Classical Music.

Paper Code-MAMUS-101

Paper I: Scientific & Acoustical Study of Hindustani Music.

Course objectives:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music. Further the students will also know about the different raags and taals, and how instruments are used.

Course Learning Outcomes:

- The students will be able to learn about the technical and scientific terms and scales of music and essential aspects of music like voice culture.
- The students will have the enrichment of Raag elements and to define the notation system.
- The students will be able to study the different terms of practical music like avaroh-avaroh, kan, murki, etc.

Paper Code-MAMUS-102

Paper-II: HISTORY OF INDIAN MUSIC

Course objectives:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music. Further the students will also know about the different rags and taals, and how instruments are used.

Course Learning Outcomes:

- To make the students well known about the development of Indian music in ancient to modern period and also about the proper study of gharanas.
- The students will be able to know about the eminent music scholars and musicians.
- To give the ability to understand the importance of Shri Guru Granth sahib in Indian music and kirtan chownki parampara in Gurmat Sangeet .

- The students will be able know about the various shellies of Hindustani music and study about the important granths of Indian music

Paper Code-MAMUS-103 Paper-III: STAGE PERFORMANCE (MUSIC VOCAL)

Course objectives:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music. Further the students will also know about the different rags and taals, and how instruments are used.

Course Learning Outcomes:

- The students will have the stage performance of various Raags in different Gayan shellies like Khayal, Dhrupad, Dhamar etc.
- The ability to sing folk song from Punjab region with harmonium.
- The ability to give the information of talas on hands as well as on tabla.

Paper Code- MAMUS-104 Paper-IV: (VIVA-VOCE)

Course objectives:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music. Further the students will also know about the different rags and taals, and how instruments are used.

Course Learning Outcomes:

- The students will have the viva-voce with prescribed terms of Indian music.
- The critical study of Raags will be taken in viva-voce.
- The students will have the ability to define the different Gayan shellies.

M.A. 1st year (Music Vocal) Semester - II

Program Objectives (PO)

- To impart intense knowledge of scientific and acoustic aspects of Hindustani Music.
- To enrich the students with knowledge about development of Indian music from ancient period to modern period along with the treatises, Gharanas various musical forms and prominent musicians.
- To enable students to become efficient in the practical field of Indian Music Covering various singing styles i.e. Classical, Semi-Classical, Folk, Light, Religious Music.

- To introduce the students to analytical and comparative study of the Raags. Thus enabling them to adopt Music as their future Profession, both in teaching and performance field.

Program Specific Outcome (PSO)

After completing the course, the student will be able to:

- Establish a solid foundation in various theories of music.
- To have further research in music.
- To understand the various concepts of music like scientific and historical etc.
- have the continuity in further disciplinary manner in various fields of music.
- The study will complete the basic need and students can make their in future in this field.

Paper Code-MAMUS-201

Paper I: Scientific & Acoustical Study of Hindustani Music:I

Course objectives:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music. Further the students will also know about the different rags and taals, and how instruments are used.

Course Learning Outcomes:

- The detailed study of swaras,gramas and technical terms of music will be defined by students.
- The students will be able to learn about the comparative study of Hindustani and Karnataka styles of music.
- The student will be introduced to the cycle in the context of swara-samvada in Indian music.
- To give the understanding about melody and harmony,merits and demerits of gayak.

Paper Code-MAMUS-202

Paper – II: History of Indian Music:II

Course objectives:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music. Further the students will also know about the different rags and taals, and how instruments are used.

Course Learning Outcomes:

- The students will be introduced to the development of Indian music in different periods and contribution of Sikh Gurus.
- The historical development of different gayan shellies and Khayal Gharanas will be introduced to the students.
- The students will be able to study the Gharana tradition in Punjab and to know about the eminent musicians who are the Indian classical music legends.

Paper Code-MAMUS-203 Paper-III: STAGE PERFORMANCE (MUSIC VOCAL)

Course objectives:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music. Further the students will also know about the different rags and taals, and how instruments are used.

Course Learning Outcomes:

- The performance in Raags in khayal gayaki and dhrupad will enhance the quality of the students.
- The students will be able to sing the bhajan or Shabad in classical style of music.
- The students will have the ability to demonstrate the talas on hands and on table.

Paper Code-MAMUS-204 Paper- IV (Viva-Voce)

Course objectives:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music. Further the students will also know about the different rags and taals, and how instruments are used.

Course Learning Outcomes:

- The students will have the viva-voce with prescribed terms of Indian music.
- The critical study of Raags will be taken in viva-voce.
- The students will have the ability to define the different Gayan shellies.

P.G. Department of Computer Science

SESSION: 2023-2024

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and CourseOutcomes (Cos) of the Programmes.

Program Name: BCA

Programme Outcomes

Programme outcomes:

At the end of the three year BCA Programme the students will be able to:

1. Understand, analyse and develop computer Programmes in the areas related to algorithm, web design and networking for efficient design of computer based system.
2. Work in the IT sector as system engineer, software tester, junior Programmer, web developer, system administrator, software developer etc.
3. Apply standard software engineering practices and strategies in software project development using open source Programming environment to deliver a quality of product for business success.

Programme Specific outcomes

1. To provide thorough understanding of nature, scope and application of computer and computer languages.
2. To work effectively both as individual and a team leader on multidisciplinary projects.
3. Possess strong foundation for their higher studies.
4. Improves communication skills so that they can effectively present technical information in oral and written reports.
5. To work in the IT sector, public sector undertakings and Government organizations

Course Outcomes

Semester I

BCA-113 Fundamentals of Information Technology

1. Understanding the fundamentals concept of hardware, software of Computers and how it works.

2. Understand the basic concepts and terminology of information technology.
3. Have a basic understanding of personal computers and their operations.
4. Be able to identify issues related to information security.

BCA-114 Web designing using HTML

1. Recognize the components of an HTML file and create such a file
2. Understand the principles of creating an effective web page
3. Link to local files and Web pages from their Web pages.
4. Become familiar with graphic design principles (Add graphics and sound to their Web pages using HTML).
5. Learn the language of the web: HTML and CSS.

BCA-115 (E1) E-Commerce

1. Understand concept of Ecommerce and its types.
2. Be familiarized with technologies for Ecommerce.
3. Understand different types of Online Payment systems.
4. Understand Selling and marketing on web.
5. Be familiarized with concept of E-business and E-business Models.
6. Understand various E-business Strategies.

Semester II

BCA-123 Programming Fundamentals using C

1. An understanding of basic concepts of computer programming and developer tools.
2. An introduction to the syntax and semantics of the ‘C’ language as well as data types offered by the language.
3. An introduction to write programs using standard language infrastructure regardless of the hardware or software platform.
4. Write, compile and debug programs in C language and use different data types for writing the programs.
5. Understand the dynamic behavior of memory by the use of pointers.
6. Demonstrate the use of algorithms and flowcharts to plan the solution of a computing problem.

BCA-124 Operating System

1. To understand the main components of an OS & their functions.
2. To understand concepts of CPU scheduling and Disk scheduling.
3. To understand the concepts and implementation Memory management policies and virtual memory.
4. To understand the working of an OS as a resource management, file system management, process management, memory management, Device management.
5. To understand the concept of deadlocks.

BCA-125 (E1) Computer System Architecture

1. Understand the basics concept of data representation and digital logic circuits used in the computer system.
2. Understand the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design.
3. Study various data transfer techniques in digital computer.
4. Categorize memory organization and explain the function of each element of a memory hierarchy.

Semester III

BCA-201 Object Oriented Programming using C++

On completion of this course, the students will be able to:

1. Write, compile and debug programs in C++ language.
2. Use different data types, operators and console I/O function in a computer program.
3. Design programs involving decision control statements, loop control statements and case control structures.
4. Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
5. Comprehend the concepts of structures and classes: declaration, initialization and implementation.
6. Apply basics of object oriented programming, polymorphism and inheritance.

BCA-202 Data Structure

1. Understand and remember algorithms and its analysis procedure.
2. Demonstrate the use of data structures like linked lists, stacks and queues.
3. To design and implement various data structure algorithms.
4. Apply the knowledge of data structures to a given problem.
5. Illustrate searching, sorting and hashing techniques.
6. Compute the complexity of various algorithms.

BCA-203 Relational database Management system with oracle

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

1. Master the basic concepts and appreciate the applications of database systems.
2. Master the basics of SQL and construct queries using SQL.
3. Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.
4. Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
5. Be familiar with basic database storage structures and access techniques: file and page organizations, indexing and hashing.
6. Master the basics of query evaluation techniques and query optimization.
7. Be familiar with the basic issues of transaction processing and concurrency control.

BCA-204 Software Engineering

1. Basic knowledge and understanding of the analysis and design of complex systems.
2. Ability to apply software engineering principles and techniques.
3. Ability to develop, maintain and evaluate large-scale software systems.
4. To produce efficient, reliable, robust and cost-effective software solutions.
5. Ability to perform independent research and analysis.
6. To manage time, processes and resources effectively by prioritising competing demands to achieve personal and team goals Identify and analyzes the common threats in each domain.

Semester IV

BCA-211 Computer Networks

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

1. Describe the general principles of data communication.
2. Describe how computer networks are organized with the concept of layered approach.
3. Implement a simple LAN with hubs, bridges and switches.
4. Describe how packets in the Internet are delivered.
5. Analyse the contents in a given data link layer packet, based on the layer concept.
6. Describe how routing protocols work.
7. To study various layers of OSI/TCP IP model.

BCA-212 Programming using Java

1. Understand basic concepts of the Java programming language.
2. Knowledge of object-oriented paradigm in the Java programming language.
3. Understand basics of multithreaded programming and exception handling.

BCA-213 System Software

1. Distinguish between Operating Systems software and Application Systems software.
2. Describe commonly used operating systems.
3. Identify the primary functions of an Operating System.
4. Able to understand the concepts and working of assemblers, compilers, macro processors, loader and linkage editors.

BCA-214 Adobe Photoshop

1. Understand the basics of adobe Photoshop.
2. Able to use o various selection tools.
3. Able to work with layers, channels and filters of adobe Photoshop.
4. Able to create images for Web.

BCA-215(E1) Digital Electronics

1. Convert different type of codes and number systems which are used in digital communication and computer systems.
2. Employ the codes and number systems converting circuits and Compare different types

of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.

3. Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.
4. Able to design multiplexers, demultiplexers, encoders, decoders and Flip Flops.

Semester V

BCA-301 Web Designing using ASP.NET

At the end of the course the participant will

1. Create a Web form with server controls.
2. Separate page code from content by using code-behind pages, page controls, and components.
3. Display dynamic data from a data source by using Microsoft ADO.NET and data binding

BCA-302 Computer Graphics

Outcomes:

1. To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.
2. To learn the basic principles of 3- dimensional computer graphics.
3. Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.
4. Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.
5. To be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.

BCA-303 Linux Administration

Outcomes:

1. Introduces the student to the Linux Operating system with particular emphasis on command line tools, utilities and shell scripting.

2. The student will learn and apply the various commands and utilities related to file system management, process management, program development and data processing.
3. The student will learn about shell concepts and become proficient in the use of shell features such as command line editing and learn and apply Linux concepts such as pipes and filters.
4. The student will apply the aforementioned utilities and concepts in the writing of shell scripts.
5. The students will learn to configure X windows, system Administration and networking skills using linux.

BCA-304(E2) Management Information System

1. Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
2. Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.
3. Effectively communicate strategic alternatives to facilitate decision making.

Semester VI

BCA-311 Web Development using PHP and MYSQL

After completion of the course the student should able to:

1. Able to write programs for simple web based applications using PHP Code.
2. Able to understand the concepts of functions, arrays, string and class objects.
3. Develop programs for creating database and perform various operations.
4. Understand basics of server and client side scripting

BCA-312 Artificial Intelligence

1. To present an overview of artificial intelligence (AI) principles and approaches.
2. Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning. Students will implement a small AI system in a team environment.
3. Understand the concepts of knowledge based system, expert system and different types of learning.

BCA-313(E1) Programming Using Python

1. Install and run the Python interpreter
2. Create and execute Python programs
3. Understand the concepts of List ,Tuple, Dictionary, set and functions.
4. To acquire programming skills in core Python.
5. To acquire Object Oriented Skills in Python
6. To understand the various String and formatting methods.
7. Able to work with files.
8. To provide knowledge and experiences to students that serve as a foundation for continued learning of presented areas

B.Sc. (H) AI & DS

Programme outcomes:

At the end of the three year B.Sc.(H) AI & DS Programme the students will be able to:

1. Exhibit good domain knowledge and completes the assigned responsibilities effectively and efficiently in par with the expected quality standards.
2. Apply analytical and critical thinking to identify, formulate, analyse, and solve complex problems in order to reach authenticated conclusions.
3. Establish the ability to listen, read, proficiently communicate and articulate complex ideas with respect to the needs and abilities of diverse audiences.
4. Deliver innovative ideas to instigate new business ventures and possess the qualities of a good entrepreneur.
5. Acquire the qualities of a good leader and engage in efficient decision making. Graduates will be able to undertake any responsibility as an individual/member of multidisciplinary teams and have an understanding of team.

Programme Specific Outcomes:

1. Enable graduates to design and harness the power of AI in broad application fields from vision to advanced autonomous systems.
2. Explain and critically assess a range of artificial intelligence techniques used in data analytics and in other related areas.

3. Examine large amounts of data to uncover hidden patterns, correlations, insights, and help organizations harness their data to identify new opportunities.
4. Critically evaluate emerging data analysis technologies and assess how it can be applied to different types and amounts of data.
5. Obtain expertise to turn actionable insights and cutting-edge technology into innovative products to solve real world problems.
6. Effectively communicate findings in terms of reports and presentations.
7. Inculcate independent research ability that addresses fundamental problems.

Course Outcomes

Semester I

BSCHAI-113 Computer Fundamentals

Students will learn:

1. Understanding the fundamentals concept of hardware, software of Computers and how it works.
2. Understand the basic concepts and terminology of information technology.
3. Have a basic understanding of personal computers and their operations.
4. Be able to identify issues related to information security.

BSCHAI-114 Problem Solving and Programming in C

1. An understanding of basic concepts of computer programming and developer tools.
2. An introduction to the syntax and semantics of the ‘C’ language as well as data types offered by the language.
3. An introduction to write programs using standard language infrastructure regardless of the hardware or software platform.
4. Write, compile and debug programs in C language and use different data types for writing the programs.
5. Understand the dynamic behavior of memory by the use of pointers.
6. Demonstrate the use of algorithms and flowcharts to plan the solution of a computing problem.
7. To be able to work with Files.

BSCHAI-115 Introduction to Artificial Intelligence

1. To present an overview of artificial intelligence (AI) principles and approaches.
2. Develop a basic understanding of the building blocks of AI as presented in terms of intelligent agents: Search, Knowledge representation, inference, logic, and learning. Students will implement a small AI system in a team environment.
3. Understand the concepts of knowledge based system, expert system and different types of learning.

Semester II

BSCHAI-121 Object Oriented Programming Concepts using C++

C++ is an Object Oriented Programming language. It is fast, portable and available in all platforms. This course will help the students to:

1. Understand the basic concepts of object Oriented Programming
2. Develop the programs using Classes and Objects
3. Understand the concept of reusability using Inheritance
4. Learn how to implement Polymorphism using Operator Overloading and Function Overloading.

BSCHAI-122 Data Structures

This course will help the students to:

1. Understand and remember algorithms and its analysis procedure.
2. Demonstrate the use of data structures like linked lists, stacks and queues.
3. To design and implement various data structure algorithms.
4. Apply the knowledge of data structures to a given problem.
5. Illustrate searching, sorting and hashing techniques.
6. Compute the complexity of various algorithms.

Semester III

BSCHAI-132 Problem Solving and Programming in Python

1. Install and run the Python interpreter
2. Create and execute Python programs

3. Understand the concepts of List ,Tuple, Dictionary, set and functions.
4. To acquire programming skills in core Python.
5. To acquire Object Oriented Skills in Python
6. To understand the various String and formatting methods.
7. Able to work with files.
8. To provide knowledge and experiences to students that serve as a foundation for continued learning of presented areas.

BSCHAI-133 Fundamentals of DBMS

1. To make student understand the role of a database management system in an organization
2. Understand basic database concepts, including the structure and operation of the relational data model
3. Construct simple database queries using Structured Query Language (SQL)
4. Understand and successfully apply logical database design principles, including E-R diagrams and database normalization
5. Understand the role of the database administrator.
6. Understand the concept of transaction & concurrency control and Database security.

BSCHAI-134 Introduction to Data Science

1. Understand concepts of Data Science its issues and challenges.
2. Able to understand data exploration concepts, feature selection and extraction.
3. To learn the representation of data in various forms.
4. Learn various data presentation and visualization techniques.

Semester IV

BSCHAI-142 Data Analysis using Python

1. To install and use Jupyter notebooks.
2. To demonstrate the basic and advanced concepts of Numpy and its various functions.
3. To introduce Pandas Series and Data Frames.
4. To introduce data manipulation and cleaning techniques using Pandas.
5. To demonstrate the loading of various formats and various data manipulation operations like data wrangling, group operations etc.

6. To introduce data visualization and plotting tools.

BSCHAI-143 Web Technology

1. Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
2. Learn the language of the web: HTML and CSS.
3. Learn techniques of responsive web design, layouts & style sheets.
4. Learn basics of Bootstrap frame work.

BSCHAI-144(i) Software Engineering

1. Basic knowledge and understanding of the analysis and design of complex systems.
2. Ability to apply software engineering principles and techniques.
3. Ability to develop, maintain and evaluate large-scale software systems.
4. To produce efficient, reliable, robust and cost-effective software solutions.
5. Ability to perform independent research and analysis.
6. To manage time, processes and resources effectively by prioritising competing demands to achieve personal and team goals Identify and analyzes the common threats in each domain.
7. Ability to understand and meet ethical standards and legal responsibilities.

Semester V

BSCHAI- 151 R programming & Machine learning

1. Learn the basics of R programming.
2. Student will become familiar with various machine learning techniques.
3. Able to learn about Classification techniques.
4. Able To learn about neural networks in machine learning.
5. Learn to combine multiple classifiers to get better result.

BSCHAI- 152 Data Warehousing & Mining

1. Understand the functionality of the various data mining and data warehousing component.
2. Understand the strengths and limitations of various data mining and data warehousing models and analyzing techniques of various data.

3. Able to Describe different methodologies used in data mining and data ware housing.
4. Able to Compare different approaches of data ware housing and data mining with various technologies.

BSCHAI- 153 Operating System

1. To understand the main components of an OS & their functions.
2. To understand concepts of CPU scheduling and Disk scheduling.
3. To understand the concepts and implementation Memory management policies and virtual memory.
4. To understand the working of an OS as a resource management, file system management, process management, memory management, Device management.
5. To understand the concept of deadlocks

BSCHAI- 154 Computer Networks

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

1. Describe the general principles of data communication.
2. Describe how computer networks are organized with the concept of layered approach.
3. Implement a simple LAN with hubs, bridges and switches.
4. Describe how packets in the Internet are delivered.
5. Analyse the contents in a given data link layer packet, based on the layer concept.
6. Describe how routing protocols work.
7. To study various layers of OSI/TCP IP model

BSCHAI- 156 Workshops in Linux

1. Introduces the student to the Linux Operating system with particular emphasis on command line tools, utilities and shell scripting.
2. The student will learn and apply the various commands and utilities related to file system management, process management, program development and data processing.
3. The student will learn about shell concepts and become proficient in the use of shell features such as command line editing and learn and apply Linux concepts such as pipes and filters.

4. The student will apply the aforementioned utilities and concepts in the writing of shell scripts.
5. The students will learn to configure X windows, system Administration and networking skills using linux.

Semester VI

BSCHAI- 161 Big data Analysis & Visualization

1. To provide an overview of an exciting growing field of big data analytics.
2. To introduce the tools required to manage and analyze big data like Hadoop, MapReduce.
3. To teach the fundamental techniques and principles in achieving big data analytics with scalability and streaming capability.
4. To enable students to have skills that will help them to solve complex real-world problems in for decision support.

BSCHAI – 162: Web Development using PHP and MYSQL

After completion of the course the student should able to:

1. Able to write programs for simple web based applications using PHP Code.
2. Able to understand the concepts of functions, arrays, string and class objects.
3. Develop programs for creating database and perform various operations.
4. Understand basics of server and client side scripting.

BSCHAI – 163: Cyber Security

Course Objectives:

1. To make students familiar with the fundamental concepts of computer ethics.
2. To know the linkage between computer, professional, philosophical ethics and decision making.
3. To give emphasis on how cyber security operations are carried out.
4. To introduce the linkage between technology, law and ethics and IT Act.

B.Voc. (SD)

Programme Outcomes:

Programme has been designed to prepare graduate for attaining the following outcomes:

1. The B.Voc. Programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles and their NOSs along with broad based general education.
2. This would enable the graduates completing B.Voc. to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge. Improve their computer literacy, their basic understanding of operative systems and a working. Knowledge of software commonly used in academic and professional environments.

Programme Specific outcomes:

1. Understand analyze and develop computer Programmes in the areas related to web design, mobile application design.
2. Apply standard software engineering process and strategies in software project development using open source Programmeming environment to deliver a quality product for business success.
3. Acquaintance with latest trends in software development and thereby innovate new ideas in the area of software development.
4. Provide industry exposure through 6 month industrial training.
5. Able to assist in performing software construction and testing entry level tasks in the IT services industry.
6. Able to develop knowledge, skills and competence in software development sector.
7. Able to contribute to design of software products and applications.
8. Able to provide data/ information in standard formats.

Course Outcomes

Semester I

BVSD-111 Fundamentals of Computer and Software Development

1. Understanding the fundamentals concept of hardware, software of Computers and how it works.
2. Understanding the concept of Operating system.
3. Identify, understand and apply different number systems and codes.

4. Understanding the basics of Software Development, Quality attributes and associated problems with software and software development.

BVSD-112 Programming using C

1. An understanding of basic concepts of computer programming and developer tools.
2. An introduction to the syntax and semantics of the 'C' language as well as data types offered by the language.
3. An introduction to write programs using standard language infrastructure regardless of the hardware or software platform.
4. Write, compile and debug programs in C language and use different data types for writing the programs.
5. Understand the dynamic behavior of memory by the use of pointers.
6. Demonstrate the use of algorithms and flowcharts to plan the solution of a computing problem.

BVSD-113 Web designing using HTML

1. Recognize the components of an HTML file and create such a file
2. Understand the principles of creating an effective web page
3. Link to local files and Web pages from their Web pages.
4. Become familiar with graphic design principles.
5. Learn basics of HTML,DHTML and CSS.

Semester II

BVSD-121 Object Oriented Programming using C++

1. An understanding the concept of object oriented programming.
2. An understanding of the concepts of data hiding, data abstraction, polymorphism inheritance and exception handling.
3. Ability to understand the generic principles of object oriented programming using "C++".
4. An understanding the use of templates in "C++".
5. An ability to plan, design, execute and document sophisticated object oriented programs to handle different computing problems.
6. Illustrate stream I/O and exception handling.

BVSD-122 Data structure

1. Understand and remember algorithms and its analysis procedure.
2. Demonstrate the use of data structures like linked lists, stacks, queues and trees.
3. To design and implement various data structure algorithms.
4. Apply the knowledge of data structures to a given problem.
5. Illustrate searching and sorting techniques.
6. Compute the complexity of various algorithms.

Semester III

BVSD-211 Programming using Java

On successful completion of this course the students are:

1. Able to acquire knowledge of Programming logic concepts,
2. Able to create wide range of Applications and Applets using Java.
3. Able to understands the fundamentals of object oriented programming in Java,
4. Understand and implement the concepts event handling, exception handling and Components like JApplet,Jtextbox etc.
5. Able to Perform Connectivity using JDBC.

BVSD-212 Fundamentals of DBMS

1. To make student understand the role of a database management system in an organization.
2. Understand basic database concepts, including the structure and operation of the relational data model
3. Construct simple database queries using Structured Query Language (SQL)
4. Understand and successfully apply logical database design principles, including E-R diagrams and database normalization
5. Understand the role of the database administrator.

BVSD-213 Operating System

1. To understand the main components of an OS & their functions.
2. To understand concepts of CPU scheduling and Disk scheduling.

3. To understand the concepts and implementation Memory management policies and virtual memory.
4. To understand the working of an OS as a resource management, file system management, process management, memory management, Device management.
5. To understand the concept of deadlocks.

BVSD-214 Management Information System

1. Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.
2. Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.
3. Effectively communicate strategic alternatives to facilitate decision making.

BVSD-217 Workshop on Adobe Photoshop

1. Understand the basics of adobe Photoshop.
2. Able to use o various selection tools.
3. Able to work with layers, channels and filters of adobe Photoshop.
4. Able to create images for Web.

Semester IV

BVSD-221 Web Development using PHP and MYSQL

After completion of the course the student should able to:

1. Able to write programs for simple web based applications using PHP Code.
2. Able to understand the concepts of functions, arrays, string and class objects.
3. Develop programs for creating database and perform various operations.
4. Understand basics of server and client side scripting.

BVSD-222 Content Management System

After completion of the course the student should able to:

1. Understand what a Content Management System is and how it differs from traditional, flat websites
2. Select the appropriate server environment and be able to install Joomla's files and database

3. Successfully organize and present content in Joomla
4. Select and integrate extra Joomla features from various sources, understanding the difference between different types of extension.
5. Modify the appearance and layout of Joomla websites.
6. Understand how to protect and backup CMS websites.

BVSD-223 Computer Networks

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

1. Describe the general principles of data communication.
2. Describe how computer networks are organized with the concept of layered approach.
3. Implement a simple LAN with hubs, bridges and switches.
4. Describe how packets in the Internet are delivered.
5. Analyse the contents in a given data link layer packet, based on the layer concept.
6. Describe how routing protocols work.
7. To study various layers of OSI/TCP IP model.

BVSD-224 Relational database Management System

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

1. Master the basic concepts and appreciate the applications of database systems.
2. Master the basics of SQL and construct queries using SQL.
3. Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.
4. Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
5. Be familiar with basic database storage structures and access techniques: file and page organizations, indexing and hashing.
6. Master the basics of query evaluation techniques and query optimization.
7. Be familiar with the basic issues of transaction processing and concurrency control

Semester V

BVSD-311 Programming Using Python

1. Install and run the Python interpreter
2. Create and execute Python programs
3. Understand the concepts of List, Tuple, Dictionary, set and functions.
4. To acquire programming skills in core Python.
5. To acquire Object Oriented Skills in Python
6. To understand the various String and formatting methods.
7. Able to work with files.
8. To provide knowledge and experiences to students that serve as a foundation for continued learning of presented areas

BVSD-312 Web Development using ASP.Net

1. Develop dynamic web applications, create and consume web services
2. Use appropriate data sources and data bindings in ASP.NET web applications.
3. Research and discover information about current topics, illustrate in an example, and present to the class.

BVSD-313 Software Engineering & Testing

1. To introduce the students with basic principles of Software Engineering.
2. To learn the Software Engineering concepts, methodologies and best practices.
3. To understand the different phases in Software Engineering Process such as SRS, Software Design and Software Coding.
4. To discuss various software testing issues and solutions in software unit test, integration and system testing.
5. To expose the advanced software testing topics, such as object-oriented software testing methods.

BVSD-317 Workshop on Corel Draw

On the completion of course, the student will have sufficed knowledge about the entire software. He will be well versed with drawing grids, segments, using rulers, coloring, manipulating effects, moderating shapes etc

Semester VI

Students acquire skills in 6-month Industrial Training

Diploma in Computer Hardware and Networking

Programme outcomes:

The one year course aims to develop personals, capable of taking responsibilities such as installation, repair and maintenance, networking, security administration and operating computer units.

Programme Specific Outcomes:

1. The course provides learners with a cutting edge in the domain and enables them to construct a machine from scratch.
2. The course builds a strong foundation in Computer Hardware Maintenance & also empowers the students with the knowledge of the most widely used networking platforms.

Course outcomes

DCHN-1 Fundamentals of Information Technology and MS-Office

1. Define computer information technology vocabulary, concepts, and skills.
2. Use the computer, communication skills, and related information technology to achieve business objectives.
3. Demonstrate competence in communicating information effectively both in writing and orally.
4. Recognize the social and ethical issues which face users of computer information technology and behave appropriately
5. Define and solve problems individually and with groups, using a variety of resources and methods, including technology and communicate findings effectively in writing and in speech.

DCHN-2 Network Essentials

1. Independently understand basic computer network technology.
2. Understand and explain Data Communications System and its components.
3. Identify the different types of network topologies and protocols.
4. Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
5. Identify the different types of network devices and their functions within a network
6. Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.

DCHN-4 PC Assembling and Troubleshooting

1. Students will know what are registers, various types of registers and interfacing various registers. Students will learn about the architecture of common bus system, Instruction Cycle, Interrupt Cycle.
2. Students will learn about I/O interface, DMA controller, modes of data transfer and various address modes.
3. Students will learn how to assemble a PC Work inside a microcomputer system with supervision.
4. Approach will be used to provide the student with a basic skill level to work on a computer with the lid off.
5. Recognition and solution of common hardware-software problems including the replacement or upgrading of components will be addressed

DCHN-5 Windows 2007 Server Administration

1. Demonstrate the knowledge of Systems Programming and Operating Systems
2. Formulate the Problem and develop the solution for same.
3. Compare and analyze the different implementation approach of system programming and operating system abstractions.
4. Interpret various OS functions used in Window 2007

Add on Certificate Course in Web Designing

Programme Outcomes:

The course has been designed to provide the basic knowledge for design of the web pages / sites.

Programme specific Outcomes:

1. Enable students to create, publish and manage websites.
2. Enable students to work with different website developing tools.
3. Enable students to create multimedia content of websites.
4. Enable students to apply proper layout and interactive website design.

Course Outcomes

CC-101 Web Designing Using HTML & DHTML

1. Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
2. Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
3. Understand how to plan and conduct user research related to web usability.
4. Learn the language of the web: HTML and CSS.
5. Learn techniques of responsive web design, including media queries.
6. Develop skills in digital imaging (Adobe Photoshop.)
7. Develop basic programming skills using Java script and j-Query.
8. Be able to embed social media content into web pages.

CC-201 Web development using PHP

1. Describe the architecture of client side and server side web applications
2. Identify the appropriate programming environment for developing dynamic client side and server side web applications.
3. Plan, develop, debug, and implement interactive clientside and serverside web applications.
4. Identify the tools needed to create dynamic client side and server side web applications.
5. Evaluate and validate web applications for conformance to the latest W3C mark-up standards.

6. Choose between server side and client side programming, depending on the task to be performed.

Value Added Course

Ms Office (Word, Power Point & Excel)

Programme Outcomes:

The course has been designed to provide the basic knowledge of Ms Office

(**Word, Power Point & Excel)**.

Programme specific Outcomes:

1. Utilize the functionality and productivity of Microsoft office.
2. Hands on practical knowledge.
3. Proficiency in creating professional documents and reports.
4. Explore slideshow presentation concepts.
5. Build spreadsheets to perform calculations, display data and conduct analysis.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF PHYSICS

SESSION: 2023-24

Under Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: B.Sc. (Non-Medical)

PROGRAMME CODE: BSC-NM

Programme Overview

Programme Code: BSC-NM

Duration: 3 Years

Bachelor of Science programme is designed to prepare students for pursuing higher education or working in industry by introducing advanced ideas and techniques that are applicable in a wide range of Physics, Chemistry and Mathematics, its learning and application while emphasizing the underlying concepts of Physics. Out of all these we provides in-depth understanding of principles and concept of Physics, proficiency in experimentation to understand the theoretical and experimental dimensions of Physics.

Programme Outcomes

1. The graduates will have knowledge of fundamental laws and principles in a variety of areas of Physics along with their applications.
2. The graduates will develop research skills which might include advanced laboratory techniques, numerical techniques, computer algebra, computer interfacing.
3. The graduates will become effective researcher who will be able to provide lucid summation of the scientific literature on a given topic of study.

Programme Specific Outcomes

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

1. Apply theoretical knowledge of principles and concepts of Physics to practical problems.
2. Use mathematical techniques and interpret mathematical models of physical behavior.
3. Demonstrate the ability to plan, undertake, and report on a programme of original work; including the planning and execution of experiments, the analysis and interpretation of experimental results.
4. Develop communication skills, both written and oral, for specialized and non-specialized audiences.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

SCHEME OF STUDIES

B.SC. NON-MEDICAL PART

I PROGRAMME CODE:

BSC-NM

SEMESTER I

Course Code	Course Opted	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
BSC(PHY)-103A	Core Course-IA	Mechanics	2	50	35	15
BSC(PHY)-103B	Core Course-IB	Electricity & Magnetism-I	2	50	35	15
BSC(PHY)-103P	Practical	Physics Practical	2	50	50	--
			Total Credits: 06	Total Marks: 150		

SEMESTER II

Course Code	Course Opted	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
BSC(PHY)-203A	Core Course-IA	Oscillations & Waves	2	50	35	15
BSC(PHY)-203B	Core Course-IB	Electricity & Magnetism-II	2	50	35	15
BSC(PHY)-203P	Practical	Physics Practical	2	50	50	--
			Total Credits: 06	Total Marks: 150		

Semester-I & II

BSC(PHY)-103A: MECHANICS

Course Objective: Students will develop their quantitative and mathematical skills needed to describe the co-ordinate system, central forces, rigid bodies, frame of references and relativity.

Course learning outcome:

After going through the course, the student should be able to;

- Understand laws of motion and their application to various dynamical situations, notion of inertial frames and concept of Galilean invariance. He / she will learn the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.
- Apply Kepler's law to describe the motion of planets and satellite in circular orbit, through the study of law of Gravitation.
- Describe how fictitious forces arise in a non-inertial frame, e.g., why a person sitting in a merry- go-round experiences an outward pull.
- Describe special relativistic effects and their effects on the mass and energy of a moving object, appreciate the nuances of Special Theory of Relativity (STR).

BSC(PHY)-103B: ELECTRICITY & MAGNETISM-I

Course Objective: This course continues building the foundation in electricity and magnetism and is intended for students to advanced studies in the physical sciences. Topics include vector calculus, electric fields, potential, capacitors.

Course learning outcome:

By the end of this course, you should be able to:

- Apply the tools of vector calculus, and demonstrate a working understanding of the divergence and curl of vector fields, as well as the divergence and curl integral theorems.
- Demonstrate a mastery of Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges.
- Demonstrate an understanding of the relation between electric field and potential, exploit the potential to solve a variety of problems, and relate it to the potential energy of a charge distribution.
- Demonstrate an understanding of the behavior of electric conductors.

BSC(PHY)-203A: OSCILLATIONS AND WAVES

Course Objective: Students will develop their quantitative and mathematical skills

needed to describe the oscillations in mechanical and electrical medium under various conditions, Electromagnetic waves and related Maxwell's equations.

Course learning outcome:

After going through the course, the student should be able to;

- Demonstrate the idea of Oscillations of mechanical and electrical oscillator.
- Understand oscillations in various conditions
- Understand electromagnetic waves and related Maxwell's equations
- Understand wave nature in various mediums.

BSC(PHY)-203B: ELECTRICITY & MAGNETISM-I

Objectives: At the end of reading the course, the student should be able to demonstrate an understanding of the concepts of Electricity and Magnetism which include the concept of magnetostatics, the magnetic properties of materials, Faraday's Laws and Maxwell equations

Learning Outcomes:

Having successfully completed this module, student will be able to demonstrate knowledge and understanding of:

- The Biot-Savart's law & its application, the Magnetic properties of Materials.
- The use of Faraday's Law of electromagnetic induction, Lenz's Law, self and mutual induction.
- Maxwell's equations and electromagnetic wave propagation.

SCHEME OF STUDIES
B.SC. NON-MEDICAL PART II
PROGRAMME CODE: BSC-NM
SEMESTER III

Course Code	Course Opted	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
BSC(PHY)-303A	Core Course-IA	Statistical physics	2	50	35	15
BSC(PHY)-303B	Core Course-IB	Quantum mechanics	2	50	35	15
BSC(PHY)-303P	Practical	Physics Practical	2	50	50	--
			Total Credits: 06	Total Marks: 150		

SEMESTER IV

Course Code	Course Opted	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
BSC(PHY)-403A	Core Course-IA	Thermodynamics	2	50	35	15
BSC(PHY)-403B	Core Course-IB	Optics & Lasers	2	50	35	15
BSC(PHY)-403P	Practical	Physics Practical	2	50	50	--
			Total Credits: 06	Total Marks: 150		

Semester-III & IV

BSC(PHY)-303A: STASTISTICAL PHYSICS

Course Objective: This course develops concepts of statistical mechanics, statistical interpretation of thermodynamics, the methods of statistical mechanics are used to develop the statistics for Bose- Einstein, Fermi-Dirac and photon gases, various laws related to radiation are discussed.

Course learning outcome:

This course develops concepts in statistical mechanics,

- statistical interpretation of thermodynamics, micro canonical, canonical and grant canonical ensembles;
- the methods of statistical mechanics are used to develop the statistics for Bose-Einstein, Fermi- Dirac and photon gases;
- selected topics from low temperature physics and electrical and thermal properties of matter are discussed.
- The concept of Black body radiation and various laws related to Black Body Radiation are also discussed.

BSC(PHY)-303B: QUANTUM MECHANICS

Course Objective: The objective of the course on Quantum Mechanics for the student of B.Sc. Non-Medical is to equip them with the knowledge of wave particle duality, Planck's quantum, fundamental of quantum relations, and related problems and applications.

Course learning outcome:

Students will have achieved the ability to:

- The basic laws of quantum and their relations etc.
- Interpretation of wave function and its properties
- Solve Schrodinger equation and related problems

BSC(PHY)-403A: THERMODYNAMICS

Course Objective: To give basic knowledge about the laws and potentials of thermodynamics and its applications in different physical conditions.

Course learning outcome:

After completion of the course, student will be able to understand:

- The Laws of thermodynamics, entropy, and Maxwell's thermodynamic relations etc.
- The basic of statistical mechanics, concept of microstate, macrostate and three kinds of statistics.
- The Transport Phenomena, law of equipartition of energy and its applications.

BSC(PHY)-403B: OPTICS AND LASERS

Objectives: The course will provide the knowledge about the different phenomenon of visible light which includes the idea of interference, diffraction, polarization and some fundamentals concepts of Laser and their usefulness and applications.

Learning Outcomes:

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

- Discuss the important areas of interference & diffraction with experiments associated with it.
- Differentiate between Fraunhofer and Fresnel diffraction.
- Apply skill to find the wavelength of spectral lines using Plane diffraction grating
- Distinguish the methods of polarisation by reflection, refraction and scattering
- Explain the Brewsters law and Malus law

Describe the different types of lasers, its principle, properties of laser beam.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

SCHEME OF STUDIES

B.SC. NON-MEDICAL PART

III PROGRAMME CODE:

BSC-NM

SEMESTER V

Course Code	Course Opted	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
BSC(PHY)-503A	Core Course-IA	Analog Electronics	2	50	35	15
BSC(PHY)-503B	Core Course-IB	Solid State Physics	2	50	35	15
BSC(PHY)-503P	Practical	Physics Practical	2	50	50	--
			Total Credits: 06	Total Marks: 150		

SEMESTER VI

Course Code	Course Opted	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
BSC(PHY)-603A	Core Course-IA	Digital Electronics	2	50	35	15
BSC(PHY)-603B	Core Course-IB	Nuclear and Particle Physics	2	50	35	15
BSC(PHY)-603P	Practical	Physics Practical	2	50	50	--
			Total Credits: 06	Total Marks: 150		

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

Semester-V & VI

BSC(PHY)-503A: ANALOG ELECTRONICS

Course Objective: To prepare students to perform the analysis of any Analog electronics circuit. To empower students to understand the design and working of power sources, diodes, transistors. **Course learning outcome:**

Course Learning Outcome: On successful completion of this course, students will be able to:

- Understand the different power sources.
- Understand the current voltage characteristics of semiconductor devices.
- Design and analyze the basic operations of BJT.
- Design and analyze the basic operations of MOSFET

BSC(PHY)-503B: SOLID STATE PHYSICS

Course Objective: Students will gain knowledge of basic theories of solid-state structure. Students will gain knowledge of basic theories of the electronic structure of materials. Students will learn how solid state theory is applied to describe physical behavior of solids and electronic devices.

Course learning outcome:

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

- Relate crystalline structure to X-ray diffraction data and the reciprocal lattice.
- Understand the origin of energy bands, and how they influence electronic behavior.
- Understand the basics of superconductivity.

BSC(PHY)-603A: DIGITAL ELECTRONICS

Course Objective: To acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. To prepare students to perform the analysis and design of various digital electronic circuits.

Course learning outcome:

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

- Design different number system and binary codes.
- Understand digital circuits of different Gates and related Boolean algebra.

BSC(PHY)-603B: NUCLEAR AND PARTICLE PHYSICS

Objectives: To impart knowledge about basic nuclear physics properties and nuclear models for understanding of related reaction dynamics. Further, give knowledge of basic particle Physics.

Learning Outcomes:

- Students will have achieved the ability to:

- Explain the ground state properties of the nucleus for study of the nuclear structure behaviour.
- Demonstration of the shell model and collective model descriptions.
- Explain the radioactivity and various decay processes.
- Basic knowledge nuclear and particle physics. Knowledge and understanding of the elementary particle interactions. Capability of relating the theory predictions and measurements.

PG DEPARTMENT OF PHYSICS

SESSION: 2023-24

Under Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: Bachelor of Science Honors Physics

PROGRAMME CODE: BSCH-PHY

Programme Overview

Duration: 3 Years

Bachelor of Science Honors in Physics programme is designed to prepare students for pursuing higher education or working in industry by introducing advanced ideas and techniques that are applicable in a wide range of Physics learning and application while emphasizing the underlying concepts of Physics. This course provides in-depth understanding of principles and concept of Physics, proficiency in experimentation to understand the theoretical and experimental dimensions of Physics.

Programme Outcomes

1. The graduates will have knowledge of fundamental laws and principles in a variety of areas of Physics along with their applications.
2. The graduates will develop research skills which might include advanced laboratory techniques, numerical techniques, computer algebra, computer interfacing.
3. The graduates will become effective researcher who will be able to provide lucid summation of the scientific literature on a given topic of study.
4. The graduates will develop the skill to plan, execute and report the results of an extended experimental or theoretical Physics based project in a research environment.

Programme Specific Outcomes

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

1. Apply theoretical knowledge of principles and concepts of Physics to practical problems.
2. Use mathematical techniques and interpret mathematical models of physical behavior.
3. Demonstrate the ability to plan, undertake, and report on a programme of original work; including the planning and execution of experiments, the analysis and interpretation of

experimental results.

4. Assess the errors involved in an experimental work and make recommendations based on the results in an effective manner.
5. Develop communication skills, both written and oral, for specialized and non-specialized audiences.

SCHEME OF STUDIES

B.SC. HONORS PHYSICS PART-I

Program Code: BSCH-PHY

SEMESTER I

Course Opted	Course Code	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
Core Course-I	PHY-1.1.1	Mathematical Physics-I	6	150	100	50
Core Course-II	PHY-1.1.2	Mechanics	4	100	70	30
Core Course-II Practical	PHY-1.1.2P	Mechanics Practical	2	50	50	--
Generic Elective-1 (Choose any one course out of the A, B or C)	PHY-1.1.3 A	Chemistry I	4	100	70	30
	PHY-1.1.3 AP	Chemistry Practical	2	50	50	--
	PHY-1.1.3 B	Programming Using C++	4	100	70	30
	PHY-1.1.3 BP	Software-I Lab	2	50	50	--
	PHY-1.1.3 C	Basic Mathematics	6	150	100	50
Ability Enhancement Compulsory Course-I	PHY-1.1.4	English (Communication Skills)	2	50	35	15
Ability Enhancement Compulsory Course-II	PHY-1.1.5A/B*	Punjabi Compulsory/ Punjabi Mudla Gyan*	2	50	35	15
Ability Enhancement Compulsory Course-III	PHY-1.1.6	Drug Abuse: Problem, Management and Prevention	(Qualifying Paper)	50	50	--
Interdisciplinary Choice Based Course (Choose any one course carrying 2 credits. The second part carrying another 2 credits will be opted in the next semester to complete 4 credits with the same course.)	IDC-101	A. Fine Arts-I	2	50	35	15
		B. Music Vocal-I	2	50	35	15
		C. Gurmat Sangeet-I	2	50	35	15
		D. Religious Studies-I	2	50	35	15
		E. Creative Writing-I	2	50	35	15
		F. Punjabi Folk Stream and Culture-I	2	50	35	15
		G. Health and Fitness	2	50	35	15
		H. Consumerism in India-I	2	50	35	15
			24	**600**		

*A student can opt for Punjabi Mudla Gyan under the following conditions:

1. Those students who have passed their Matric Examination outside the State of Punjab and have not opted for Punjabi Subject in Matric.
2. Wards of Defense/Para-Military Personnel.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

SCHEME OF STUDIES

B.SC. HONORS PHYSICS PART-I

Program Code: BSCH-PHY

SEMESTER II

Course Opted	Course Code	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
Core Course-III	PHY-1.2.1	Electricity and Magnetism	4	100	70	30
Core Course-III Practical	PHY-1.2.1P	Electricity and Magnetism Practical	2	50	50	--
Core Course-IV	PHY-1.2.2	Waves and Optics	4	100	70	30
Core Course-IV Practical	PHY-1.2.2P	Waves and Optics Practical	2	50	50	--
Generic Elective-2 (Choose any one course out of the A, B or C but same as in previous semester)	PHY-1.2.3 A	Chemistry-II	4	100	70	30
	PHY-1.2.3 AP	Chemistry Practical	2	50	50	--
	PHY-1.2.3 B	Web Development Using PHP	4	100	70	30
	PHY-1.2.3 BP	Software – II Lab	2	50	50	--
	PHY-1.2.3 C	Differential Equations	6	150	100	50
Ability Enhancement Compulsory Course-IV	PHY-1.2.4	English (Communication Skills)	2	50	35	15
Ability Enhancement Compulsory Course-V	PHY-1.2.5A/B*	Punjabi Compulsory/ Punjabi Mudla Gyan*	2	50	35	15
Ability Enhancement Compulsory Course-VI	PHY-1.2.6	Environmental and Road Safety Awareness	4	100	70	30
Interdisciplinary Choice Based Course (Choose any one course carrying 2 credits which is the second part of the same course chosen in previous semester carrying 2 credits. This makes a total of 4 credits with the same course.)	IDC-102	A. Fine Arts-II	2	50	35	15
		B. Music Vocal-II	2	50	35	15
		C. Gurmat Sangeet-II	2	50	35	15
		D. Religious Studies-II	2	50	35	15
		E. Creative Writing-II	2	50	35	15
		F. Punjabi Folk Stream and Culture-II	2	50	35	15
		G. Yoga and Stress Management	2	50	35	15
		H. Consumerism in India-II	2	50	35	15
			28	**700**		

*A student can opt for Punjabi Mudla Gyan under the following conditions:

1. Those students who have passed their Matric Examination outside the State of Punjab and have not opted for Punjabi Subject in Matric.
2. Wards of Defense/Para-Military Personnel.

Semester-I & II

PHY-1.1.1: MATHEMATICAL PHYSICS – I

Course Objective: The purpose of the course is to introduce students to methods of mathematical physics and to develop required mathematical skills to solve differential equations in various fields of physics.

Course learning outcome:

Students will have achieved the ability to:

- Concept of limit and continuity
- Intuitive ideas of continuous, differentiable functions
- Describe the partial differential equations and its applications
- Solve various problems of vector integration

PHY-1.1.2: MECHANICS

Course Objective: The purpose of the course is to train the students in the Newtonian Mechanics and Special Theory of Relativity formalisms to an extent that they can use these in the modern branches of Physics.

Course learning outcome:

On successful completion of the course, Students will be familiar with:

Newtonian Mechanics and Special Theory of Relativity formalisms and they will be able to use these in the modern branches of Physics.

PHY-1.2.1: ELECTRICITY AND MAGNETISM

Course Objective: The purpose of the course is to expose students to Electrostatics and Magnetostatics, Maxwell equations and their applications and analysis of Alternating current circuits. **Course learning outcome:**

Students will have achieved the knowledge of Electrostatics and Magnetostatics, Maxwell equations and their applications and analysis of Alternating Current circuits.

PHY-1.2.2: WAVES AND OPTICS

Objectives: The course covers concept of waves longitudinal as well as transverse, wave equation, wave and group velocity. It also covers the Interference, diffraction and polarization of light and their applications.

Learning Outcomes:

- Students will be able to articulate and describe:
- Understand the concept of waves and their motion
- The concept of interference with many experiments associated with it.
- Differentiate between Fraunhofer and Fresnel diffraction
- Apply skill to find the wavelength of spectral lines using Plane diffraction grating
- Distinguish the methods of polarisation

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

SCHEME OF STUDIES

B.SC. HONOURS PHYSICS PART II
Program Code: BSCH-PHY

SEMESTER III

Course Opted	Course Code	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
Core Course-V	PHY-2.1.1	Mathematical Physics-II	6	150	100	50
Core Course-VI	PHY-2.1.2	Thermal Physics	4	100	70	30
Core Course-VI Practical	PHY-2.1.2P	Thermal Physics Practical	2	50	50	--
Core Course-VII	PHY-2.1.3	Analog Systems and Applications	4	100	70	30
Core Course-VII Practical	PHY-2.1.3P	Analog Systems and Applications Practical	2	50	50	--
Skill Enhancement Course-1	PHY-2.1.4	Radiation Safety	1	50	--	25
		Radiation Safety Practical	1		--	25
Generic Elective-3 (Student will choose any one paper out of the three but other than chosen in Semester-I and II)	PHY-2.1.5 A	Chemistry I	4	100	70	30
	PHY-2.1.5 AP	Chemistry Practical	2	50	50	--
	PHY-2.1.5 B	Programming Using C++	4	100	70	30
	PHY-2.1.5 BP	Software-I Lab	2	50	50	--
	PHY-2.1.5 C	Basic Mathematics	6	150	100	50
			26	**650**		

SEMESTER IV

Course Opted	Course Code	Course Name	Credits	Maximum Marks	External Examination	Internal Assessment
Core Course-VIII	PHY-2.2.1	Quantum Mechanics	4	100	70	30
Core Course-VIII Practical	PHY-2.2.1P	Quantum Mechanics Practical	2	50	50	--
Core Course-IX	PHY-2.2.2	Spectroscopy	4	100	70	30
Core Course-IX Practical	PHY-2.2.2P	Spectroscopy Practical	2	50	50	--
Core Course-X	PHY-2.2.3	Digital Systems and Applications	4	100	70	30
Core Course- X Practical	PHY-2.2.3P	Digital Systems and Applications Practical	2	50	50	--
Skill Enhancement Course - 2	PHY-2.2.4	Applied Optics	1	50	--	25
		Applied Optics Practical	1		--	25
Generic Elective-4 (Student will choose any one paper out of the three but same subject as chosen in Semester-III)	PHY-2.2.5 A	Chemistry-II	4	100	70	30
	PHY-2.2.5 AP	Chemistry Practical	2	50	50	--
	PHY-2.2.5 B	Web Development Using PHP	4	100	70	30
	PHY-2.2.5 BP	Software – II Lab	2	50	50	--
	PHY-2.2.5 C	Differential Equations	6	150	100	50
			26	**650**		

Semester-III & IV

PHY-2.1.1: MATHEMATICAL PHYSICS – II

Course Objective: The purpose of the course is to introduce students to methods of mathematical physics and to develop required mathematical skills to solve problems in quantum mechanics, electrodynamics and other field of Physics.

Course learning outcome: Students will have achieved the ability to:

- Use of Fourier series in various problems
- Use and solution of Legendre and Bessel polynomials
- Describe special function and their recurrence relations
- Explain beta and gamma functions
- Explain the error theory and its various laws

  Describe the partial differential equations and its applications

PHY-2.1.2: THERMAL PHYSICS

Course Objectives:

- To familiarize them with the various laws of thermodynamics and their applications.
- To have knowledge of entropy and heat engines.
- Familiarize with various thermodynamic potentials and application to Clausius-Clapeyorn equation and Joule's-Thomson Effect.
- To acquaint the concept Kinetic Theory of Gases**.**

Course learning outcome: On successful completion of this course, students will be able to:

- Understand the laws of thermodynamics, entropy, and Maxwell's thermodynamic relations etc.
- Acknowledge the concept Heat Engines, application to Clausius- Clapeyorn equation and Joule's- Thomson effect
- Understand the basics of Kinetic theory of gases-distribution of velocities etc.

PHY-2.1.3: ANALOG SYSTEMS AND APPLICATIONS

Course Objectives: The main objective of the course is to provide knowledge of basic semiconducting devices such as diodes, transistors, amplifiers, oscillators and their applications.

Course learning outcome:

Students will have achieved the ability to:

- To understand fundamentals of semiconducting diodes, rectifier diodes, zener

diode and applications.

- To understand about Bipolar Junction Transistor.
- To understand basic function of single stage amplifier, multistage amplifier and power Amplifier and their working principle.
- To understand basic construction of feedback circuits and their application in oscillators
- To understand basic amplifier and oscillator circuits and their application in analog circuits.
- To understand operational Amplifier and its applications.

SKILL ENHANCEMENT COURSE-1 PHY-2.1.4: RADIATION SAFETY

Course Objective: To know the general concepts of Interaction of Radiation with Matter: Types of Radiation, Radiation Detection and Monitoring Devices, Radiation Quantities and Units and Radiation Safety Management.

Course learning outcome:

- Be aware and understand the hazards of radiation and the safety measures to guard against these hazards.
- Have a comprehensive knowledge about the nature of interaction of matter with radiations like gamma, beta, alpha rays, neutrons etc. and radiation shielding by appropriate materials.
- Know about the units of radiations and their safety limits, the devises to detect and measure radiation, such as the Geiger-Mueller counter and scintillation counters.
- The students are expected to learn radiation safety management, biological effects of ionizing radiation, operational limits and basics of radiation hazards evaluation and control, radiation protection standards, 'International Commission on Radiological Protection' (ICRP) its principles, justification, optimization, limitation, introduction of safety and risk management of radiation. Nuclear waste and disposal management, brief idea about 'Accelerator driven Sub- Critical System' (ADS) for waste management.
- The students are expected to do various experiments based on radiation safety.

PHY-2.2.1: QUANTUM MECHANICS

Course Objectives- The objective of the course on Quantum Mechanics for the student of B.Sc. (Hons.) Physics is to equip them with the knowledge of wave particle duality, Planck's quantum, fundamental of quantum relations, and related problems and applications.

Course learning outcome: Students will have achieved the ability to:

- The basic laws of quantum and their relations etc.
- Interpretation of wave function and its properties
- Solve Schrodinger equation and related problems
- One and many atom spectra and related phenomenon

PHY-2.2.2: SPECTROSCOPY

Course Objectives- The objective of the course on Spectroscopy for the student of B.Sc. (Hons.) Physics is to equip them with the knowledge of various theories related to single and multi-atom interaction spectra, various types of orbital coupling and properties and production of X-ray.

Course learning outcome: Students will have achieved the ability to:

- Understand the single and multi-atom system spectra
- Understand effect of electric and magnetic field on the spectrum
- Understand various type of coupling of orbitals
- Understand production and properties of x-ray

PHY-2.2.3: DIGITAL SYSTEMS AND APPLICATIONS

Course Objective: The main objective of this course is to provide basic knowledge of Digital Electronics to design digital circuits using diodes, transistors; to solve Boolean expressions; to understand various combinational circuits such as logic gates, adders, subtractors, multiplexers, de-multiplexers and to understand various sequential circuits such as flip-flops, shift registers etc.

Course learning outcome: Students will have achieved the ability to:

- Learn function of basic digital circuits and use of transistors to create logic gates in order to perform Boolean logic.
- Learn different theorems for simplification of basic Digital electronics circuits.
- Understands symbols, Truth tables, Boolean equations, & working principle.
- Understand combinational and sequential logics and their differences.
- Understand flip-flop and shifts register.
- Recognize and analyze the basic digital circuits.

SKILL ENHANCEMENT COURSE 2 PHY-2.2.4: APPLIED OPTICS

Course Objectives: The aim of this course is not just to impart theoretical knowledge of optics to the students but to enable them to develop an awareness and understanding about its various practical uses in different areas like holography, fibre optics, lasers etc. The practical will

provide a hands-on training related to all these applications.

Course Outcomes: Within the course structure offered, students will gain a good understanding of the building blocks of lasers, Fourier optics, holography and fiber optics. In particular, they will be able to:

- Predict fundamental (and ultimate) characteristics of laser systems
- Find the interrelations between Einstein coefficients
- Understand the basic Non-linear optics
- Understand the basic holography and optical fiber communication

SCHEME OF STUDIES
Program Code: BSCH-PHY

B.SC. HONORS PHYSICS PART III
SEMESTER V

Course Code	Course Opted	Course Name		Credits	Maximum Marks	External Marks	Internal Marks
PHY-3.1.1	Core Course-XI	Nuclear Physics		4	100	70	30
PHY-3.1.1P	Core Course-XI Practical	Nuclear Physics Practical		2	50	50	--
PHY-3.1.2	Core Course-XII	Solid State Physics		4	100	70	30
PHY-3.1.2P	Core Course-XII Practical	Solid State Physics Practical		2	50	50	--
PHY-3.1.3* & PHY-3.1.4*	Discipline Specific Elective-1* & Discipline Specific Elective-2*	A	Experimental Techniques	4	100	70	30
		AP	Experimental Techniques Practical	2	50	50	--
		B	Physics of Devices and Instruments	4	100	70	30
		BP	Physics of Devices and Instruments Practical	2	50	50	--
		C	Classical Dynamics	6	150	100	50
		D	Atmospheric Physics	4	100	70	30
		DP	Atmospheric Physics Practical	2	50	50	--
		E	Nano Materials and Applications	4	100	70	30
		EP	Nano Materials and Applications Practical	2	50	50	--
		F	Medical Physics	6	150	100	50
		G	Laser Physics	4	100	70	30
		GP	Laser Physics Practical	2	50	50	--
		H	Particle Physics and Accelerators	6	150	100	50
				24	**600**		

* Discipline Specific Elective Papers: Student will choose any two papers.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

SCHEME OF STUDIES
Program Code: BSCH-PHY

B.SC. HONORS PHYSICS PART III
SEMESTER VI

Course Code	Course Opted	Course Name		Credits	Maximum Marks	External Marks	Internal Marks
PHY-3.2.1	Core Course-XIII	Electromagnetic Theory		4	100	70	30
PHY-3.2.1P	Core Course-XIII Practical	Electromagnetic Theory Practical		2	50	50	--
PHY-3.2.2	Core Course-XIV	Statistical Mechanics		6	100	100	50
PHY-3.2.3* & PHY-3.2.4*	Discipline Specific Elective-1* & Discipline Specific Elective-2*	A	Experimental Techniques	4	100	70	30
		AP	Experimental Techniques Practical	2	50	50	--
		B	Physics of Devices and Instruments	4	100	70	30
		BP	Physics of Devices and Instruments Practical	2	50	50	--
		C	Classical Dynamics	6	150	100	50
		D	Atmospheric Physics	4	100	70	30
		DP	Atmospheric Physics Practical	2	50	50	--
		E	Nano Materials and Applications	4	100	70	30
		EP	Nano Materials and Applications Practical	2	50	50	--
		F	Medical Physics	6	150	100	50
		G	Laser Physics	4	100	70	30
		GP	Laser Physics Practical	2	50	50	--
		H	Particle Physics and Accelerators	6	150	100	50
				24	**600**		

*Discipline Specific Elective Papers: Student will choose any two papers but other than two chosen in previous semester.

SEMESTER V & VI
PHY-3.1.1: NUCLEAR PHYSICS

Course Objectives: To impart knowledge about basic nuclear physics properties and nuclear models for understanding of related reaction dynamics.

Course learning outcomes: Students will have achieved the ability to:

- Explain the ground state properties of the nucleus for study of the nuclear structure behavior.
- Demonstration of the shell model and collective model descriptions.
- Explain the radioactivity and various decay processes.
- Apply various aspects of nuclear reactions in view of compound nuclear dynamics.

PHY-3.1.2: SOLID STATE PHYSICS

Course Objectives: To study some of the basic properties of the condensed phase of matter especially solids. This paper enables the students to understand about crystal structure, Lattice vibration, Free electron theory, magnetic properties of matter, Band theory of solids, electrical and thermal properties of semiconductors and superconductivity phenomenon.

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

- Understand the Physics behind structural, magnetic and electrical behaviour of the solids.
- Tailor the properties of the solids with proper understanding.
- Understand the physical process underlying many solid-state devices.
- Understand the concept of superconductors.
- Pursue the research work in the field of material science.

PHC-3.1.3: MEDICAL PHYSICS

Course Objective:

- Focus on the application of Physics to clinical medicine.
- Gain a broad and fundamental understanding of Physics while developing particular expertise in medical applications.
- Learn about the human body, its anatomy, physiology and Bio-Physics, exploring its performance as a physical machine. Other topics include the Physics of the senses.
- He / She will study diagnostic and therapeutic applications like the ECG, radiation Physics, X-ray technology, ultrasound and magnetic resonance imaging.
- Gain knowledge with reference to working of various diagnostic tools, medical imaging techniques, how ionizing radiation interacts with matter, how it affects living organisms and how it is used as a therapeutic technique and radiation safety practices
- Imparts functional knowledge regarding need for radiological protection and the sources of an approximate level of radiation exposure for treatment purposes.
- In the laboratory course, the student will be exposed to the workings of various medical devices. He / she gets familiarized with various detectors used in medical imaging, medical diagnostics.

Course learning outcomes: Students will have achieved the ability to:

- Explain about the human body, its anatomy, physiology and Bio-Physics, exploring its performance as a physical machine.
- Explain various diagnostic tools, medical imaging techniques, how ionizing radiation

interacts with matter, how it affects living organisms and how it is used as a therapeutic technique and radiation safety practices

- Know about need for radiological protection and the sources of an approximate level of radiation exposure for treatment purposes.

PHY-3.1.4: CLASSICAL DYNAMICS

Course Objective: The purpose of the course is to train the students in the Newtonian Mechanics and Special Theory of Relativity formalisms to an extent that they can use these in the modern branches of Physics.

Course learning outcome: On successful completion of this course, students will be able to:

- Understand the Hamilton's principle and D' Alembert Principle.
- Understand the concept of Hamilton's equations of motion.
- Acknowledge the concept of Poisson brackets and Canonical transformations.
- Solve Lagrange's equations of motion for small oscillations.
- Understand the concept of Special Theory of Relativity and basics of Space-Time intervals, Four vectors, concept of four-force and four-momentum etc.
- Explain the Covariant form of Maxwell's field Equations in term of Electromagnetic Field Tensor.

PHY-3.2.1: ELECTROMAGNETIC THEORY

Course Objectives: The students are exposed to Maxwell's equations, propagation of electromagnetic (EM) waves in different homogeneous-isotropic as well as anisotropic unbounded and bounded media, production and detection of different types of polarized EM waves, general information as waveguides.

Course learning outcome:

- Students will be able to understand Maxwell equations in different media.
- Students will understand the concept of polarization of EM waves and its propagation.
- Students will understand the concept of wave guides and process of energy transmission.

PHY-3.2.2: STATISTICAL MECHANICS

Course Objective: The Statistical Mechanics deals with the derivation of the macroscopic parameters (internal energy, pressure, specific heat etc.) of a physical system consisting of large number of particles (solid, liquid or gas) from knowledge of the underlying microscopic behavior of atoms and molecules that comprises it. The main objective of this course work is to introduce

the techniques of Statistical Mechanics which has applications in various fields including Astrophysics, Semiconductors, Plasma Physics, Bio-Physics, chemistry and in many other directions.

Course learning outcome:

- Understand the concepts of phase space and thermodynamic probability.
- Three different distribution laws e.g. Maxwell-Boltzmann distribution, Bose-Einstein distribution and Fermi-Dirac distribution laws of particles and their derivation.
- Comprehend and articulate the connection as well as dichotomy between classical statistical mechanics and quantum statistical mechanics.
- Understand the application of F-D statistical distribution law to derive thermodynamic functions of a degenerate Fermi gas, electron gas in metals and their properties.
- Calculate electron degeneracy pressure and ability to understand the Chandrasekhar mass limit, stability of white dwarfs against gravitational collapse.
- Regular assignments related to problems given by the course instructor.

PHY-3.2.3: LASER PHYSICS

Course Objectives: The aim of this course is not just to impart theoretical knowledge of lasers, its structure, design and properties but also to provide the students a basic knowledge of its various applications in different areas like holography, fibre optics and non-linear optics. The practical related to its lab will provide a hands-on training related to these applications.

Course Learning Outcomes: Within the course structure offered, students will gain a good understanding of the building blocks of lasers, its applications to fiber optics communication, holography and non-linear optics. In particular, they will be able to:

- Understand the basic interaction phenomenon
- find the interrelations between Einstein coefficients
- concept of line broadening
- predict fundamental characteristics of laser systems
- Understand the basic holography and optical fiber communication
- solve the rate equations in steady state for a laser
- describe the major examples of laser systems
- Understand the basics of optical fiber

- Basics of its different applications viz. holography & non-linear optics

PHY-3.2.4: PARTICLE PHYSICS AND ACCELERATORS

Course Objectives: To impart knowledge about basic Particle Physics and various Accelerators.

Course learning outcomes: Students will have achieved the ability to:

- Basic knowledge of the various particle accelerators.
- Basic knowledge nuclear and particle physics. Knowledge and understanding of the elementary particle interactions. Capability of relating the theory predictions and measurements.
- Understanding of various particle interactions and their interrelation. Relation of basic laws of particle physics and macroscopic physics phenomena. Usage of basic laws in determination of particle properties and properties of processes in the subatomic world.

PG Department of Chemistry

Session: 2023-2024

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (Cos) of the Programmes.

Programme Name: B.Sc. (Hons) Chemistry

Programme Outcomes (PO)

After completing B.Sc. Chemistry programme, students will be able to:

1. Understand scientific information in a clear and concise manner.
2. Undertake higher study and research in inter and multi-disciplinary areas of sciences.
3. Inculcate scientific temperament among the students to develop a logical scientific understanding and implementation of the policies to tackle the burning issues at global and local level.
4. Create awareness and sense of responsibilities towards environment and apply knowledge to solve the issues related to Environmental pollution.

Programme Specific Outcome (PSO)

1. Exhibit and apply the fundamental knowledge of the basic principles in of Chemistry
2. Collaborate effectively on team-oriented projects in the field of Chemistry or other related fields.
3. Address environmental pollution issues and the remedies thereof.
4. Apply the knowledge to develop the sustainable and eco-friendly technology in Industrial Chemistry
5. To develop their critical thinking, judgment and communication skills.

B.Voc (Pharmaceutical Chemistry)

Programme Outcomes

After completing B.Voc. Pharmaceutical Chemistry programme, students will be able to:

1. Understand need, importance and use of lab management techniques.
2. Create awareness and sense of responsibilities towards Good Lab Practices.

   Undertake higher study/job in the field of pharmaceutical/chemical sciences based institutes/industries.

Programme Specific Outcome (PSO)

1. Exhibit and apply the fundamental knowledge of Safely handling glass ware and chemicals.
2. Collaborate effectively on team-oriented projects in the field.
3. Apply the knowledge to employ Good Lab Practices while working in chemical laboratories.

   Make the students efficient enough to use sophisticated instruments used in Pharmaceutical Industries.

Prgramme Name: BSc. (Med/ Non Med)

Program Outcomes (PO)

After completing B.Sc. Chemistry programme, students will be able to:

1. Understand scientific information in a clear and concise manner.
2. Undertake higher study and research in inter and multi-disciplinary areas of sciences.
3. Inculcate scientific temperament among the students to develop a logical scientific understanding and implementation of the policies to tackle the burning issues at global and local level.
4. Create awareness and sense of responsibilities towards environment and apply knowledge to solve the issues related to Environmental pollution.

Programme Specific Outcome (PSO)

1. Exhibit and apply the fundamental knowledge of the basic principles in of Chemistry
2. Collaborate effectively on team-oriented projects in the field of Chemistry or other related fields.
3. Address environmental pollution issues and the remedies thereof.
4. Apply the knowledge to develop the sustainable and eco-friendly technology in Industrial Chemistry
5. To develop their critical thinking, judgment and communication skills.

BSc (Hons.) Chemistry

Course Outcomes

BHC-101 Inorganic Chemistry-I

1. To impart the students concept of fundamentals of quantum mechanics and its application in study of structure of atoms and stability of atoms.
2. Compare and contrast interactions known as covalent, ionic and hydrogen bonding.

3. To learn about the periodic properties. Students should be able to distinguish VBT, MOT and VSEPR theories

BHC-102 Physical Chemistry-I

1. This course would help the student understand the basic postulates of kinetic molecular model of gas, derivation of the kinetic and the ideal gas equation.
2. Also it would introduce the concept of real and ideal gases and their difference, deviation of real gas from ideal gas behaviour and understanding the concept of Van der Waals equation of state.
3. It would take into account Maxwell distribution of gases and derivation of various velocities from it.
4. It would give an overview about the structure and properties of solids and liquid crystals, symmetry elements, crystal systems and X-ray diffraction patterns would be well marked in this course.
5. To learn about the ionic equilibria and electrical properties of ions in solution. Also the concepts of acids and bases, pH and buffer solutions

BHC-101 P: Inorganic Chemistry Practical-I

1. Calibration and use of various apparatus.
2. To develop skills in the preparation of solutions of various concentrations.
3. To carry out various volumetric acid base titrations, oxidation- reduction titrations, iodine titrations.
4. To carry out complexometric titrations using EDTA used for the determination of hardness of water.

BHC-102 P Physical Chemistry Practical-I

1. This course would give brief insight about good lab practices including on how to assign storage code labels and information regarding Chemical packaging.
2. To determine the viscosity of various solvents using different methods.
3. Preparation of buffers and their physical importance.
4. To carry out various pH metric acid base titrations using pH meter. The student will be able to handle the sophisticated physical chemistry apparatus.

BHC-201 Organic chemistry

1. To learn and apply various concepts such as stereochemistry and fundamental principles of stereoselectivity in organic chemistry.
2. Identify and differentiate prochirality and chirality at centers, axis, planes and helices and determine the absolute configuration.
3. Evaluate the stability of various conformers of acyclic and cyclic systems using steric, electronic and stereoelectronic effects and correlate them to reactivity.
4. To learn about various method of preparations of Hydrocarbons and their chemical properties and stability order
5. Evaluate the stability of reaction intermediate and reaction mechanisms.

BHC-202 Physical Chemistry-II

1. Understanding the basic definition of system, surrounding, extensive and intensive properties, path and state functions.
2. Calculation of various thermodynamic parameters for real and ideal gas. To learn about the laws of thermodynamics- zeroth, first, second and third law.
3. The concept of thermochemistry would be beneficial for the students to analyze the chemical reactions and the calculation of bond energies pertaining to them.
4. Understand the concept of partial molar properties. To learn, analyze and work out various problems based on chemical equilibrium.
5. To inculcate the knowledge of various dilute solutions and colligative properties and their measurement techniques

BHC-201 P Organic Chemistry Practical-I

1. To impart the skills to the students to carry out various organic chemistry practicals carefully and to handle the chemicals cautiously
2. To calibrate the thermometers used in the labs. Physcial methods of purification-crystallization of various organic compounds using various solvents.
3. To determine the melting points of various compounds and also to determine the melting point of the mixtures. Determination of boiling points of various liquids

BHC-202 P Physical Chemistry Practical-II

1. To provide an insight into the thermochemistry which is useful in predicting reactant and product throughout the course of given reaction.

2. To calculate various thermodynamic parameters experimentally

BHC-301Inorganic Chemistry-II

1. To learn about various concepts of acids and bases and understanding the details of hard soft acid base concept (HSAB) and their various applications
2. To understand the chemistry of s and p block elements and the vital role of their ions and compounds in biological systems.
3. To understand the general principles of metallurgy and various extraction of metals. To study the various preparation and applications of inorganic polymers.
4. To learn about the noble gases-their occurrence, chemistry, reactions and reactivity

BHC-301P Inorganic Chemistry Practical –II

1. To develop skills required for carrying out inorganic preparations.

BHC-302 Organic Chemistry- II

1. Students will study about chemistry of halogenated hydrocarbons focusing on alkyl halides and aryl halides.
2. Students will learn general methods of preparations and chemical reactivity of alcohols, phenols and ethers & epoxides.
3. Students will get to know about the basics of carbonyl compounds and various condensation reactions along with their mechanisms. Subject is helpful for students as it gives keen knowledge about carboxylic acids and their derivatives

BHC-302P Organic Chemistry Practical - II

1. To develop skills required for qualitative analysis of unknown organic compounds containing simple functional groups.

BHC-303 Physical Chemistry – III

1. To acquire knowledge about phase, components, phase rule and explain phase diagrams.
2. Understanding the basics of chemical Kinetics like determination of order, molecularity, theories of reaction rates, rates of complex reactions, application of steady state kinetics and approximation.
3. The subject will also provide an insight about the concept of different type of catalysis like enzyme catalysis, acid – base catalysis etc.

4. To recognize the basic concepts of surface chemistry and apply the knowledge to analyze the different types of adsorption isotherms (Langmuir, Freundlich and BET adsorption isotherms)

BHC-303P Physical Chemistry Practical - III

1. The students will learn how to practically determine CST ,CSC, distribution coefficient and molecular weight
2. They will learn to determine various physical properties like surface tension, adsorption.

BHC-304 PHARMACEUTICAL CHEMISTRY

1. To acquaint the students with the basic understanding of drug discovery, synthesis of drug of various classes, role of fermentation in pharmaceutical chemistry.

BHC-401 INORGANIC CHEMISTRY-III

1. To understand the basic terminology of the coordination compounds and naming these compounds using various rules of their nomenclature. To learn about the isomerism and to get an overview about the stereochemistry of coordination compounds.
2. Calculation of the magnetic moments of various coordination complexes and later on predicting what type of complexes they would form according to valence bond theory.
3. Qualitative aspects of ligand field and molecular orbital theory.
4. Also this course examines the preparation, general trends and stability patterns of first, second and third transition metals, explaining in details the chemistry of elements of first transition series, Along with this, the course lays emphasis on the chemistry and various properties of inner transition elements.
5. The students should be able to analyze the bioinorganic chemistry underlying the role of metal ions in various biological systems and the details role of haemoglobin and myoglobin in the bio-systems.

BHC-402 ORGANIC CHEMISTRY - III

1. The students will acquire knowledge of preparation and reactions of nitrogen containing functional groups.
2. Demonstrate knowledge about structure and the mechanism of reactions of selected polynuclear hydrocarbons.

3. The subject will impart fundamental knowledge about structure, mechanism of reactions of important heterocyclic compounds.

BHC-403 PHYSICAL CHEMISTRY - IV

1. To acquire knowledge about basics of electrochemistry like conductance resistance, resistivity and basic principle of laws of electrochemistry.
2. To describe and explain Arrhenius theory of electrolytic dissociation, Kohlrausch law of independent migration of ions, Debye-Huckel- Onsager equation.
3. Understanding about chemical cells, electrodes and their functions. Students can learn about EMF measurements, conductometric and potentiometric titrations.

BHC-404 CHEMISTRY OF COSMETICS AND PERFUMES

1. To make the students aware about the importance of chemistry in the Cosmetic industries.
2. Render the students knowledgeable about the making of shampoos, soaps and creams etc.
3. It will allow the students to prepare various cosmetic formulations in laboratory.

BHC-401P INORGANIC CHEMISTRY PRACTICAL - III

1. Students will learn the required skill to carry out quantitative gravimetric inorganic method of analysis and redox titrations including Iodo/Iodimetric titrations.

BHC-402P ORGANIC CHEMISTRY PRACTICAL –III

1. After the completion of practical course, students will be able to carry out various organic preparations.
2. They will learn how to synthesize derivatives such as oximes, semicarbazones of carbonyl compounds.

BHC-403P PHYSICAL CHEMISTRY PRACTICAL -IV

1. Students will get experimental knowledge about basic instrumental methods used in physical chemistry like conductometry and potentiometry.

BHC-501 INORGANIC CHEMISTRY –IV

1. To give the students a knowledge of the different theories to explain bonding between metal & ligand in coordination compounds.
2. To know and understand the different properties and structures for organometallic compounds from different parts of the periodic table and their trends.

3. To improve the level of understanding of metal carbonyl & metal clusters.

BHC-502 ORGANIC CHEMISTRY-IV

1. The subject will offer the students basic understanding of the chemistry of Nucleic acids, Amino acids, Proteins , Enzymes ,carbohydrates and lipids.
2. The students will be able to know the concept of energy in biosystems through catabolic pathways like Glycolysis, Krebs cycle and fermentation.
3. The subject will unveil the chemical basis of life in living organisms.

BHC-503 PHYSICAL CHEMISTRY-V

1. Students gain knowledge about:-Basic non-relativistic quantum mechanics.
2. The time-dependent and time-independent Schrödinger equation for simple potentials like for instance the harmonic oscillator and hydrogen like atoms, as well as the interaction of an electron with the electromagnetic field.
3. Approximate methods for solving the Schrödinger equation (the variational method, perturbation theory, Born approximations) Spin, angular momentum states, angular momentum addition rules, and identical particles.
4. Students should be able to have achieved advanced knowledge about interaction of EMR and Matter and their applications in UV, IR, Raman, ESR spectrum to examine the structure of organic compounds.

BHC-501P INORGANIC CHEMISTRY– IV PRACTCAL

1. To develop skills required for qualitative analysis of unknown organic compounds containing simple functional groups.
2. Also give idea about functional group detection by using IR oR NMR spectroscopy.

BHC-502P ORGANIC CHEMISTRY LAB-IV

1. The subject will offer the students basic understanding of the chemistry of Nucleic acids, Amino acids, Proteins , Enzymes and lipids

BHC-503P PHYSICAL CHEMISTRY LAB-V

1. Achieved advanced knowledge about UV, Colorimeter , also give idea about how to find lamda maximum from UV & colorimeter

BHC-601 ORGANIC CHEMISTRY-V

1. The subject will offer the students basic understanding of the Organic spectroscopic techniques like UV, IR and NMR and their application in identification of simple organic molecules.
2. To get an insight into chemistry of dyeing, synthesis and applications of different categories of dyes covering synthetic and natural dyes.
3. The subject will inculcate the basics of carbohydrate and polymer chemistry.
4. After completing the course students will be well aware of concept of chemical structure elucidation.

BHC-602 ANALYTICAL METHODS IN CHEMISTRY

1. To learn about different types of spectroscopic and electroanalytical analysis to examine the structure of molecules.
2. Proficiency in professional samplings and sample treatment prior to analysis.
3. To learn about advanced methods of separations. To learn about working of IR,UV, Flame absorption and emission spectrometry.

BHC-603 RESEARCH METHODOLOGY FOR CHEMISTRY

1. To gain knowledge about Literature study, structural surveys,
2. Also give information about the procedure by which the researchers go about their work of describing, evaluating and predicting phenomenon.
3. It aims to give the work plan of research. It provides training in choosing methods materials, scientific tools and techniques relevant to the solution of the problem.
4. Also define research problem & help to write a research report & thesis.

BHC-604 INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE

1. To produce graduates with enhanced skills, knowledge and research aptitude to carry out higher studies or Research & Development in the various industrial areas.
2. To prepare the students for immediate entry to the workplace with sound knowledge in the areas of silicates, fertilizers, alloys, catalysis and related multidisciplinary fields.
3. Students will be able to describe the industrial production of a number of inorganic gases & inorganic compounds/ chemicals.

4. Students will get a insight into the areas of Inorganic solids, Nanomaterials – their classification, overview and preparation.

BHC-601P ORGANIC CHEMISTRY - V PRACTICAL

1. To develop skills required for qualitative analysis of unknown inorganic compounds containing simple acid or basic radicals. Learn about, how we can verify spectrochemical series by using inorganic preparations.

BHC-602P ANALYTICAL METHODS IN CHEMISTRY PRACTICAL

1. To develop skills required for the use of instruments for analysis of compounds.

BHC-604P INORGANIC MATERIALS OF INDUSTRIAL IMPORTANCE PRACTICAL

1. The course has been designed to suit the requirements of various industries.
2. To make the students familiar with industrial processes involved in commercial production of products

B.Sc (Hons.) Physics Part I

PHY-1.1.3A : Chemistry-I

1. The course will demonstrate the knowledge of fundamental concepts of chemistry and their applications.
2. The students will get an insight into atomic structure, chemical bonding, basics of organic chemistry and aromaticity.

PHY-1.2.3A: Chemistry-II

1. The subject is oriented upon the knowledge of chemical thermodynamics and the laws governing it.
2. The student will acquire the knowledge of fundamental concept of theories related to Acids and Bases and various physical properties and methods involved in liquid state (qualitative treatment only)

PHY-1.1.3AP: Chemistry PRACTICAL

1. After the completion of practical course, students will be able to carry out various volumetric analysis and sepratation of mixtures by chromatography.
2. They will learn how to determine melting point and identify the different components of mixtures.

PHY-1.1.3AP: Chemistry PRACTICAL

1. To develop skills required for semi-micro qualitative analysis of mixtures.

2. Students will be able to find out surface tension and viscosity of different solvents.

B.Voc (Pharmaceutical Chemistry)

Course Outcomes

B.VPC-113 Lab Management I

1. This subject will offer the students a deep insight into the various Good lab practices in pharmaceutical industries.
2. They will be able to understand the importance and right ways of handling and storing chemicals.
3. The subject will inculcate the knowledge of safe handling and safe disposal of chemicals and glassware.

B.VPC-114 General Chemistry-I

1. This course will give an overview about the Structure and Nomenclature of various functional groups.
2. Through this course, the students will have intellectual understanding of bonding and general inorganic chemistry.
3. This course would help the students to understand the basic postulates of kinetic molecular theory of gases.
4. It would give an overview about the structure and properties of various liquids.

B.VPC-115 Practical Paper pertaining to Lab Management I

1. This course will enrich the students regarding the safe handling of chemicals and glassware used in chemical laboratories.
2. Introduction to chemical safety equipment's and segregation of laboratory waste.

B.VPC-116Practical Paper pertaining to General Chemistry I

1. To provide the thorough knowledge of preparation of solution of different concentration of salts, acids, bases and organic compounds.
2. Students will be taught to determine the basic physical properties of solutions using different equipment's.

B.VPC-117 Industrial/Research Laboratory Visit and Report

1. Visit to different chemical based industries/research laboratories will enrich the students regarding the avenues of employability in-field.

B.VPC-118 Workshop and Report

1. Workshop on techniques such as Lab Management, Waste Disposal, and Safe Storage of Chemicals etc. will help the students correlate their theoretical concepts with their practical utility.

B.VPC-211 Introduction to Computers

1. The students will be able to use the basic Microsoft tools including Word, Excel and Power Point.
2. The course will enable the students to present their practicals through chemical drawing.

B.VPC-212 General Microbiology

1. To provide the in-depth knowledge of the basic microbiological techniques, laboratory skills related to the isolation, aseptic culturing methods and pure culture, staining, identification and control of microorganisms

B.VPC-213 Lab Management II

1. The students will be able learn about Good Lab Practices regulation given by different organizations.
2. It is also intended to make students familiar with process documentation practices required in pharmaceutical industries.

B.VPC-214 Basic Analytical Chemistry

1. The course will demonstrate the knowledge about the basic principles of various assay techniques commonly used in quality control department of any pharmaceutical industry.
2. This will also provide the hands-on experience by actually conducting these assays in the lab.
3. The students will also learn about the basics of electro analytical methods.

B.VPC-215 Practical Paper pertaining to Introduction to Computers

1. Hands-on-training for Data Base Managament
2. The students will be able to use spread sheets and create queries in MS Access

B.VPC-216 Practical Paper pertaining to General Microbiology

1. Students will learn the Good Lab Practices and basic techniques to handle Microbes

B.VPC-217 Practical Paper pertaining to Lab Management II and Basic Analytical Chemistry

1. To create inventories of chemicals for safe and efficient utility.
2. Basic knowledge of handling lab equipment's for determination of physical properties of solutions.
3. To introduce the concept of qualitative analysis through titrimetric estimations.

B.VPC-218 Industrial/Research Laboratory Visit and Report

1. Students will be able to understand the theoretical concepts more efficiently by correlating to their use in the related industries.

B.VPC-311: ORGANIC CHEMISTRY

1. Students will acquire knowledge of basic organic chemistry including different functional groups and reaction intermediates.
2. Students will learn stereochemistry and general reaction mechanisms.

B.VPC-314: Organic Chemistry Practical Practical paper pertaining to B.VPC-31

1. Basic knowledge of crystallization, preparation of compounds and detection of Melting point.
2. Students will able to detect functional groups in organic compounds.

B.VPC-318: Seminar

1. Students will assign topics on various instruments/lab management techniques on which they have to present a seminar in front of whole class for 10-15 mins.

B.VPC-413: Basic Chromatographic Techniques

1. The course will enable students to understand the various techniques that can be used for identification of compound right after synthesis and its purification using Chromatographic techniques.

B.VPC-416: Calibration and Applications of Analytical Instruments-III (Practical paper Pertaining to B.VPC-412)

1. Basic knowledge of FT-IR Spectroscopy and dissolution test apparatus.

B.VPC-417: Basic Chromatographic Techniques Practical (Practical Paper Pertaining to B.VPC-413)

1. Students will able to perform identification of compound using Paper Chromatography, Thin Layer Chromatography and Column Chromatography.

COURSE OUTCOME

BSC(CHE) 104A

Inorganic Chemistry-I

1. To teach the fundamental concepts of Inorganic chemistry.
2. Due importance is given to the requisite intellectual understanding of atomic structure, periodic properties, bonding and general inorganic chemistry.

BSC(CHE) 104B

Organic Chemistry-I

1. To aquaint the students with basic concepts of stereochemistry of organic compounds and mechanistic aspects of organic reactions.
2. The course is adequated with basic knowledge of hydrocarbons and students will understand the formations and reactions.

BSC(CHE) 104P:

Chemistry-I Practical

1. To enhance practical skills in students to perform volumetric analysis, element detection in organic compounds and TLC.
2. Students will be able to perform semi- micro qualitative analysis of mixtures

BSC(CHE) 204A:

Physical Chemistry- I

1. To develop and systematically upgrade their knowledge of concepts of thermodynamics and to be able to identify and describe energy exchange processes.
2. The student with the knowledge of the thermodynamics, chemical and ionic equilibrium will understand and explain scientifically the application of the subject to a wide variety of topics in science and engineering, especially physical chemistry, chemical engineering and mechanical engineering.

BSC(CHE) 204B:

Organic Chemistry- II

1. The objective of the Organic Chemistry is to acquaint the student with aromatic and halogenated hydrocarbons and their comparative studies.
2. The course is adequated with basic knowledge of alcohols, phenols, ethers, carbonyl compounds so they will understand the method of formations and reactions of compounds.

BSC(CHE) 204P:

Chemistry-II Practical

1. Students will be able to practically analyze thermochemical aspects of chemical reactions like heat capacity, enthalpy, integral enthalpy
2. They will be able to carry out practicals related to pH measurements and will learn to prepare buffer solutions.
3. Students will get the experimental skill to carry out organic purifications, organic preparations including recrystallisation and melting point determination.

BSc Sem -III

BSC(CHE)-304A - Physical chemistry-II

1. Understand the concept of system, variables,heat, work, and laws of thermodynamics.
2. Students can learn about the concept of heat of reactions and use of equations in calculations of bond energy, enthalpy etc
3. To acquire knowledge about entropy,reversible, irreversible processes and apply knowledge to calculate entropy using third law of thermodynamics.
4. To provide an insight about Joule law, Joule Thompson Effect and inversion temperature of gases.
5. In this course of physical chemistry students will be introduced to basic concepts of chemical equilibrium.

BSc Sem – III

BSC(CHE)-304B-Organic Chemistry-III

1. Students will study about carboxylic acids and their derivatives alongwith their properties.
2. Students will get to know about the properties of fats, oils and detergents.
3. Subject is helpful for students as it gives keen knowledge about organic compounds of nitrogen

BSc Sem -III

BSC(CHE)-304P Chemistry Practical

1. To develop the skills in quantitative analysis so as to estimate the concentration of unknowns in the sample.
2. Students will learn to perform basic chromatographic technique i.e. TLC

Sem –IV

BSC(CHE) 404A - Inorganic chemistry-II

1. To understand the concept of acids and bases.
2. Students are able to describe the role of different metal ions in biological systems.
3. Students come to know about uses of different inorganic polymers in making of tyres etc.
4. The students will be able to understand the detailed concept of organometallic chemistry.

BSc Sem- IV

BSC(CHE) 404B- PHYSICAL CHEMISTRY

1. To provide insight into characteristics of different types of solutions and phase equilibria.
2. The subject enables the students to understand the concept of electrochemical phenomena and electrical properties of ions in solution.

BSc Sem IV Lab

BSC(CHE) 404B –CHEMISTRY PRACTICAL

1. Brief introduction of acids, bases,pH and buffer solution.
2. To inculcate practical skills in students regarding qualitative salt analysis and physical methodology of thermochemistry.

Bsc III Sem – VI

BSC(CHE)504A- Inorganic Chemistry-III

1. To understand basic idea of rotational and vibrational spectroscopy.
2. To understand the concept of acids and bases.
3. Students are able to describe the role of different metal ions in biological systems.
4. Students come to know about uses of different inorganic polymers in making of tyres etc.
5. The students will be able to understand the detailed concept of organometallic chemistry.

BSc III Sem – V

BSC(CHE)504B- Organic Chemistry-IV

1. Enable the students to elucidate various spectroscopic methods used for characterization of organic compounds

2. To understand basic concept of absorption spectroscopy.
3. To have an idea about organometallic compounds and organosulphur compounds

BSc III Sem –V Lab
BSC(CHE)504P-CHEMISTRY PRACTICAL

1. The subject will provide basic knowledge about column chromatography, so students will be able to separate the mixture of dyes and leaf pigments from spinach leaves.
2. To acquire knowledge how they can determine the strength of given acid conductometrically and pH- metrically
3. To provide an insight into the method of determination of molar refraction.
4. The subject will impart fundamental knowledge about distribution coefficient and distribution law of immiscible liquids

BSc III Sem- VI

BSC(CHE)604A- INORGANIC CHEMISTRY-IV

1. To give the students a knowledge of the different theories to explain bonding between metal & ligand in coordination compounds.
2. To know and understand the different properties and structures for organometallic compounds from different parts of the periodic table and their trends.
3. To improve the level of understanding of metal carbonyl & metal clusters.

BSc III Sem- VI

BSC(CHE)604B- PHYSICAL CHEMISTRY-IV

1. The students will get a deep insight into the concept of Raman Spectroscopy.
2. To understand the basic concept of Electronic spectrum.
3. To get an overview about the structures of solid crystals.
4. The students will be able to understand different laws of crystallography.
5. Enable the students to understand the concept of photochemistry and its laws.

BSc III Sem- VI
BSC(CHE)604B- CHEMISTRY PRACTICAL

1. To develop skills required for qualitative analysis of unknown organic compounds containing simple functional groups.
2. Also give idea about functional group detection by using IR oR NMR spectroscopy.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG Department of Mathematics

Session 2023-24

UNDER GRADUATE COURSES

Programme outcomes (PO s), Programme Specific outcomes (PSO s) and Course outcomes (CO s) of the Programmes.

Programme Name: B.Sc. (Hons.) Mathematics

Programme outcome:

B.Sc. (Hons.) Mathematics programme endeavor's to instil in students with a genuine interest in their subject area by fostering a creative spirit to help them fulfill their potential, to become creative mathematician. Upon completion of the B.Sc. (Hons) Mathematics programme, students will be able to

1. Develop deep interest in learning mathematics.
2. Familiar with different areas of Mathematics.
3. Develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.
4. Solve complex problems by critical understanding, analysis and synthesis.
5. Recognize and appreciate connections between theory and applications
6. Work effectively in a multi-disciplinary environment.
7. Get systematic understanding of application of the concepts and theories of mathematics in the real world-to an advanced level, and enhance career prospects in a huge array of fields

Program specific outcome: After completion these semesters students will be able :

1) Develop deep interest in learning mathematics.
2) Recognize and appreciate connections between theory and applications.

Part-1 (sem1 -sem2)

Courses outcomes

BMH: 101: Calculus

Outcomes

1. The student on completion of the course will be having knowledge of applications of calculus in various fields.

2. student will be able to evaluate the areas, volumes of Disks.
3. The student will be able to understand the basic theorems which will help in understanding analysis in coming years.

BMH-101(P): Calculus -l lab:

Outcomes

1. Students familiarize about Mathematical and its application to various field in Mathematics.

BMH-102: Algebra

Outcomes

1. On successful completion of the course the student will be having sound knowledge of solution of system of equations. The matrix theory will be known to the students.

BMH-201 Calculus -ll:

Outcomes

1. The students will be able to understand the concept of multivariate functions and vector analysis. The applications of these topics to projectile and torsion will be known to them

BMH-201(P) Calculus-II LAB:

Outcomes

1. Students familiarize about Mathematical and its application to various field in Mathematics.

BMH-204 Ordinary differential equations:

Outcomes

The student will be able to

1. Learn the solution of equations using differential equations.
2. The applications of differential equation in developing mathematical model will be known.

Part-2(sem3-sem4)

Courses outcomes:

BMH-301: Analysis-l:

Outcomes

1. To acquaint students with the fundamental properties like completeness of the real line.
2. To build up the concepts of size of sets and point set topology and to understand the proofs of theorems.
3. To give idea of sequences, subsequences, continuity and uniform continuity.

BMH-302: Linear algebra:

Outcomes

Students completing this course will be able

1. To have deep knowledge of vector space and its properties.
2. Moreover, students will be able to find the null space of a matrix and represent it as the span of independent vectors.
3. To find the matrix representation of a linear transformation given bases of the relevant vector space.

BMH-303: Mathematical methods:

Outcomes

This Course will enable the students to:

1. Orthogonal properties, recurrence relations of Legendre, Chebyshev and Bessel's differential equation.
2. Solve initial value problems using Laplace transform and integration of Laplace transforms.
3. of Fourier series, Fourier integrals, Fourier transforms

BMH-304: Probability and statistics: This Course will enable the students to:

1. Use the basic probability rules, including additive and multiplicative laws, using the terms independent and mutually exclusive events.

2. Explain the concepts of random variable, independent and jointly distributed random variables and conditional distributions, probability distribution, distribution function, expected value, variance and higher moments.
3. Calculate probabilities and derive the marginal and conditional distributions of bivariate random variables.
4. Define probability density function, moment generating function and use them to evaluate moments.
5. Define basic discrete and continuous distributions and be able to apply them

BMH-401: Analysis-ll:

1. To make the student proficient in the theory of functions of bounded variations and Rectifiable Curves.
2. To give insight of Riemann Steiltjes Integration and Convergence of both numerical Sequences and Sequences and Series of Functions.

BMH-402: Group theory -l: Upon successful completion of course students will

1. Have knowledge and skills to explain fundamental concepts of algebra such as groups, their properties and their role in modern mathematics.
2. Decide whether a given group is cyclic, and given a finite cyclic group, find a generator for a subgroup of a given order.
3. express a given finite cyclic group as the direct product of cyclic groups of prime power order and, given two direct products of cyclic groups, determine whether or not they are isomorphic

BMH-304: PDE and system of ODE: This Course will enable the students to:

1. The various techniques of finding solution of ordinary differential equations in more than two variables.
2. The idea of Lagrange's method for solving the first order PDE.
3. The origin of PDE and distinguish the integrals of first order linear PDE into complete, general and singular integrals.
4. Recognize the major classification of PDE and the qualitative difference between the classes of equations.
5. Be competent in solving PDE using classical solution methods.

6. Solving homogeneous heat, wave and Laplace equation.

BMH-404: Number Theory: This Course will enable the students to:

1. About some important results in the theory of numbers including divisibility, Fundamental theorem of arithmetic, Congruence's.
2. Familiarize with prime number theorem, Chinese remainder theorem, and Wilson's theorem.
3. About arithmetic functions, Mobius inversion formula, greatest integer functions.
4. Know about Primitive roots and indices, residues, Diophantine equations.
5. Solve related problems.

Part 3(sem5-sem6)

Courses outcomes:

BMH-501: Ring theory and linear algebra: The course will enable the students to

1. Learn basics of linear algebra and ring theory for further study in pure mathematics

BMH-502: Numerical methods: The course will enable the students to

1. Find the error analysis of numerical methods.
2. Appropriate numerical methods to solve algebraic and transcendental equations.
3. Understand the concept of numerical differentiation and numerical integration

BMH-502(P): **Numerical Methods lab using C++:** The objective of the course is to familiarize the students about different techniques for plotting e.g. solving algebraic and transcendental equations, differential equations, approximating functions by polynomials up to a given desired accuracy, finding approximate value of definite integrals of functions using programming in C++

BMH-503: Statistics and dynamics: The course will enable the students to

1. Learn the methods to solve various problems in mechanics.
2. Learn the concept of motion.

BMH-504: Linear programming: After the course completion the student will be able to

1. Learn various methods of solving diet problems, Production problems etc.
2. The students will learn the concept of transportation and assignment problems.

BMH-601: Metric space and complex analysis: The student will be able to

1. The concept of metric spaces.
2. Idea of open, closed sets will be clear.
3. Idea of complex functions and the concept of complex integration will be known to the students.

BMH-602: Tensor analysis: The students will be able to

1. Learn the basic concept of tensor.
2. Make coordinate free approach

BMH:603: Integral equations and integral transformation: The successful completion of course will help the student to

1. Have strong command over the subject.
2. Student will be able to apply various transforms in solving numerical problems.

BMH-604: DISCRETE MATHEMATICS AND GRAPH THEORY: The student will be able to

1. Learn the basic concept of graph theory.
2. The practical applications of the subject will be known to the student.
3. The student will be able to solve the difference equations using recurrence relations.

PG DEPARTMENT OF BOTANY

SESSION: 2023-2024

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (Cos) of the Programmes.

Programme Name: B.Sc Medical (Botany)

Program Outcomes

Bachelor of Science (BSc) offers theoretical as well as practical knowledge about different disciplines. These subject areas include Chemistry, Botany, Zoology and other fields depending on the specialisation a student.

The programme is also beneficial for students who wish to pursue multi and inter-disciplinary science careers in the future. Following are the outcomes of programme:

1. This programme forms the basis of science and comprises of the subjects like chemistry, botany, zoology.
2. It helps to develop scientific temper and thus can prove to be more beneficial for the society as the scientific developments can make a nation or society to grow at a rapid pace.
3. After the completion of this course, students have the option to go for higher studies i.e., M.Sc., PhD and then do research for the welfare of mankind.
4. After higher studies, students can join as scientist and can even look for professional job oriented courses.
5. This programme also offers opportunities for serving in Indian Army, Indian Navy and Indian Air Force as officers.
6. Students after this course have the option to join Indian Civil Services as IAS, IFS etc.
7. Science graduates can go to serve in industries or may opt for establishing their own industrial units.

Program Specific outcomes:

B.Sc. Medical

1. B.Sc. Medical student is able to acquire knowledge regarding Botany, Zoology, Chemistry, Biotechnology, Microbiology and Plant Taxonomy.
2. Medical Students will be able to define and explain major concepts in the biological sciences.
3. They are able to correctly use biological instrumentation and proper laboratory techniques.
4. Students will be able to communicate biological knowledge in oral and written form.

5. Students will be able to recognize the relationship between structure and function at all levels: molecular, cellular and organism.
6. They can go for Indian Forest Service and other competitive examinations.
7. They can opt for higher studies in Botany, Zoology, Chemistry, Biotechnology, Microbiology, Forensic science, Environment science etc.

BSc Medical (Botany)

Semester: I

Name of Paper: Microbes, Fungi and Algae Paper

code: BSc (BOT)-106 A

COURSE OUTCOMES

At the end of the Programme, the students will be able to:

1. Understand the Diversity among Microbes, Algae and Fungi.
2. Know the Systematics, Morphology and Life Cycle of Bacteria, Viruses, Fungi & Algae.
3. Become Familiar with the Interactions between different Groups of Organisms by studying Lichens and Mycorrhiza.
4. Acquire knowledge about the Economic Importance of Microbes, Fungi and Algae.

Name of Paper: Archegoniate

Paper code: BSc (BOT)-106 B

COURSE OUTCOMES

At the end of the Programme, the students will be able to:

1. Understand the Morphological Diversity, Anatomy, Life Cycle and Economic Importance of Bryophytes, Pteridophytes and Gymnosperms.
2. Identify the Bryophytes, Pteridophytes and Gymnosperms on the basis of their Morphological Structure and Anatomy.
3. Explain the types of Fossils and Geological Time Scale.

Semester II

Name of Paper: Plant Ecology

Paper code: BSc (BOT)-206 A

COURSE OUTCOMES

At the end of the Programme, the students will be able to:

1. Understand core concepts of ecology i.e., biotic and abiotic components.
2. Learn Classification of the various ecosystems on the basis of physical, chemical and biological components.

3. Know about the population and community characteristics.
4. Understand the various ecological adaptations in plants.
5. Understand the various biogeochemical cycles operating in nature.
6. Know about succession and its causes.

Name of Paper: Plant Taxonomy Paper

code: BSc (BOT)-206 B COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Classify Plants according to the systematics and will know the importance of herbarium and Virtual herbarium.
2. Evaluate the Important herbaria and botanical gardens.
3. Interpret the rules of ICBN in botanical nomenclature.
4. Assess terms and concepts related to Phylogenetic Systematics.
5. Generalize the characters of the families according to Bentham & Hooker's system of classification.

Semester III

Name of Paper: **Plant Anatomy**

Paper code: BSc (BOT)-306 A

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Identify and characterize various Tissue Systems.
2. Understand the Structure of Dicot and Monocot Root, Stem and Leaf.
3. Know the Normal and Anamolous Secondary Growth in Plants.

Name of Paper: Plant Embryology

Paper code: BSc (BOT)- 306 B

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Learn Structure and Development in Microsporangium and Megasporangium.
2. Learn the Process of Microsporogenesis and Megasporogenesis, Fertilization, Endosperm Types and their Development, and Embryogeny.
3. Know the mechanism of Fruit Formation and its Dispersal.

Skill Enhancement Course

Name of Paper: Mushroom Culture Technology

Paper code: SEC (BOT)-2.1

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Learn the History of mushroom cultivation, nutritional and medicinal value of mushroom, types of edible mushrooms, life cycle of *Agaricus* and *Pleurotus.*
2. Acquire knowledge of Mushroom spawn, laboratory and cultivation farm layout, equipments for mushroom spawn, cultivation of Paddy straw mushroom, White button and Oyster mushroom.
3. Know Disease management of mushroom, value addition and marketing of mushroom.

Name of Paper: Floriculture

Paper code: SEC (BOT)-2.2

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Learn the methods of Reproduction in Plants, Raising of Healthy Nurseries of Flowering and Ornamental Plants.
2. Know the role of Plant growth regulators in Nursery Management Practices.
3. Methods of long term and short term storage of value added products prepared from mushroom.
4. Marketing of products in India and abroad.

Semester IV

Name of Paper: **Plant Physiology**

COURSE OUTCOMES:

At the end of the Program, the students will be able to:

1. Learn and understand about the Importance of Water, Mineral Nutrition and Hormones in the Growth and Developmental processes in Plants.
2. Learn the process of Translocation of Solutes in Plants.
3. Understand various Types of Plant Movements and Plant Responses to Abiotic and Biotic Stresses.

Name of Paper: Plant Metabolism

Paper code: BSc (BOT)- 406 B

COURSE OUTCOMES:

At the end of the Program, the students will be able to:

1. Learn about the different Metabolites synthesized by Plants during the Process of Respiration and Photosynthesis.
2. Understand the Reduction- Oxidation Systems of Plants as well as Role of Enzymes in Metabolism.
3. Recognize the Different Metabolic Pathways of Nitrogen, Sulphur and Lipid, occurring in Plants.
4. Learn about the process and significance of Biological Nitrogen Fixation, Structure and Functions of Lipids and ß-oxidation of Fatty Acids.

Skill Enhancement Course Name of Paper: **Biofertilizers Paper code: SEC (BOT)-2.3 COURSE OUTCOMES:**

At the end of the Programme, the students will be able to:

1. Learn about the Different Categories of Biofertilizers, Sources of Biofertilizers.
2. Sources of Biofertilizers.
3. Know the advantages of the Organic Farming.
4. Vesicular Arbuscular Mycorrhiza (VAM) and its Influence on Growth and Yield of Crop Plants.
5. Organic Fertilizers and Biocompost Making.

Name of Paper: **Medicinal Botany**

Paper code: SEC (BOT)- 2.4 Course outcomes:

At the end of the Programme, the students will be able to:

1. Know about history and relevance of herbal drugs in Indian system of medicine.
2. Learn the macroscopic and microscopic characters, chemical constituents, and adulterants, therapeutical and pharmaceutical uses of medicinal plants.
3. Understand the techniques for drug evaluation (Chemical, Physical and Biological), Phytochemical investigations, standardization and quality control of herbal drugs.
4. Know the technique of medicinal gardening - Cultivation practices, marketing and utilization of selected medicinal plants.

Semester V

Name of Paper: **Cell Biology Paper**

code: BSc (BOT)- 505 A

Course outcomes:

On completion of the course, students are able to:

1. Understand the structures and basic components of prokaryotic and eukaryotic cells, membranes and cell organelles.
2. Acquire knowledge about the structure of chromosomes and role of cellular components in mitotic and meiotic cell division.
3. Structure and functions of Special Chromosomes (Lampbrush and Polytene).
4. Nucleosome model and DNA packagingin prokaryotes and eukaryotes.

Name of Paper: Molecular Biology

Paper code: BSc (BOT)-505 B

COURSE OUTCOMES:

At the end of the Program, the students will be able to:

1. Know the role of DNA and RNA as the genetic material of a cell.
2. Learn the mechanism of different processes such as replication, transcription, translation and their regulation.
3. Know the structure and regulation of Lac operon and tryptophan operon.
4. Gene regulation in Eukaryotes.

Name of Paper: Analytical Techniques in Plant Sciences – Part I Paper

code: BSc (BOT)-506A

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Know the Laboratory Safety Protocols, Physical and Biological Hazards and their Disposal.
2. Learn the Basic analytical techniques of microscopy, staining and fixation.
3. Know the Histochemical techniques and methods of localizing different macromolecules.
4. Know the types of Fixatives, Stains and Staining Techniques for bacteria(Gram staining).
5. Understand the Histochemical localization of carbohydrates, nucleic acids, lipids and proteins.

Name of Paper: Analytical Techniques in Plant Sciences – Part II Paper

code: BSc (BOT)-506 B

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Know the Operating procedure and applications of chromatography and electrophoresis.
2. Know the Blotting techniques (Southern blotting, Northern blotting, Western Blotting), Polymerase Chain Reaction (PCR), its types and DNA fingerprinting.
3. Understand the Techniques of centrifugation, spectroscopy, and immunotechniques.
4. Learn the Procedure and Applications of centrifugation.

Skill Enhancement Course

Name of Paper: Plant Diversity and Human Welfare Paper

code: SEC (BOT)- 3.1

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Learn the concept of biodiversity, its various types and as well as methods of conservation of biodiversity.
2. Know various national or international level organizations working for the management of Biodiversity.
3. Understand Products obtained from forests.
4. Know categories and importance of forest products, avenue and ornamental trees.

Name of Paper: Herbal Technology Paper

code: SEC (BOT)-3.2 COURSE

OBJECTIVES:

At the end of the Programme, the students will be able to:

1. Understand the History and Role of medicinal plants in Siddha systems of medicine.
2. Know the Role of medicinal plants and their systematic position.
3. Understand the Methods for the identification and active principles of herbs, and to evaluate the drug adulteration.
4. Know about Drug Evaluation and Biological Testing of Herbal Drugs.

Semester VI

Name of Paper: Economic Botany

Paper code: BSc (BOT)-605 A

COURSE OUTCOMES:

At the end of the Program, the students will be able to:

1. Understand about the cultivation practice use and values of various food crops and fibers.
2. Get knowledge about the plant part used and active principle and uses of active principles present in medicinal plants.
3. Learn the usage of various spices, beverages and oil yielding plants.
4. Know about the cultivation, processing and uses of rubber and Tobacco.

Name of Paper: Biotechnology Paper

code: BSc (BOT)- 605 B

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Learn the various aspects of biotechnology such as the role of DNA markers, restriction enzymes and Recombinant DNA techniques.
2. Know methods of gene cloning and role of cloning vectors in cloning methods.
3. Learn techniques involved in the gene transfer.
4. Learn methods of plant tissue culture, and preparation of artificial seeds.

Name of Paper: Research Methodology- Part I Paper

code: BSc(BOT)-606 A

COURSE OUTCOMES:

At the end of the Programme, students will be able to:

1. Understand the basic concept and methods to carry out research related to the biological field.
2. Learn the Importance of General Laboratory Practices like labelling of reagent bottles, preparation of solutions and handling of micropipettes.
3. Know the methods used in the documentation of observations and art of field photography.
4. Understand the Genomics and Proteomics.

Name of Paper: Research Methodology- Part II

Paper code: BSc (BOT)-606 B

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Understand the technique and methods involved in the preparation of herbarium and to study plant structure.
2. Know the formulas used in the descriptive statistics and their importance in research.
3. Learn significance of Research Ethics and a good scientific paper
4. Know about the Power point presentation and academic misconduct/plagiarism.

Skill Enhancement Course

Name of Paper: Intellectual Property Rights Paper

code: SEC(BOT)- 3.3

COURSE OUTCOMES:

At the end of the Programme, the students will be able to:

1. Learn History and kinds of IPR in India and the world.
2. Learn difference between the patent, copyright and trademark.
3. Learn Protection of traditional knowledge and role of acts in plant variety and biotechnology protection.

Name of Paper: Nursery and Gardening Paper

code: SEC (BOT)- 3.4

COURSE OBJECTIVES:

At the end of the Programme, the students will be able to:

1. Understand the Nursery planning.
2. Understand the Role of vegetative propagation and its different types in the establishment of nursery.
3. Know the different components and types of gardening techniques.
4. Know about the Factors affecting seed viability.
5. Learn the Importance of seed bank and its types.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF ZOOLOGY

SESSION: 2023-2024

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (Cos) of the Programmes.

Program Name: B.Sc. Medical (Zoology)

PROGRAM SPECIFIC OUTCOME

1. Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms.
2. Analyse complex interactions among the various animals of different phyla, their distribution and their relationship with the environment.
3. Apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
4. Understands the complex evolutionary processes and behaviour of animals.
5. Correlates the physiological processes of animals and relationship of organ systems.
6. Understands about various concepts of genetics and its importance in human health
7. Apply the knowledge and understanding of Zoology to one's own life and work
8. Develops empathy and love towards the animals

COURSE SPECIFIC OUTCOME
B.Sc. Medical (Zoology)

Class / Semester	Course Title	Course Objectives	Course Outcomes
B.Sc. Medical / Ist	Animal Diversity – I	To understand the animal kingdom, their taxonomic position, their general characteristics, body organization of different phylum, origin and evolutionary relationship of different phylum.	Student should be able to describe unique characters of different phylum, student should be able to recognize life functions, recognise the ecological role, and recognise the diversity.
	Animal Diversity – II		
B.Sc. Medical / IInd	Comparative Anatomy of	Comparative Vertebrate Anatomy examines the	Several critical Learning Outcomes are sought in this

	Vertebrates	evolutionary history of vertebrate morphology with a primary focus on structure-function relationships. Lectures will trace the evolutionary origin of vertebrates through the vast diversity of animals living today. Emphasis will be placed on the analysis of similarities and differences across groups using systems based approach to assess the significance of adaptations.	course. Students will learn how to use the comparative method to analyze and critically evaluate the structure and function of vertebrate systems. This course will enable them to examine the evolutionary history of vertebrate species and assess the functional significance of morphological adaptations.
	Comparative Developmental Biology of Vertebrates	This course compares and contrasts embryos of different species, showing how all animals are related. They pass from single cells to multi-celled zygotes, clumps of cells and hollow balls of cells, before they differentiate, creating the organs and systems of the body. All have a set of very similar genes that define their basic body plan. As they grow, the differences that will distinguish the embryos as adults become more and more apparent. The study of this development can yield insights into the process of evolution.	Students who successfully complete this course will be able to: Outline and compare the developmental stages which occur in a variety of animal phyla. Explain the mechanisms which lead to cell determination. Describe the evolutionary conservation of developmental mechanisms. Generate a hypothesis from a set of observations and then design experiments to test the hypothesis.
B.Sc. Medical / IIIrd	Animal Physiology	Students are taught the detailed concepts of digestion respiration excretion the functioning of	Students who successfully complete this course will be able to:

		nerves and muscles. Students gain fundamental knowledge of animal physiology. Students will gain skill to execute the roles of a biology teacher or medical lab technicians with training as they have basic fundamentals	Describe the function and structure of cells. Identify and distinguish between tissues in the animal body. Explain the structure and function of organ systems in the animal body.
	Ecology and Biochemistry	This course is designed to develop an ecological intuition based on rules of thumb, approximations, and a deep understanding of the processes and interactions that lead to ecological patterns. In biochemistry, the chemical nature of biological macromolecules, their three-dimensional construction, and the principles of molecular recognition are included to help the learners in understanding basic biochemical process inside the animal body.	Students who successfully complete this course will be able to: Describe animal distribution patterns in relation to abiotic and biotic factors. Define the essential characteristics underlying natural ecosystems. Can understand the biochemical processes of animal world. Can define the underlying processes in metabolic pathways.
B.Sc. Medical / IIIrd, IVth, Vth, VIth (Skill Enhancement Courses)	Economic Entomology	To have a deeper understanding of several aspects of the biology of insects. To appreciate the impact that insects have (both positive and negative) on human society, including human health, agriculture, and the environment.	Students who successfully complete this course will be able to: Describe the importance of beneficial and pest insects to humans. Match inset morphology with their ecological function. Outline the classification and

			major evolutionary trends among the insect orders. Properly mount and preserve insect specimens. Identify insect orders and important families.
	Aquaculture	Course provides them comprehensive understanding about aquatic ecosystem and various economical important fishes. Students gain knowledge in the areas of responses characterization and classification, knowledge of integumentary system.	After completing the course the students should have a thorough understanding of biological challenges related to aquaculture and production planning, design and management of aquaculture farms, fish health, genetics and breeding, and international aquaculture.
	Medical Diagnostics	This paper imparts the required skills for the detection of diseases, operation and application of various advance techniques.	After the exposure of the current paper students would find themselves equipped with a full package of skill development in order to work in an advance diagnostic setting.
	Research Methodology	Understanding of scientific method, concepts and steps in research, Differentiate between the Quantitative and Qualitative Research and understand different types of Research Design, Understand the various techniques of Data Collection-Observation, Questionnaire, Interview Schedule; Case Study, Social Survey, Content Analysis,	Upon completing this course, each student will be able to: demonstrate knowledge of research processes (reading, evaluating, and developing); identify, explain, compare, and prepare the key elements of a research proposal/report; describe sampling methods, measurement scales and instruments, and appropriate uses of each.

		Describing various types of Sampling, Elaborate on Data Processing and Data Analysis	
B.Sc. Medical / IVth	Genetics	The course is designed to make students familiar with the Mendelian and non Mendelian inheritance, Concept behind genetic disorder, gene mutations-various causes associated with inborn errors of metabolism.	Upon successful completion, students will have the knowledge and skills to: Explain the key concepts in genetics including: the basis of genetic variation; heritability; Hardy-Weinberg Equilibrium; roles of migration, mutation.
	Evolutionary Biology	The aim of the course is to provide students with a deeper insight into the evolutionary processes - both selective and random - which can explain the genetic composition of populations, form, behaviour and distribution of organisms, and to teach students the basic methods of analysing the evolutionary relationships among animals.	After completion of the course, a student should be able to: understand and explain the main forces of evolution (natural selection, sexual selection, genetic drift) and the interplay among them, both over ecological and evolutionary time, generate evolutionary hypotheses for a wide variety of biological phenomena.
B.Sc. Medical / Vth	Animal Biotechnology	The course is designed to explain Definitions and scope of Animal biotechnology Activities of Animal biotechnology	Students will be able to describe the structure of animal genes and genomes. Be able to describe how genes are expressed and what regulatory mechanisms contribute to control of gene expression. Be able to describe basic principles and techniques in genetic

			manipulation and genetic engineering
	Reproctive biology	The major objective of this course is to provide students with a sound coverage of reproductive biology. This is achieved by first covering fundamentals of the structure and function of the male and female reproductive tracts, gametogenesis, fertilization, early embryogenesis, fetal development and preparation for birth, and maternal adaptations to pregnancy.	At the completion of this unit students should be able to: Scientific principles and general biology. Describe the reproductive system of animals. Describe how medical treatment of perinatal loss has changed over time and the reasons behind the changes.
B.Sc. Medical / VIth	Immunology	The course is designed to discuss normal functions of body components during immune responses, to explain adverse functions of these cellular and molecular components during abnormal circumstances. Course also describes mechanisms of diseases associated with adverse functions of the immune system.	Students who successfully complete this course will be able to: Identify major components of the immune system at organ, cellular and molecular levels. Elucidate the relationship between major cellular and molecular components of immune system. Apply immunologic techniques to solve certain clinical and research problems.
	Parasitology	To study and understand the scope of parasitology. To aware the students for various parasites and diseases which spreads in human with the help of study of	Students who successfully complete this course will be able to: Explain basics of the parasitic life-mode in context of ecological and

		host-parasite relationship. To increase awareness for the health in students. To understand the various disease causing vectors like Mosquitoes. To aware about the typhoid, cholera like disease.	evolutionary forces. Apply basic physiological, evolutionary and ecological concepts to parasitic relationships. Identify major parasitic groups, and describe their key characteristics. Describe the impact of parasitic infections on human health and history. Explain medical and public health aspects of human parasitic infections.
Compulsory Course for Undergraduate Classes	Drug Abuse	This course is designed with the objective to provide students a deep knowledge about drug abuse and harmful effects on human, society and overall life. Also symptoms and cure strategies of the drug addicts was also explained.	Upon completion of this course, the students should be able to: Differentiate between a social users, substance abuser and addict. Explain the differences between physical and psychological dependence. Identify the various sources of drugs Recognize various oral conditions that may be present with chronic nicotine, alcohol, prescription medication and/or illegal drug use.

P.G Department of English

Session:2023-24

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: B.A. Honours School in English

Programme Outcomes (PO):

At the end of the programme the students will be able to

1. To understand the theme, structure and style of British poetry and drama.
2. To develop a skill to appreciate British poetry.
3. They would have understood the socio-political context of the period from 14th to 17th century.

Programme Specific Outcome (PSO):

1. At the end of the programme the students will be able to ounderstand the theme, structure and style of British poetry and drama.
2. To develop a skill to appreciate British poetry.

BHE 101: CORE PAPER I

BRITISH POETRY AND DRAMA: 14TH TO 16TH

Course Outcome (CO):

At the end of the programme the students will be able to

1. To understand the theme, structure and style of British poetry and drama.
2. To develop a skill to appreciate British poetry.

BHE 102: CORE PAPER II

BRITISH POETRY AND DRAMA: 17th AND 18th CENTURY

Course Outcome (CO):

1. Students will be able to understand the British poetry and drama in detail. =
2. They would have grasped the major theme of satiric poems that belong to 17th-18th century.
3. They will understand the two significant weapons of satire i.e. irony and humour.

BHE 104-

MEDIA AND COMMUNICATION SKILLS

Course Outcome (CO):

1. The students will be able to understand the importance of media in communication processes.
2. It will create the social awareness among students.

SEMESTER- II

BHE 201: CORE PAPER III

BRITISH LITERATURE (PROSE AND FICTION): 18TH CENTURY

Course Outcome (CO):

1. Students will be learnt of appreciate the literary works through great writers.
2. They will understand the selection of human being with literature.
3. They will be able to appreciate literariness embedded into the text.
4. They would have gained insight into the growth and development of British literature.

BHE 202: CORE PAPER IV

INDIAN WRITING IN ENGLISH

Course Outcome (CO):

1. It will help the students to understand the various features of Indian literature in English.
2. To get a glimpse of the regional literatures translated in English.
3. To make the students aware of the superstitious practices prevalent in Indian society.
4. Students have understood how well the Indian culture is reflected in literature.

BHE 203: GENERIC ELECTIVE (GE II) ACADEMIC WRITING ANDCOMPOSITION

Course Outcome (CO):

1. Students will be able to compose, edit and design the information.
2. They will be able to appreciate the beauty of language.

SEMESTER III

BHE 301: CORE-V

BRITISH ROMANTIC LITERATURE

Course Outcome (CO):

1. It aims to acquaint the students with Romantic Period and some of its representative writers.

2. Students will understand the difference between reason and imagination, literature and revolution.

BHE 302: CORE-VI

BRITISH LITERATURE: 19th CENTURY

Course Outcome (CO):

1. To expose the students to the literature produced in Britain in the 19th century.
2. To enable the students to understand the existing conflict between faith and doubt in Victorian society.

BHE 303: CORE-VII

WOMEN'S WRITINGS

Course Outcome (CO):

1. To acquaint the students with the complex and multifaceted literature by women of the world.
2. Students will understand different forms of literature: poetry, fiction and short fiction.

BHE 304: SEC-I Soft Skills

Course Outcome (CO):

1. To make the students communicate without being hesitant and ask for help and support when necessary.

BHE 305: GE-III

Gender and Human Rights

Course Outcome (CO):

1. To develop a basic understanding of human rights and create awareness regarding fundamental rights provided by the constitution of India.

SEMESTER IV

BHE 401: CORE-VIII BRITISH LITERATURE: EARLY 20th

Course Outcome (CO):

1. To familiarize the students with new literature of Britain produced in the early decades of 20th century.
2. Students will also understand innovative techniques introduced by the writers of the 20th century.

BHE 402: CORE-IX

INDIAN CLASSICALLITERATURE

Course Outcome (CO):

1. To introduce students to the major works of Indian classical dramatists.
2. To enable the students to appreciate Indian classical literature and to realize its value in practical aspects of life.

BHE 403: CORE-X

AMERICAN LITERATURE

Course Outcome (CO):

1. To provide a glimpse into social realism and American folklore and novel.
2. To develop a skill to appreciate American poetry.

BHE 404: SEC-II

BUSINESS COMMUNICATION

Course Outcome (CO):

1. To understand and demonstrate writing and speaking processes through invention, organization, drafting, revision, editing and presentation.

BHE 405: GE-IV

LANGUAGE, LITERATURE AND CULTURE

Course Outcome (CO):

1. To enable the students to apply theoretical knowledge into practice and to familiarize them with various aspects of language, literature and culture.

SEMESTER V

Modern British Fiction

Course Outcomes (CO):

1. To enable the students to learn about modern British culture and society.

Modern Drama

Course Outcomes (CO):

1. Inculcates in students understanding of Modern Era**.**

American Literature

Course Outcomes:

1. An American Literature program emphasizes critical analysis of diverse texts and cultivates effective communication skills, preparing students to appreciate historical contexts and contribute to independent research within the field.

LITERARY CRITICISM

Course Outcome (CO):

1. Literary criticism serves an illuminating purpose by making the students appreciate the beauty of great literature. They learn to understand political and social conditions described in works of literature. This course aims to develop students' ability to understand and criticize a literary piece. The course equips themwith knowledge of key forms and terminology of literary criticism.

PSYCHOLOGY

Course Outcome (CO):

1. The aim of the paper is to introduce students to the elementary aspects of psychology. It enables the students to deal with characters in texts,their perception of the world, miseries, desires, conflicts, individual and social concerns. Psychology also provides insight into literature by exploring mental processes.

SEMESTER VI

20th Century Fiction

Course Outcomes (CO):

1. Master 20th-century fiction, analyze critically, understand historical contexts, and express insights effectively

Modern English Poetry

Course Outcomes (CO):

1. Graduates should be able to engage in thoughtful discussions, produce insightful analyses, and demonstrate a creative and critical approach to contemporary poetic expression.

20th Century Drama

Course Outcomes (CO):

1. A 20th-century drama program aims to provide students with a comprehensive understanding of the evolution of dramatic literature throughout the 20th century. Program outcomes may include the ability to analyze and interpret significant works, explore diverse theatrical movements and styles, and comprehend the social and cultural contexts that influenced 20th-century drama. Graduates should demonstrate proficiency in critically evaluating dramatic texts, understanding theatrical innovations, and articulating informed perspectives on the contributions of various playwrights to the 20th-century dramatic canon.

LITERARY CRITICISM

Course Outcome (CO):

1. Literary criticism serves an illuminating purpose by making the students appreciate the beauty of great literature. They learn to understand political and social conditions described in works of literature. This course aims to develop students' ability to understand and criticize a literary piece. The course equips themwith knowledge of key forms and terminology of literary criticism.

PSYCHOLOGY

Course Outcome (CO):

1. The aim of the paper is to introduce students to the elementary aspects of psychology. It enables the students to deal with characters in texts,their perception of the world, miseries, desires, conflicts, individual and social concerns. Psychology also provides insight into literature by exploring mental processes.

B.A. Part-I (Semester-I)

BA (ENG)-102 English (Communication Skills)

Course Outcome (CO):

1. The chief objective of the paper is to sharpen the literary and grammar skills of the students. Selected short stories and poems have been incorporated in the syllabus to give impetus to creativity and imagination of the students. The syllabi will also help the students to understand the nuances of English language & usage.

B.A. Part-I (Semester-II)

BA (ENG)-202 English (Communication Skills)

Course Outcome (CO):

1. The chief objective of the paper is to sharpen the literary and grammar skills of the students. Selected short stories and poems have been incorporated in the syllabus to give impetus to creativity and imagination of the students. The syllabi will also help the students to understand the nuances of English language & usage.

B.A. Part-II (Semester-III)

BA (ENG)-302 English (Communication Skills)

Course Outcomes (CO):

1. The chief objective of the paper is to sharpen the literary as well as grammar skills of the students. To give wings to the imagination of the students a book of selected short stories has been prescribed. Besides, to make the students understand the nuances of English language & usage a grammar book has also been incorporated.

B.A. Part-II (Semester-IV)

BA (ENG)-402 English (Communication Skills)

Course Outcomes (CO):

1. The objective of the paper is to develop the empathy, compassion and the determination in the students through the study of classical literary work Oliver Twist. It further aims at enriching the communicative skills of the students to facilitate their exchange of ideas. The paper will also help the students in improving their written skills.

B.A. Part-III (Semester-V) BA (ENG)-502 English (Communication Skills)

Course Outcomes (CO):

1. The objective of the paper is to develop the critical thinking of the students through the study of modern drama. This paper also aims at honing the writing skills of the students. More emphasis is laid on the composition part to enrich the vocabulary, imagination and literary expressions of the students.

B.A. Part-III (Semester-VI)

BA (ENG)-602 English (Communication Skills)

Course Outcomes (CO):

1. The objective of this paper is to enhance the interest of the students in various poetic forms through the study of prominent poems. This paper will also help in sharpening the writing skills and enrich the critical and textual knowledge of the students.

B.A. Part-I (Semester-I)

BA (ENL)-104 English Literature An Introduction to the Study of Literature: Part 1

Course Outcomes (CO):

1. The objective of the paper is to introduce the students to the field of literature. The students shall learn the importance of literature, how it influences the society and vice-versa. At the entry level, the students will be introduced to the common literary terms, genres, captivating stories.

B.A. Part-I (Semester-II)

BA (ENL)-204 English Literature An Introduction to the Study of Literature: Part 2

Course Outcomes (CO):

1. The objective of the paper is to ignite the imaginative faculty of the students through the study of poetry and novel. The curriculum prescribed in this paper will enable the students to understand the fundamental concepts relating to poetry and fiction. It will also develop an inclination of the students towards literature.

B.A. Part-II (Semester-III)

BA (ENL)-304 English Literature English Literature from Chaucer to the Eighteenth Century

Course Outcomes (CO):

- The objective of the paper is to introduce the students to literary terms, prominent texts and literary characteristics of different ages. The study of the texts prescribed will develop the understanding of the students regarding the socio-culture, socio-political and socio-economic aspects of different eras.

B.A. Part-II (Semester-IV)

BA (ENL)-404 English Literature

Literary Masterpieces: Study of the Classics - I

Course Outcomes (CO):

1. The objective of teaching this paper is to introduce the students with the Literary Masterpieces. Although the literary world is enormous and it is impossible to cover the masterpieces under one entire paper, yet an attempt has been made for fostering literary acumen among the students by including some celebrated literary masterpieces in this paper.

B.A. Part-III (Semester-V)

BA (ENL)-504 English Literature Poetry and the History of English Literature

Course Outcomes (CO):

1. The main objective of this paper is to enhance the interest of students in literature and particularly to inculcate the basic understanding of various types of poetic forms. Through the curriculum of this paper, an effort is also made to acquaint the students with the history of English Literature. In addition, the students will have to study some prominent texts to ameliorate their literary skills.

B.A. Part-III (Semester-VI)

BA (ENL)-604 English Literature

Masterpieces: Study of Classics-II

Course Outcomes (CO):

- The objective of teaching this paper is to introduce the students with the Literary Masterpieces. Although the literary world is vast and it is impossible to cover the masterpieces in one paper, yet an attempt has been made for fostering literary sensibility among the students by including some celebrated literary masterpieces in this paper.

PG Department of Punjabi

Session: 2023-24

Under Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: BA

Course Name: Punjabi

Programme Specific Outcomes

B.A. Punjabi is an undergraduate program that envelops the study of topics such as Poetry, Modern Punjabi Story, Punjabi Sufi-Poetry, Old and Modern Punjabi Folklore and culture, Punjabi Literature, Punjabi Criticism and Western Literary Approaches etc.

Those candidate who are interested in Punjabi in Punjabi language and its related fields etc. most appropriate for this course and also those who are willing to go for teaching fields at higher degree level both in private colleges or government institutions.

This program empowers the candidate to go for a wide variety of Punjabi jobs of an interpreter or translator which may be of various sorts, for example general interpreting consecutive interpreting and liaison interpreting. Most of translator works in an assortment of fields, which on corporate specialized logical abstract, technical skier literary or business.

Bachelor of Arts (B.A) Punjabi is the specialization or primary concentration of one degree. Punjabi is the study and philosophy of the Punjabi language. Subjects typically study Drama, Poetry, Fiction, Literary, History and criticism etc. under BA Punjabi Course structure.

Course Outcomes

B.A. course has major emphasis is given on its social aspects, origin, literature, grammar, etc. alongside that how its literature, grammar, etc. alongside that how its literature created with the commitment of numerous contemporary scholars, artists, vocalists and by other cultural loving people.

Punjabi Compulsory (B.A.I, II, III)

The main purpose of this course is to equip the students with the nuances of the Punjabi language which includes proficiency in grammar and it s effective usage in speaking and writing. It further helps them to prepare for various competitive exams and to keep up with the increasing demand for Punjabi in Punjab society and at the global level.

Punjabi Elective (B.A.-I, II, III)

This subject expands the knowledge of the students about the major writers and their works in Punjabi literature. It equips them to compose sophisticated written works in various areas ofliterature along with the usage of literary devices. It also prepares them for postgraduate programs such as M.A. Punjabi.

PG Department of History

Session 2023-24

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (Cos) of the Programmes.

Programme Name: B.A

Course Name: HISTORY

B.A (HISTORY) SEM Ist

Subject Name: HISTORY OF INDIA UPTO 1000 A.D

1. To introduce the students about Ancient Indian history.
2. Students can learn about Art, Culture and Social life of India.

B.A (HISTORY) SEM IInd

Subject Name: HISTORY OF INDIA 1000-1707 A.D

1. To introduce the students to the history of Medieval India History.

B.A (HISTORY) SEM IIIrd

Subject Name: HISTORY OF INDIA 1707-1950 A.D

1. To introduce the students about history of India.
2. Students can read about decline of Mughal empire and rise and expansion of Maratha Power
3. To introduce the students about British history in India.

B.A (HISTORY) SEM IVth

Subject Name: HISTORY OF PUNJAB 1469-1799 A.D

1. To introduce the students about history of Sikhs from 1469 to 1799 AD
2. Students can learn about Martyrdom of Sri Guru Teg Bahadur ji, and History of Guru Gobind Singh ji.

B.A (HISTORY) SEM Vth

Subject Name: HISTORY OF WORLD 1500-1950 A.D

1. To introduce the students about world history.
2. Students can learn about the changes in social activities which occurred in between the time of (1500-1815 AD).
3. To introduce the students about world history of 19th century

B.A (HISTORY) SEM VIth

Subject Name: HISTORY OF PUNJAB 1799-1966A.D

1. To introduce the students about history of Sikhs from 1799 to 1849 AD.
2. Students can read about empire of Maharaja Ranjit Singh and about annexation of Punjab.
3. To introduce the students about history of Sikhs from 1849-1947 AD.
4. Students can read about Partition of Punjab and Re-organisation of Punjab.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF POLITICAL SCIENCE

Session: 2023-24

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: BA

Course Name: Political Science

Program Outcome:-

- To acquaint a student with conventional as well as contemporary areas in the discipline of Political Science.
- To enable a student well versed in national as well as international trends.
- To enable the students for conducting politics and law related practices, role of regulatory bodies in political and international sectors, nature of various political institutions.
- To provide in-depth understanding of all core areas specifically advanced national, international politics, emerging trends, recent theories, research methodology and global politics.

Program Specific Outcome:-

After the completion of the Bachelor's course, a student is able

- For teaching in schools after qualifying requisite tests.
- For working or participating in political institutions, political groups and international political sector.
- For pursuing further studies in the field of state, national and international politics.

Course Outcome:-

BA (POL)-114 –Political Theory-1

- Students can easily understand the ideologies and environment of political leadership.

BA (POL)-214 –Political Theory-2

- Students can easily understand the ideologies and environment of political leadership.

BA (POL)-314 –Indian Political System-1

- The paper will provide students a fundamental understanding of working of Indian government in the backdrop of the critical constitutional debates.

BA (POL)-414 –Indian Political System-2

- The paper will provide students a fundamental understanding of the working of the Indian political system with reference to political parties, the party system, elections and voting behavior in the backdrop of the critical constitutional debates.

BA (POL)-514 –Comparative Political System (UK AND USA)

- This paper will acquaint the students with cross cultural and cross national political systems.

BA (POL)-614 –International Politics: Theory and Practice

- The paper will provide students an understanding of key theories and issues in international politics.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF ECONOMICS

SESSION: 2023-24

Under Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: BA

Course Name: Economics (Elective)

PROGRAMME OUTCOMES

1. Students after completing the BA in Economics programme is supposed to show proficiency in academic, professional, soft skills and employability required for higher education and placements
2. They also have the ability to use established techniques of analysis and enquiry within the areas of study.
3. The graduates in Economics will be capable to understand the concepts and processes related to this field of study.
4. the Graduates are able to recognize the importance of social, environmental, human and other critical issues faced by humanity at the local, national and international level
5. A graduate in Economics is capable to demonstrate independent learning, analytical and critical thinking of a wide range of ideas and complex problems and issues.

PROGRAMME SPECIFIC OUTCOMES

1. Understand the relation/conflict between economic growth & environmental problems as well as economic growth & Social inequality.
2. Have the idea of government economic policies both at national & international level.
3. Ability Comprehend and evaluate economic policies at various levels.
4. Ability to understand Financial Markets & its working
5. Develop analytical ability and other cognitive skills.

COURSE OUTCOMES

SEMESTER - I

ECO-106: Micro-Economic and Indian Economy – I

Outcomes

1. Identify appropriate economic models (e.g., models of perfectly competitive markets and various market imperfections) and apply them to analyze and predict the behavior of individuals and firms interacting in markets.
2. Students understand factual information on Indian economy.
3. They analyze spectral performance of the economy

SEMESTER – II

ECO-206: Micro-Economic and Indian Economy – II

Outcomes

1. Acquire basic toolkit from game theory; develop skills in the translation of economic problems into game-theoretic framework; be able to select an appropriate solution concept
2. They compare and evaluate the growth and development trends of the national as well as regional economies

SEMESTER – III

ECO-306: Macro- Economics and Public Finance- I

Outcomes

1. Grasping the effectiveness of fiscal and monetary policies under different exchanges rate regimes through Mundell-Fleming model.
2. Able to understand the need for government in the economy and different explanations for it.
3. The students are expected to combine the understanding of the data and policies to organize critical examination of the growth process

SEMESTER – IV

ECO-406: Money & Banking and International Economics-II

Outcomes

1. To enhance the analytical skills of the student towards understanding the developments in the economy.
2. To introduce the student to the art of abstracting and building small models related to the macroeconomics.
3. Understand basis of gainful trade between countries
4. The students will be introduced the models of international trade

SEMESTER – V

ECO-506: Economics of Development and Basic Quantitative Methods-I

Outcomes

1. Identify problems faced by developing countries and suggest suitable policies for tackling them.
2. To improve the basic mathematical skills of the students by familiarizing them with Set Theory and for economic decision-making.
3. To Acquire applied knowledge of Matrices and determinants

SEMESTER – VI

ECO-606: Economics of Development and Basic Quantitative Methods-II

Outcomes

1. Evaluate the role of institutions in economic growth.
2. Analyze the performance of Trade liberalization policies and their effects on human deprivation in developing economies.
3. To Acquire applied knowledge of Matrices and determinants

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

PG DEPARTMENT OF COMMERCE

SESSION: 2023-2024

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and CourseOutcomes (Cos) of the Programmes.

Programme Name: B.Com (Honours)

B.Com with Honours is similar to the B.Com degree when it comes to the subjects. This is also a3-year degree course that is easily available in most recognized universities and colleges. This degree is a great stepping for further education, especially if one wants to do professional courses like CA, CS. Students who wants a career in different industries like teaching, journalism, communications, design, etc. go for B.Com (H).

Nature and Objective of Programme:

1. Develop an understanding of commerce and apply the skills and knowledge in a business organization.
2. Equip the graduates with the know-how of operating successfully in a continuously changing business environment.
3. Equip graduates with the skills required to lead management decisions.
4. Make informed and ethical decisions based on thorough knowledge of commerceconcepts.

Programme Outcomes:

1. Deep Understanding of Accounting Issues Related to Business.
2. Understanding of General Business Functions Impacting Organization.
3. Interpersonal and Communication Skills.
4. Understanding Ethical, Social Sustainable Business Issues.
5. Developing Entrepreneurship Acumen.

Programme Specification Outcomes

1. Demonstrate ability to interpret and analyze financial statements.
2. Understanding the rules and regulation laid down by Accounting Body.
3. Demonstrate ability to understand Compliance as per various enactment.
4. Acquiring conceptual clarity of various functions and ability to analyze.

5. Various Functional issues demonstrating ability to evolve strategies for business.
6. Demonstrate effectively oral and written Communication.
7. Demonstrate Ability to work in Groups. Exhibit skills like Empathy, EQ.
8. Managerial and Inter-Personnel skills
9. Demonstrate understanding of social cues and contexts in social interaction.
10. Develop Ethical practices and Imbibe values for better corporate governance.
11. Understand Ethical challenges and choices in a business setting demonstrateunderstanding of sustainability related concerns in varied areas
12. Understand the ecosystem of start up in the country.
13. Demonstrate the ability to create business plans.
14. Students will demonstrate progressive effective domain development of values, the roleof Accounting in society and business Learner will get ability to clear exams like CA, CS, ICWA and others.

Course Outcomes:

Semester I

BC/ BBA 1.1 Environmental and Road Safety Awareness

Creating awareness regarding Environmental and Road Safety issues.

BCH 1.2 Financial Accounting

Developing basic skills to maintain Accounts

BCH 1.3 Business Laws

To provide knowledge of Contract Act to students

BCH 1.4 Micro Economics

Basics of Micro level Economics, Concepts, Theories and Applications in business

BCH 1.5/ 1.5 A Punjabi/ Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence

Semester-II

BCH 2.1 Business Communication Skills

To develop effective communication skills and methods of preparing various types of Business correspondence

BCH 2.2 Corporate Law

To impart knowledge of Company regulations.

BCH 2.3 Management Principles and Applications

To understand basic Management Concepts and principles for better understanding.

BCH 2.4 Macro Economics

Introducing with various issues of Macro level economics, Theories and important functionsof Consumption, Investment

BCH 2.5/ 2.5A Punjabi/ Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence

Semester-III

BCH 3.1 Human Resource Management

Developing Knowledge of different aspects of Human Resource and its Management

BCH 3.2 Income Tax Law and Practice

Basic knowledge of Residential Status, Different Heads of Income Deductions and Computation of Tax

BCH 3.3 Corporate Accounting

Develop the skill of Preparation of Accounts of Various Companies and getting job opportunities in corporate world

BCH 3.4 Business Statistics

To make aware of statistical tools for analysis of quantitative data

BCH 3.5 E-Commerce

Understanding of Electronic usage in Business activities

BCH 3.6 Seminar

To enhance the educational and communication skills of students.

Semester-IV

BCH 4.1 Cost Accounting

To acquaint the students with basic concepts used in cost Accounting, Various methods involved in cost ascertainment.

BCH 4.2 Business Mathematics

To develop practical knowledge of mathematical techniques used in Business analysis by Matrix, Interest valuation, linear programming, and Transportation and Assignment Problems techniques

BCH 4.3 Computer Applications in Business

Skill development in using various computer tools for Business purpose like Word processing, Spreadsheet, Methods of presentation preparation

BCH 4.4 Indian Economy

Awareness of various issues of Indian Economy like it's' sectors, stages, trends, changes, Policy implications and role in global scenario

BCH 4.5 Entrepreneurship

To make students aware about different aspects of entrepreneurship qualities, factors, starting, documentation and various issues regarding entrepreneurship development.

Semester-V

BCH 501 Management Accounting-I

Imparting Knowledge of Management Accounting Tools like Financial Statement Analysis, Ratio analysis

BCH 502 Cost Accounting-I

To provide knowledge regarding Cost Analysis and its implication on Business Controlling

BCH 503 Indirect Taxes

Understanding of GST, Input Tax Credit Authorities, Penalties and Appeals under GST

BCH 504 Fundamentals of Entrepreneurship

To familiarize with different Investment alternatives, framework and role of Investor protection

BCH 505 E-Commerce

To familiarize with mechanism for conducting business transactions through electronic means

BCH 508 Money and Banking

To provide the knowledge regarding the banking scenario operative in the country and money markets too.

Semester-VI

BCH 601Management Accounting-II

Imparting Knowledge of Management Accounting Tools like Financial Statement Analysis, Ratio analysis.

BCH 602 Cost Accounting-II

To provide knowledge regarding Cost Analysis and its implication on Business Controlling.

BCH 603 Financial Management

To familiarize the students with principles and practices of Financial Management.

BCH 604 Corporate Management

To make the students aware about the management of the company form of organization

BCH 605 Productions and Operations Management

To provide the knowledge regarding the management of the operations and production techniques.

BCH 608 Financial Institutions and Markets

Imparting knowledge regarding the financial institutions, markets and instruments.

Program Name: B.Com.

The aim of three years degree Programme in B.Com. is to provide the learners a platform for character building to perform well & contribute to the society. Learning outcomes based curriculum framework (LOCF) is adopted to impart students with sound knowledge and humanistic skills, constructive & productive character developments so that they can respect the best people of the society.

Programme Outcomes (PO):

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

1. Learning outcomes based curriculum framework LOCF based curriculum three years degree B.Com. Programme help students to develop in depth knowledge of the areas like accounting, finance, marketing, human resource management, economics and business laws.
2. The graduates of B.Com. Programme will be able to develop skills and attitudes needed for critical thinking which will help them in a comprehensive problem solving approach. They shall be exposed to the pedagogy that helps them understand real life situations through class room training & and case studies. It aims at building the basic ability to think critically, evaluate dispassionately and solve complex problems creatively. The content is organised in such a way that the students would be able to think from diverse perspectives and suggest solutions according to their own sensibilities.
3. The Programme will help the students to develop reasoning based analytical ability which often requires in practical business life. B.Com. Programme is prepared in such a way that it helps students to solve various issues related to business:
    - Basics of accounting will help them to solve the problems like making accurate financial statements.
    - Managerial skills will help them to tackle various managerial centric problems like; to plan, to organise, decision- making, ideas formulating, controlling
4. B.Com. Programme contains various courses like principles of management, HR management, Industrial Relations which will help to learn managerial & entrepreneurial skills to work & timely manage the affairs of the business. These attitudes are developed through application of concept based practices, participative classroom discussions, problem solving tasks, case studies etc.

Programme Specific Outcome (PSO)

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

1. Understanding of individual and company accounting system.
2. Understand the functions and operations of bank, technological development in bankingand insurance companies.
3. Adequate knowledge on income tax provision and implication.

Course Outcomes:

1. Understand the functions and operations of bank, technological development inbanking and insurance companies.
2. Adequate knowledge on income tax provision and implication.

Semester I

BC/BBA1.1 Environmental and Road Safety Awareness

Creating awareness regarding Environmental and Road Safety issues

BC 1.2 Financial Accounting

Developing basic skills to maintain Accounts

BC 1.3 Business organisation and Management

To provide Basic knowledge about organization and management of businessenterprises

BC 1.4 English

To develop various skills of Business Communication (Business letters, Report Writing and Basic Vocabulary

BC 1.5A/1.5B Punjabi Compulsory/ Mudhla Gyan

Basic knowledge of Regional Language and its use in Business Advertisement and Correspondence

Semester II

BC 2.1 Ethical practices in Business

To develop various Ethical practices in Business

BC 2.2 Business law

Creating awareness about various Business Laws (Mainly Indian Contract Act ,Sale of Goods Act, Partnership Act and Negotiable Instruments Act)

BC 2.3 Business Mathematics and Statistics

Introduction with various tools used for a Statistical Analysis

BC 2.4 English

To develop various skills of Business Communication (Business letters, Report Writing and Basic Vocabulary

BC 2.5A/ 2.5 B Punjabi Compulsory/ Mudhla Gyan

Basic knowledge of Regional Language and its use in Business Advertisement and Correspondence

Semester III

BC 3.1 Company Law

Making clarity of Company rules and regulations

BC 3.2 Income Tax law and Practice

Creating knowledge of basics of Income Tax their Heads and computation of Tax

BC 3.3A/ 3.3 B Punjabi Compulsory/ Mudhla Gyan

Basic knowledge of Regional Language and its use in Business Advertisement and Correspondence

BC 3.4Computer Applications in Business

Enhancement of skills needed for Computerized Accounting System

BC 3.4Computer Applications in Business

Enhancement of skills needed for Computerized Accounting System

BC 305/305APunjabi / Basic Punjabi

To give knowledge of Regional language through Text book and developing skill of Paragraph writing

Semester IV

BC 4.1 Corporate Accounting

Developing skills to prepare Company Accounts

BC 4.2 Cost Accounting

To acquaint the students with basic concepts used in cost Accounting, Various methods involved in cost ascertainment

BC 4.3A/4.3BPunjabi Compulsory / Mudhla Gyan

To give knowledge of Regional language through Text book and developing skill of Paragraph writing

BC 4.4 E- Commerce

To familiarize with mechanism for conducting business transactions through electronic means

Semester V

BC 5.1 Human Resource Management

To acquaint students with the techniques and principles to manage human resource of an organization

BC 5.1 Principles of Marketing

To provide basic knowledge of Concepts, Principles, tools and Techniques ofMarketing

BC 5.2 Fundamentals of Financial Management

To familiarize the students with principles and practices of Financial Management

BC 5.3 Entrepreneurship

To familiarize with different Investment alternatives, framework and role of Investor protection

BC 5.4 Principles of Micro Economics

To culminate basic concepts / Principles of Micro economic Theory

BC 5.5A/5.5B3BPunjabi Compulsory / Mudhla Gyan

To give knowledge of Regional language through Text book and developing skill of Paragraph writing

Semester VI

BC 6.1 Corporate Tax Planning

To provide Basic knowledge of Corporate Tax planning and its impact on decision making

Semester VI

BC 6.1 Corporate Tax Planning

To provide Basic knowledge of Corporate Tax planning and its impact on decision making

BC 6.1 Banking and insurance

To impart knowledge about the basic principles of the banking and insurance

BC 6.1 International Business

To give knowledge of Concepts, Importance and dynamics of International Business and India’s role and involvement in global business

BC 6.2 Office Management and Secretarial Practices

To create awareness regarding Activities in Modern Office, Facilities and Working Environment for smooth official Working

BC 6.2 Fundamentals of Investment

To familiarize with different Investment alternatives, valuation to understand role of Investor Protection.

BC 6.2 Consumer Protection

To understand Rights of Consumer, and legal framework of Protection of Consumer Rights

BC 6.3 Personal Selling and Salesmanship

Practical skill development to understand fundamentals of Personal Selling and Selling Process

BC 6.4 Indian Economy

To enable in understanding major economic problems in India and their solutions along with knowledge of modern tools of Macroeconomic analysis and policy framework

BC 6.5A/6.5B Punjabi Compulsory / Mudhla Gyan

To give knowledge of Regional language through Text book and developing skill of Paragraph writing

Program Name: Bachelor of Commerce (Accounting and Finance) B.Com (A & F)

Programme Outcomes (PO):

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

1. Describe, explain, and integrate fundamental concepts underlying accounting, finance, management, marketing, and economics
2. Use information to support business processes and practices, such as problem analysisand decision making
3. Apply quantitative skills to help analyze and solve business problems and to takeadvantage of business opportunities
4. Apply oral and written communication skills

5. Describe and explain the ethical and social responsibilities of accountants in ensuring the integrity of financial information
6. Develop an understanding of internal control issues and the effects of the regulatory environment on financial reporting
7. Apply knowledge of managerial accounting theories to business organizations, state and
8. local governments, and nonprofit organizations
9. Apply knowledge of federal tax laws and procedures to individuals and businesses

Programme Specific Outcome (PSO)

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

1. Students will be able to demonstrate progressive learning of knowledge of Accountingand Computerized set of accounting books.
2. Learner will acquire practical skills to work as Tax Consultant, Audit Assistant and other financial supporting services.
3. Develop communication skills, both written and oral, for specialized and non-specialized audiences.

Course outcomesSemester I

BC/BBA - 1.1 Environmental and Road Safety Awareness

Creating awareness regarding Environmental and Road Safety issues

BCAF -1.2 Financial Accounting

To equip with skill of recording Financial Transaction

BCAF -1.3 Business Law

Creating awareness about various Business Laws (Mainly Indian Contract Act, Sale of Goods Act, Partnership Act and Negotiable Instruments Act)

BCAF -1.4 Communication Skills in English

To develop usage of Language and making English Language as a communication tool

BCP 101A/101B Punjabi Compulsory / Punjabi Compulsory(MudlaGyan/Elementary Punjabi)

To make efficient in regional language to do Business correspondence in better way

Semester II

BCAF-2.1 Corporate Accounting

To develop practical skills to maintain various Company Accounts

BCAF-2.2 Business organisation and Management

To provide Basic knowledge about organization and management of business enterprises

BCAF-2.3 Corporate Laws

To enhance knowledge of Company regulations

BCAF-2.4 Communication Skills in English

To develop usage of Language and making English Language as a communication tool

BCP 201A/201B Punjabi Compulsory / Punjabi Compulsory (MudlaGyan/Elementary Punjabi)

To make efficient in regional language to do Business correspondence in better way

CAE-1.2 Drug Abuse: Problem, Management and Prevention

To help the students to understand the cause of drug abuse and to prevent it.

Semester III

BCAF-3.1 Financial Management

Providing Concept knowledge of financial Analysis in management through various tools

BCAF- 3.2 Cost Accounting

To provide knowledge regarding Cost Analysis and its implication on Business Controlling

BCAF- 3.3 Income Tax Laws and Practice

Basic knowledge of Residential Status, Different Heads of Income Deductions and Computation of Tax

BCAF 3.4 Fundamentals of Computer Applications

Enhancement of skills needed for Computerized Accounting System

BCAF 3.5 Workshop on Personality development and Soft Skills

To develop usage of Language and making English Language as a communication tool

BCAF 3.6 Seminar (Based on Summer Training)

Development of practical skill and Imparting Knowledge of Accounting Tools

Semester IV

BCAF 4.1 Management Accounting

Imparting Knowledge of Management Accounting Tools like Financial Statement Analysis, Ratio analysis

BCAF4. 2 Indirect Tax Laws

Understanding of GST, Input Tax Credit Authorities, Penalties and Appeals under GST

BCAF 4.3 Fundamentals of Statistics

Introduction with various tools used for a Statistical Analysis

BCAF 4.4 Workshop on Contemporary Business Issues

To develop current knowledge of commerce related issues

BCAF 4.5 Seminar on Business Ethics & values

Value inculcation in students of commerce to understand their responsibility toward society and develop Ethics in their Applications

Semester V

BCAF–5.1 Current Issues in Accounting

Students will become familiar with Current Issues of Accounting.

BCAF 5.2 Fundamentals of Investment

Students will become familiar with concept of Investment and Portfolio Management

BCAF 5.3(a) Money and Financial Institutions

Students will become familiar with concept of Money, Banks, Institutional Credit and Interest rates and their Administration

BCAF 5.3(b) Business Environment

Students will become familiar with Concepts, Importance and dynamics of Business Environment and Global Organization

BCAF 5.4 (a) Banking and Insurance

Students will become familiar with basic principles of the Banking and Insurance

BCAF 5.4 (b) Auditing and Corporate Governance

Students will become familiar with Auditing Principles, Procedures and techniques in accordance with Current Legal requirements and overview of Corporate Governance.

BCAF 5.5 Business Economics

Students will become familiar with Economic tools like Demand, Production Price determination.

Semester –VI

BCAF 6.1 Security Analysis and Portfolio Management

Students will become familiar with Investment Portfolio Management and concept clearance and Theoretical Knowledge

BCAF 6.2 Project Planning and Control

Students will become familiar with Project Planning, Formulation environment along with Cost Management Techniques

BCAF 6.3(a) Public Finance

Students will become familiar with issues of Fundamentals of Public Finance

BCAF 6.3 (b) Strategic Cost Accounting

Students will become familiar with emerging concepts in cost management system

BCAF 6.4 (a) International Finance

Students will become familiar with Fundamentals of International Finance FDI, MNC Foreign Exchange Markets

BCAF-6.4(C) Operational Research

Students will become familiar with Concepts, Importance and Techniques of Operational Research,

BCAF 6.5 Change and Stress Management

Students will become familiar with concepts, Knowledge of Change and Stress Management

Program Name: BBA

Programme Outcomes (PO):

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

1. Enable students to apply knowledge of management theories and practical to solve business problems.
2. Encourage analytical and critical thinking abilities for decision making.
3. Promote ethical and value based leadership ability.
4. Enable students to effectively communicate business issues, management concepts, plansand decisional both in oral and written form using appropriate supportive technologies.
5. Enable students to demonstrate the appropriate techniques to effectively manage business challenges.
6. Make students capable of recognizing and resolving ethical issues.
7. Helps to prepare students for managerial roles and as entrepreneurs.

Programme Specific Outcome (PSO):

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

1. Provide verbal, reasoning, data interpretation, Quantitative and communication skill tosolve specific business problems and decision making.
2. Apply ethical principles and commitment towards professional ethics and responsibility.
3. Providing an opportunity for the students to gain practical exposure towards theworkplace and make them industry ready.
4. Promote entrepreneurship by providing understanding of fundamentals of creating and managing innovation, new business development and high growth potential entities.
5. Ability to analyze various functional issues affecting the organization.
6. Demonstrate effectively Oral and Written Communication.
7. Demonstrate ability to work in Groups.

Course outcomesSemester I

BC /BBA 1.1 Environmental and Road safety Awareness

Creating awareness regarding Environmental and Road Safety issues

BBA 1.2 Principles of Business Management

To provide Basic knowledge about organization and management of business enterprises.

BBA 1.3 Foundations of Accounting

Developing basic skills to maintain Accounts.

BBA 1.4 Communication Skills in English-I

To develop various skills of Business Communication.

BBA-101A Punjabi Compulsory/101B Mudla Gyan (Elementary Punjabi)

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence.

Semester II

BBA 2.1 Management based Workshop on Soft Skills

The objective is to develop both oral and written communication skills relating to organizational and Business issues.

BBA 2.2 Managerial Economics

It aims to acquaint students with economy as a whole including measurement of national income, inflation and unemployment.

BBA 2.3 Business Statistics

To make aware of statistical tools for analysis of quantitative data.

BBA-2.4 Ethics and Corporate Social Responsibility

Concept building of Corporate governance and Business ethics to be applied in practical

BBA -101A Punjabi Compulsory/ 101B Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it inofficial correspondence.

CAE1.2 Drug Abuse Problem Management and Prevention

To develop knowledge in students about Drug Abuse Problem Management and Prevention.

Semester III

BBA-3.1 Organisational Behaviour

It imbibes the students regarding individual and group behaviour in any organization.

BBA-3.2 Principles of Marketing Management

To understand the students about the basic Principles of Marketing Management.

BBA-3.3 Production and Operations Management

Developing knowledge about various steps of product, design, development, Plant location, Storage, Production Planning and control.

BBA- 3.4 Business Research Methodology

Understanding of the Research process, tools and techniques in order to facilitate managerial decision making.

BBA-3.5 Seminar on Entrepreneurship

To familiarize with different Investment alternatives, framework and role of Investor protection

BBA-301A Punjabi Compulsory/301B Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it inofficial correspondence.

Semester IV

BBA-4.1 Human Resource Management

To understand the students with the techniques and principles to manage human resourceof an organization.

BBA- 4.2 Financial Management

To develop a conceptual clarity and basic understanding of the fundamentals of corporate finance.

BBA-4.3 Organization Development and Change

To exploration of the field of OD through its human and social process.

BBA- 4.4 E-Commerce

To familiarize the student with the basic concept of e-commerce and to provide them the knowledge of planning, scheduling and controlling a successful e- business.

BBA-4.5 Business Environment

The main objective is to develop knowledge base for Environment factors affectingBusiness.

BBA-401A Punjabi Compulsory/ 401 B Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it inofficial correspondence.

Semester V

BBA-501 Communication Skills in Punjabi /BBA 501 A Elementary Punjabi

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence.

BBA-501 Business Research Methods

To enhance the knowledge about research methods and Techniques.

BBA-502 Workshop on Time and Workload Management

To enhance the knowledge about time and work management.

BBA -503 Seminar on Summer Training

The purpose of practical training to expose the students to real work of environment experience and gain the knowledge through hands on observation and job execution.

Choose any **Three** Subjects from not more than Two Functional Areas

Marketing Management BBA-505 Rural Marketing

To develop the conceptual clarity of area in rural Marketing.

BBA-506 Brand and Product Management

It imbibes the students regarding brand knowledge and managing the product.

Human Resource Management

BBA-508 Management of Industrial Relations

To understand the key participants, institutions, relationships and processes in employment relations.

Semester VI

BBA-601 Industrial Training Project

To making students aware regarding work on live projects which equip them with the required skill needed for the corporate world.

BBA-602 Project Report

The report will be prepared by the student under the guidance of respective project guide

BBA-603 Seminar on the Project Report.

To motivate the students in expressing their ideas in front of group and creating confidence ability.

BBA-5.4 Viva-Voce

To make technically strong in facing Curriculum based query.

Program Name: B.Voc. Hospitality and Tourism

Programme Outcomes (PO):

The broad category of fields within service industry includes lodging, event planning, theme parks, transportation, airline, cruise line, and such other employment opportunity within the hospitality & tourism industry. Today, service industry is a major source of income for many countries, and brings impact on the economy of both the source and host countries, in some cases being of vital importance. The B.Voc. In Hospitality and Tourism is a specialised undergraduate bachelor's degree Programme which prepares the graduate to acquire such skills so that they become trained skilled manpower in the Tourism & Hospitality Industry.

Programme Objective: Following are the broad Programme Objectives:

1. Industry experts and academicians welcome this announcement and view this as an opportunity for vertical mobility.
2. To provide students with a comprehensive understanding of the theoretical and applied aspects of Tourism & Hospitality Industry.
3. To inculcate all the desired skills of standard operating procedures & service provisionsto meet the needs of today's customer by providing desired services required in Tourism &Hospitality Industry.
4. To equip students with hospitality skills required to provide customer satisfaction into the hotel & tourism sector and fulfill guest requirements for food & beverage service, meetings, conferences, events, travel moments & caterings
5. Students completing the first year get a Diploma certificate, after second year they get the Advanced Diploma certificate and after completion of three years, the B.Voc. Hospitality and Tourism Degree is awarded.
6. The course curriculum has 40% general education (theory) and 60% vocational training (practical) components.
7. These Programmes follow semester system and offer credits after completion of the course.
8. Adequate emphasis should be given to language and communication skills.

9. The students who have enrolled in B.Voc. Hospitality and Tourism courses appreciate the practical focus and are confident that their chances of getting a suitable job are higher than other graduates.
10. The advantages of B.Voc. Hospitality and Tourism courses are that they help ensure the learners have adequate skills, make them work-ready and enhance the employability of the graduate students.
11. A unique feature of the curriculum is the blend of vocational and business management concepts. This higher education system incorporates the requirements of various industries in a flexible manner which develops holistic and well – groomed graduates thus meeting the emerging needs of the economy.

Programme Specific Outcome (PSO)

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

1. Explain theoretical framework of Tourism & Hospitality Industry.
2. Demonstrate the job role of F&B Service Steward in Hospitality Sector.
3. Demonstrate the job role of Meeting, Conference and Event Planner.
4. Demonstrate the job role of Tour Manager in Tourism Sector. • Demonstrate the job roleof Asst. Catering Manager in Hospitality Industry.
5. Effectively learn Customer Handling, service recovery & Guest Interfaces.
6. Appraise and interpret various acts and laws related to service sector.
7. Appraise and interpret various acts and laws related to retail sector
8. Skill-based education should be the foundation of modern education", with a similar view, the University Grants Commission (UGC), in 2013, introduced Bachelor of Vocation, commonly known as B.Voc. Hospitality and Tourism degree Programme with multiple entry and exit points. B.Voc. Hospitality and Tourism is a three-year Programmewhich specifically focuses on skill development and makes the students industry-ready.
9. Bachelor of Vocation is quite different from a common degree Programme as the curriculum of B.Voc. Hospitality and Tourism degrees involve 60 percent practical and

   40 percent theoretical learning's. The emphasis given on the practical and training aspect ensures that the students become more skilled and trained in their disciplines.

10. The multiple entry and exit points add to the flexible nature of the B.Voc. Hospitality and Tourism Programme. After completing one year, if the student opts for the exit, he/she is awarded a diploma certificate. Similarly, there are other exit points from where the students can take an advanced diploma or a full-fledged B.Voc. Hospitality and Tourism degree.
11. Enhancing the employability of the graduates and meeting the industry requirements was one of the many objectives behind introducing a Bachelor of Vocation degree course.
12. The course not only prepares the students for getting employment but also provides them with entrepreneurship skills. The career options after completing B.Voc. Hospitality and Tourism degree are trade- specific and are vast.

Semester I

PBVOC- 101A / B Punjabi

To create knowledge about the Vernacular language and to identify the local needs of the society. It is also a state obligation to study the Punjabi language in undergraduate courses.

BVHT 107 English (Communication Skills)

To enhance the communication skills in students to make them employable, it also helpful to increase customer handling skills.

BVHT 101 Workshop on Customer query and Complaint Management

To provide basic knowledge of Customer Query and Complaint Management, Problem Solving: methods and techniques, positive attitude, empowerment and Query Handling: Cashiering Activities and Night Auditing Procedure, Receiving payment method details from the guests, Prepare bills as per different categories of guests and Various modes of bill settlement. To aware about Safe Health and Hygiene in Hotels especially on cleanliness and Safe health practices.

BVHT 102 Introduction to Tourism, Aviation & Hospitality Industry

To provide basic knowledge of Tourism, Aviation and Hospitality Industry. To aware about the functions of travel agency, Air Transportation, Airport policies and rule. Type of hotels and its working.

BVHT 103 Front Desk Operation – I

To provide basic knowledge of Front Office Organization & Hierarchy. Provide awareness about the guest check-in and checkout process, Customer- Centric Service, Customer service

and Handling customer requests.

BVHT-104 Housekeeping Operation I

To provide basic awareness of Housekeeping in Hospitality Operation, Role of Housekeeping in Guest Satisfaction and Repeat Business, Organization Chart of The Housekeeping department.

BVHT 105 Seminar on Basics of Hospitality Service

To provide basic knowledge of Front Communication with Customers and Colleagues, Handling customer complaints/ feedback- Build friendly but impersonal relationship with the customers'. To aware about the Service Quality Standards, Achieving customer satisfaction, Gender and Age Sensitivity Maintaining IPR and educating customers on specific facilities and services available.

BC- 101 Environmental and Road Safety Awareness

To provide the awareness about the issues related to environment and Road Safety

Semester II

BVHT-201 Workshop on Geography of Tourism

To provide basic knowledge on Geography of Tourism and Importance of Geography in Tourism. Also provide practical aspect of Location of important tourist cities, national parks, wildlife sanctuaries; cultural, historical and religious tourist spots in India.

BVHT 202 Tourism Products of India

To provide basic knowledge of different tourism products in India. Aware about the Tourism products and also role of Heritage management organizations like UNESCO, ASI, ICOMOS, INTACH.

BVHT-203 FRONT OFFICE OPERATIONS II

To provide basic skills of Welcoming and greeting the guests, understanding reservation status, preparing for guest arrivals at Reservation and Front Office, Pre-registration and Registration

BVHT- 204 HOUSEKEEPING OPERATIONS II

To describe the functions of Room Layout And Guest Supplies -Standard rooms, VIP ROOMS, Guest's special requests Area Cleaning -Guest rooms , Front-of-the-house Areas, Back-of-the house Areas , Work routine and associated problems.

BVHT-205 Seminar on Hospitality Supervisory Skills

To provide basic knowledge of Hospitality and Tourism Management, Problem Solving: methods and techniques, positive attitude, empowerment and Query Handling.

BVHT- 206 on Job Practical Training & Report (Front Office Executive)

To provide basic awareness of front office operations and Role of FD managers in Housekeeping in Guest Satisfaction.

Semester III

BVHT 301 Management Principles and Practices

Build an understanding of theoretical framework of principles of management. The course aims to provide basic knowledge to the students about the organisation and management of a business enterprise.

BVHT 302: HUMAN RESOURCES MANAGEMENT

To give a conceptual understanding of human resource practices in business organizations. Performance appraisal and career planning techniques.

BVHT 303: WORKSHOP ON CUSTOMER RELATIONSHIP MANAGEMENT

To give an Overview and concept of Customer Relationship Management (CRM) practices in business organizations and strategy Management support System and Management Information System.

BVHT 304: FRONT OFFICE OPERATIONS-III

To familiarize with the front office operation. Aware about the Introduction Duties and responsibilities Front Office Department and Key control and key handling procedures.

BVHT 305: HOUSEKEEPING OPERATION III

To provide basic knowledge of Role of Housekeeping in Guest Satisfaction and Repeat Business, Customer- Centric Service, Customer service and Handling customer requests. Identifying Housekeeping Responsibilities and Personality Traits of housekeeping Management

BVHT 306: SEMINAR ON HOTEL AND RESORT MANAGEMENT

To provide basic knowledge of Role of Housekeeping in Guest Satisfaction and Repeat Business, Customer- Centric Service, Customer service and Handling customer requests. Identifying Housekeeping Responsibilities and Personality Traits of housekeeping Management

BVHT 307: ON JOB PRACTICAL TRAINING AND REPORT

To aware the practical aspects of hospitality and tourism sector, provide basic knowledge of Role of Housekeeping in Guest Satisfaction and familiarize with the front office operation

Semester IV

BVHT 401: Personality Development

To enhance holistic development of students and improve their employability skills. To develop communication and problem-solving skills. To re-engineer attitude and understand its influence on behavior.

BVHT 402: BASIC OF COMPUTER APPLICATION

The basic objective of the course is to introduce the students to the world of computers and computer technology. To introduce the students to the basic concepts of operating systems, World Processing, Database, presentations and Networking.

BVHT 403 Basic of French

To give knowledge about the French Language. To understand the problems of international tourists.

BVHT 404 Tourism Management

The module aims to provide the basic of Tourism upon which the entire hospitality Industry is based. Help to aware about the recent trends in tourism sector.

BVHT 405 Front Desk Operation IV

To provide basic knowledge of Front Office Organization and Hierarchy. Provide awareness about the guest check-in and checkout process, Customer- Centric Service, Customer service and Handling customer requests

BVHT 406 House Keeping Operations IV

To provide basic knowledge of Role of Housekeeping in Guest Satisfaction and Repeat Business, Customer- Centric Service, Customer service and Handling customer requests. Identifying Housekeeping Responsibilities and Personality Traits of housekeeping Management.

BVHT 407 Seminar Indian Societies and Culture

The Indian society and culture is the main tourist product of India. Its thorough knowledge is essential for any tourism professional to showcase this element for the satisfaction of the tourists visiting various parts of India. This course will brief learner about the core understanding of Indian society, culture and various religions in India.

BVHT 408 on the Job Tarining and Report

To provide basic knowledge of Front Office Organization and Hierarchy. Provide awareness about the guest check-in and checkout process, Customer- Centric Service, Customer service and Handling customer requests.

Semester V

BVHT 501: Travel Agency and Tour Operation Management

To understanding the roles of travel agents and tour operators. Aware the studentsabout the efficient working of travel agency and tour operation business.

BVHT 502: HOUSEKEEPING OPERATION –V

To familiarize with the house keeping operations, Layout of House Keeping Department, Hotel Guest Rooms and Work routine for floor supervisors and chamber maids.

BVHT 503: FRONT OFFICE OPERATIONS-V

To aware the recent standards in front desk operation, Plan and Control day to day Front Office Activities and Manage the Front Office Staffing Process.

BVHT 504: Seminar On Organisational Behaviour In Hospitality Industry

To handling the team working process and to manage the human behavioural aspects like perception and leadership. To aware the role of group dynamics and motivation among the students.

BVHT 505: Advertising And Personal Selling In Hospitality Services

To give conceptual understanding of advertising and personal selling practices in hospitality business organizations. Proper use and implementation of planning techniques for increase organisational profits.

BVHT 506: Ethical, Legal and Regulatory Framework of Tourism

To aware tourism Planning Process including development and Ethical, Legal and Regulatory Framework of Tourism industry.

BVHT 507: WORKSHOP ON HOTEL ACCOUNTING SYSTEM

The objective of this paper is to help students to acquire conceptual knowledge about accounting process used in front office.

Semester VI

The Sixth Semester will include industrial training that provide practical training and exposure, application of theoretical concepts in real life, it also enhance the employment skills. It tries to increase the communication and leadership skills. It provides first-hand experience of job environment.

Program Name: B.Voc. Retail Management

Programme Outcomes (PO):

Retail Sector has been at the helm of India's growth story. The Retail industry in India is vibrant and one of the fastest growing markets in the world especially in the sectors such as modern retail, traditional retail, e-commerce, direct selling, direct marketing etc. The B.Voc.in Retail Management is a specialised undergraduate bachelor's degree Programme which prepares the graduate to acquire such skills so that they become trained skilled manpower in the Retail sector.

Programme Objective: Following are the broad Programme Objectives:

1. To provide students with a comprehensive understanding of the theoretical and applied aspects of retail management.
2. To inculcate all the desired skills to meet the needs of today's customer by procuring the desired merchandise from the retail stores for their personal use.
3. To equip students with skills required to bring the customers into the store and respond to their buying needs.
4. Students completing the first year get a Diploma certificate, after second year they get the Advanced Diploma certificate and after completion of three years, the B.Voc. Retail Management Degree is awarded.
5. The course curriculum has 40% general education (theory) and 60% vocational training (practical) components.
6. These Programmes follow semester system and offer credits after completion of the course.
7. Adequate emphasis should be given to language and communication skills.

8. The students who have enrolled in B.Voc. Retail Management courses appreciate the practical focus and are confident that their chances of getting a suitable job are higher than other graduates.
9. The advantages of B.Voc. Retail Management courses are that they help ensure the learners have adequate skills, make them work-ready and enhance the employability of the graduate students.
10. A unique feature of the curriculum is the blend of vocational and business management concepts. This higher education system incorporates the requirements of various industries in a flexible manner which develops holistic and well – groomed graduates thus meeting the emerging needs of the economy.
11. Industry experts and academicians welcome this announcement and view this as an opportunity for vertical mobility.

Programme Specific Outcome (PSO)

After completing this course students will be able to:

1. Explain theoretical framework of Retail Management
2. Demonstrate the job role of Sales Associate
3. Demonstrate the job role of Team leader in retailing sector
4. Demonstrate the job role of Departmental Manager in an organised retail sector
5. Demonstrate the job role of Store Manager in any retail organisation
6. Effectively use Point Of Sale software
7. Appraise and interpret various acts and laws related to retail sector
8. Skill-based education should be the foundation of modern education", with a similar view, the University Grants Commission (UGC), in 2013, introduced Bachelor of Vocation, commonly known as B.Voc. Retail Management degree Programme with multiple entry and exit points. B.Voc. Retail Management is a three-year Programme which specifically focuses on skill development and makes the students industry-ready.
9. Bachelor of Vocation is quite different from a common degree Programme as the curriculum of B.Voc. Retail Management degrees involve 60 percent practical and 40 percent theoretical learning's. The emphasis given on the practical and training aspect ensures that the students become more skilled and trained in their disciplines.

10. The multiple entry and exit points add to the flexible nature of the B.Voc. Retail Management Programme. After completing one year, if the student opts for the exit, he/she is awarded a diploma certificate. Similarly, there are other exit points from where the students can take an advanced diploma or a full-fledged B.Voc. Retail Management degree.
11. Enhancing the employability of the graduates and meeting the industry requirements was one of the many objectives behind introducing a Bachelor of Vocation degree course. Thecourse not only prepares the students for getting employment but also provides them with entrepreneurship skills. The career options after completing B.Voc. Retail Management degree is trade-specific and is vast.

Course outcomesSemester I

PBVOC- 101A / B Punjabi

To create knowledge about the Vernacular language and to identify the local needs of the society. It is also a state obligation to study the Punjabi language in undergraduate courses.

BVHT 107 English (Communication Skills)

To enhance the communication skills in students to make them employable, it also helpful to increase customer handling skills.

BVRM 101: INTRODUCTION TO RETAIL MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of retail management.

BVRM 102: MANAGEMENT PRINCIPLES AND PRACTICES

This paper is aimed at providing students with a comprehensive understanding ofPrinciples of management.

BVRM 103: WORKSHOP ON VISUAL MERCHANDISING

This paper is aimed at providing students with a comprehensive understanding of Visual Merchandising.

BVRM 104: SEMINAR ON RETAIL SALESMANSHIP

This paper is aimed at providing students with a comprehensive understanding of Retail Salesmanship.

BVRM 105: FUNDAMENTAL OF COMPUTER APPLICATIONS

This paper is aimed at providing students with a comprehensive understanding of fundamental of computer applications and software's.

BC- 101 Environmental and Road Safety Awareness

To provide the awareness about the issues related to environment and Road Safety.

Semester II

BVRM 201: Store Display and Visual Merchandising

This paper is aimed at providing students with a comprehensive understanding ofPrinciples of store display and visual merchandising.

BVRM 202: ORGANISATION AND TEAM DYNAMICS

This paper is aimed at providing students with a comprehensive understanding of organisational working, team work, group culture, motivation and leadership qualities.

BVRM 203: Workshop on Store Cleanliness and Hygiene

This paper is aimed at providing students with a comprehensive understanding of Store Cleanliness and Hygiene.

BVRM 204: Seminar on Customer Relationship Management

This paper is aimed at providing students with a comprehensive understanding ofCustomer Relationship Management.

BVRM 205: E-COMMERCE

This paper is aimed at providing students with a comprehensive understanding of E-Commerce and Electronic trading.

Semester III

BVRM 301: FINANCIAL MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of financial management.

BVRM 302: ADVERTISING & SALES MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of Advertising and Sales Management.

BVRM 303: RETAIL STORES AND OPERATION MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of retail stores and operation management.

BVRM 304: HEALTH & SAFETY MANAGEMENT ISSUES IN RETAIL

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of health & safety management issues in retail.

BVRM 305: WORKSHOP ON MARKETING MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of Marketing Management.

BVRM 306: SEMINAR ON COMMUNICATION SKILLS

This paper is aimed at providing students with a comprehensive communication skill also in regional language.

Semester IV

BVHT 401: Personality Development

To enhance holistic development of students and improve their employability skills. To develop communication and problem-solving skills. To re-engineer attitude and understand its influence on behavior.

BVRM 402: PROJECT MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of Project Management.

BVRM 403: LEADERSHIP AND TEAM MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of leadership and team management.

BVRM 404: E-RETAILING

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of E – Retailing

BVRM 405: Workshop on Developing A Franchise System

This paper is aimed at providing students with a comprehensive understanding of Workshop on Developing a Franchise System.

BVRM 406: SEMINAR ON ENTREPRENEURSHIP SKILLS

This paper is aimed at providing students with a Entrepreneurship skills.

Semester V

BVRM- 501: MARKETING MANAGEMENT

The objective of the paper is to provide knowledge to students about marketing concepts, philosophies, processes and techniques in order to manage the overall marketing operations of the retail organisation.

BVRM- 502: BUSINESS ETHICS AND CSR

The objective of this paper is to familiarize the students with the importance of ethics in business and understanding of issues related to corporate social responsibility

BVRM- 503: RETAIL PLANNING AND LEGAL FRAMEWORK

The objective of the paper is aware the students about retail planning process including registration process, legal and regulatory framework of retail industry.

BVRM- 504: TOTAL QUALITY MANAGEMENT

The objective of the paper is to provide knowledge to students of the concepts of total quality management and to inculcate among them a concern for quality and customer satisfaction.

BVRM 505: WORKSHOP ON VISUAL MERCHANDISING AND CUSTOMER SATISFACTION

The basic objective of the course is to encourage students to understand about merchandising strategies required for retail market as well as the importance of colour theories for promotional displays. Focuses on consumer behaviour and how one can maximize profitability through visual display by creating a unique buying experience for the customers.

BVRM 506: SEMINAR ON RETAIL STORE TEAM MANAGEMENT

The basic objective is to provide knowledge to the students about building and managing retail store teams.

Semester VI

The Sixth Semester will include industrial training that provide practical training and exposure, application of theoretical concepts in real life, it also enhance the employment skills. It tries to increase the communication and leadership skills. It provides first-hand experience of job environment.

DEPARTMENT OF AGRICULTURE

SESSION: 2023-2024

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (Cos) of the Programmes.

Program Name: B. Sc. (Hons.) Agriculture

Program Outcomes

Agriculture course helps to learn basics of agriculture and allied subjects like agribusiness management, **agricultural** management, natural resources, livestock production, soil conditions. Students learn the working of the **agricultural** machinery like cropping machinery, harvesters.

Programme Specific Outcomes

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

Students of diploma are in high demand in Government agricultural firms, Banks, Plantations, Government fertilizer manufacturing firms etc. They are recruited there at the level of field assistants store manager, farm manager/assistant, horticulturist, gardeners etc.

Sermester-I

Course Name: Introductory Biology

Outcomes

1. To impart the knowledge of levels of organization and related functions in plant and animals.
2. To understand the concept of binomial nomenclature, cell and cell division.
3. To study about morphology of flowering plants.

Subject: Fundamentals of Horticulture

Outcomes:

1. Students acquire knowledge on fundamentals of horticulture.
2. The students are expected to gain knowledge about the initial maintenance of the fruit trees and also about the various systems of planting of trees.
3. Also know about the different types of gardens, lawn making, medicinal & aromatic plants.

Course Name: Fundamentals of Agronomy

Outcomes

1. Developing the skill on crop-based plant nutrition, their sources and application schedule, techniques to apply nutrient as foliar spray.
2. Ability in identifying weeds of crop fields and non- cropped areas, their management, herbicide types and their spraying techniques.

Course Name: Introduction to Forestry

Outcomes

1. Students will gain fundamental knowledge of forestry as well as agroforestry.
2. Ability in identifying forest trees and their management.

Course Name: Agricultural Microbiology

Outcomes

1. Students will learn to identify the microorganisms, their role in eco-system and bio - diversity.

Course Name: Fundamentals of Soil Science

Outcomes

1. Students will acquire knowledge on fundamental and basic aspects of soil science.

Course name- Elementary mathematics

Outcomes:

1. **S**tudents will Understand and apply fundamental concepts of mathematics applicable in agriculture
2. Also study of theoretical concepts of Algebra, Calculus and Mathematical modelling.

Course name- Rural Sociology and Educational Psychology

Outcome

1. Students understand the characteristics of rural society, social institutions, culture, social values and relevance in Agricultural Extension.
2. Students understand the educational psychology, learning and teaching situation.
3. Students access the personality types, emotions of human beings and motivation.

Course name- Fundamentals of Agriculture Extension

Outcome

1. Students will learn about the extension of agriculture in rural areas.
2. Schemes that will help the farmers for the advancement in agriculture.

Course name- Comprehension skills in English

Outcome

1. Basics of English language
2. Analyze intercultural communication skills, interpersonal communication skills and public speaking skills

Course name- Punjabi Compulsory

Outcome

1. Understanding of cultural and religious studies of particular region

Course name- Punjabi (Mudhla Gyan)

Outcome

1. Knowledge of regional language

Course name- Drug Abuse: Problem, Management and Prevention

Outcome

1. Awareness about various types of drugs and their consequences to individual and society
2. Basic knowledge about drugs.

Semester-II

Course Name: Fundamentals of Plant Pathology

Outcomes

1. To provide basic knowledge about the pathogen.
2. To provide knowledge about the ecology of pathogen

Course Name: Fundamentals of Entomology

Outcomes

1. At the end of the course students will acquire the knowledge on insect's body structure and function.
2. They will learn the various interactions in the environment including population dynamics of insect and natural balance of life.

Course Name: Soil and Water Conservation Engineering

Outcomes

1. This course enables the students in advances in soil and water conservation engineering such as soil loss, sedimentation, rainfall models, and channel flow

Course name- Fundamentals of Genetics

Outcomes:

1. Understand patterns of nuclear and extranuclear inheritance such as mitochondrial
2. Track traits through maternal and paternal ancestry
3. Identify genes, their function, and impact of mutations using model systems
4. Describe principles of population genetics
5. Decide the optimal method of genetic analysis to understand a gene's function

Course name- Fundamentals of Agricultural Economics

Outcomes:

1. Expresses agricultural business, farmer, agricultural activities and the relationship between agricultural economy with other disciplines
2. Emphasizes the importance of agricultural economy
3. Describes the importance of farm enterprises to provide raw material of farm production and creates functional connections between output and inputs

Course name- Fundamentals of Crop Physiology

Outcomes:

1. Crop physiology provides insights into plant responses to environmental stresses.
2. It aids in developing stress-tolerant cultivars with improved yields.
3. Understanding plant growth processes supports effective agronomic decision-making.
4. Crop physiological studies contribute to sustainable farming practices.

Course name- Communication skills and Personality Development

Outcomes:

1. Basics of English language
2. Students will get the complete insight into the basics of communication skills
3. Personality traits

Course name- Punjabi Compulsory

Outcome

1. Understanding of cultural and religious studies of particular region

Course name- Punjabi (Mudhla Gyan)

Outcome

1. Knowledge of regional language

Course name- Agricultural Heritage

Outcomes:

1. **S**tudents will gain fundamental knowledge of ancient agriculture practices

Also about its relevance to modern agriculture practices

Course Name: Fundamentals of Plant Biotechnology and Biochemistry

Outcome: Understand patterns of nuclear and extra nuclear inheritance such as mitochondrial

1. Track traits through maternal and paternal ancestry
2. Identify genes, their function, and impact of mutations using model systems
3. Describe principles of population genetics
4. Decide the optimal method of genetic analysis to understand a gene's function

Course Name: Environment and Road Safety Awareness

Outcomes

1. Student will get to know about the components of environment.
2. Cope up with the natural calamities.
3. Road safety awareness among the students

Semester-III

Course Name: Livestock and Poultry Management

Outcomes

1. The course knowledge directly reflects on the operation of livestock and poultry farming being taken as a major component of integrated farming system in agriculture.
2. Mini farming unit provides a sustainable source of income to landless farmers and generate employment opportunity in rural areas. The course provides basic knowledge for its operation.

Course Name: Fundamentals of Plant Breeding

Outcomes:

1. The students learn about the role of plant breeding in the agriculture sector.

2. They also get familiarized with the various breeding methods.

Course Name: Farm Machinery and Power

Outcomes

1. Students will learn about tractors and become familiar with its system which will helpful during working in the field.
2. They become familiar with different kind of implements used in agriculture, their required adjustments and the financial aspects of using farm power.

Course Name: Crop production technology-I (Kharif crops)

Outcomes

1. Students will learn to grow crops for commercial purposes.
2. Students will learn to grow crops with minimum input and get maximum output.

Course Name: Agricultural Finance and cooperation

Outcomes

1. Expresses agricultural business, farmer, agricultural activities and the relationship between agricultural economy with other disciplines
2. Emphasizes the importance of agricultural economy
3. Describes the importance of farm enterprises to provide raw material of farm production and creates functional connections between output and inputs

Course Name: Agri -informatics

Outcome:

1. Students will learn about basic information of computers in agriculture
2. Basic software used in agriculture and their operation procedures.

Course Name: Production Technology for Vegetables and Spices

Outcomes:

1. Students will learn about the the cultivation of vegetables and spieces
2. Basic Knowledge about the various Spieces.

Course Name: Statistical Methods

Outcomes:

1. Making familiar with elementary statistical methods of analysis of data viz. measures of central tendency, dispersion, moments, skewness and to interpret them.

Course Name: Human Values and Ethics

Outcome:

1. Students will understand the significance of value inputs and start applying them in their life and profession.

Semester-IV

Course Name: Pests of Crops and Stored Grains and their Management

Outcomes

1. To acquaint the students about the pest infestation and type of damage caused by invertebrate and vertebrate pests such as insect, mites, slugs, rodents, birds and their management.
2. The pest's infestation in stored grains and their produce and their management.

Course Name: Food Safety and Standards

Outcomes

1. To study about the food safety, quality and various required factors on food.
2. Discuss the important pathogen and spoilage microorganism in foods.
3. Students will learn the basic principles and practices of cleaning and sanitation in food preparation operation.

Course Name: Production Technology for Ornamental Crops, MAP and Landscaping

Outcomes:

1. The students know about the uses of ornamental and medicinal trees, shrubs and climbers.
2. They get scientific knowledge about the cultivation and processing of ornamental, aromatic and medicinal crops.
3. To know about the landscaping and its features.

Subject: Production Technology for Fruit and Plantation Crops

Outcomes:

1. They get to know about the uses of fruit trees.
2. They get scientific knowledge about the cultivation and processing of fruits.

Course Name: Crop improvement-II (Rabi crops)

Outcomes

1. Students will understand the origin, distribution and different breeding methods to be adopted for the development of varieties/hybrids in various field and horticultural crops.
2. Students know about the plant genetic resources, centres of diversity and breeding for resistance to biotic and abiotic stresses.
3. Students learn about the influence of Genotype x Environment interaction on yield performance.

Course Name: Problematic Soils and their Management

Outcomes

1. To know about the knowledge of soil quality, soil health, characteristics of soil health, to give scientific knowledge of acidic, saline & sodic soil and their management.

Course Name: Agricultural Marketing Trade and Prices

Outcomes:

1. Expresses agricultural business, farmer, agricultural activities and the relationship between agricultural economy with other disciplines
2. Emphasizes the importance of agricultural economy
3. Describes the importance of farm enterprises to provide raw material of farm production and creates functional connections between output and inputs

Course Name: Principles of Seed Technology

Outcome:

1. Production of hybrid seed of different crops to increase the farm income

Course Name: Agri-business management

Outcomes:

1. Expresses agricultural business, farmer, agricultural activities and the relationship between agricultural economy with other disciplines
2. Emphasizes the importance of agricultural economy
3. Describes the importance of farm enterprises to provide raw material of farm production and creates functional connections between output and inputs

Course Name: Farming System and Sustainable agriculture.

Outcomes

1. The student will have studied and analyzed sustainable crop production intensification will offer a range of productivity, socio-economic and environmental benefits to producers and to society.
2. The student will be able to explain in general the relationships among culture, economics, politics, science, and agricultural development.

Course Name: Weed Management

Outcomes

1. To know about the different kinds of weed and their management.
2. To give knowledge about different kinds of herbicides & bio-herbicide their use.

Course Name: Production technology for Ornamental crops, MAP and Lanscaping

Outcomes:

1. The students know about the uses of ornamental and medicinal trees, shrubs and climbers.
2. They get scientific knowledge about the cultivation and processing of ornamental, aromatic and medicinal crops.
3. To know about the landscaping and its features

Course Name: Renewable Energy and Green Technology

Course Outcomes:

1. Understand role of renewable sources in agriculture sector and their applications in today's world.

Semester-V

Course Name: Diseases of Field & Horticultural Crops & their Management-I

Outcomes:

1. To study the causal organism, symptomatology, etiology and epidemiology of the important diseases of field crops for devising efficient management strategies against them.
2. To study the causal organism, symptomatology, etiology and epidemiology of the important diseases of horticulture crops for devising efficient management strategies against them

Course Name: Principles of Integrated Pest and Disease Management

Outcomes

1. This subject can help to students to know about pest and damage,
2. how to control pest and what are the methods that are useful to prevent insect pest &disease
3. Students can learn different types of symptoms that take place in plant parts.
4. They can know about what is IPM and their use

Course Name: Protected Cultivation (Hort-312)

Outcomes:

1. Students learn about different methods of protected cultivation practices available for vegetable crops and flowers.
2. Students also know about cultivation practices of economically important medicinal and aromatic plants.

Course Name: Manures, Fertilizers and Soil Fertility Management

Outcomes:

1. Students get to know about chemistry of different soil nutrients.
2. This course helps the student to analyse nutrients available in soil and plants.
3. Students will learn soil testing techniques.

SemeSter-V

Course Name: Crop production technology-I (Kharif crops)

Outcomes

4. Students will learn to grow crops for commercial purposes.
5. Students will learn to grow crops with minimum input and get maximum output.

Course Name: Principles of Food Science and Nutrition

Course Outcomes

1. Students got the knowledge of principles of crop planning and selection of crop.
2. Students gathered the field experience on raising of crops in their field with special emphasis on the agronomic management of the crop.
3. Students were familiarized with the calculation of economics of crop cultivation.

Course Name: Agrochemicals

Outcomes

1. Through this course students will analyse the manufacturing of mixed and complex fertilizers.
2. Students get the knowledge about reduced risk insecticides, botanicals, bio-insect repellents and plant based biopesticides for ecological agriculture.

Course Name: Principles of Integrated Pest and Disease Management

Outcome:

1. To study the causal organism, symptomatology, etiology and epidemiology of the important diseases of field crops for devising efficient management strategies against them.
2. To study the causal organism, symptomatology, etiology and epidemiology of the important diseases of horticulture crops for devising efficient management strategies against them

Course Name: Manures, Fertilizers and Soil Fertility Management

Outcomes

1. Students get to know about chemistry of different soil nutrients.
2. This course helps the student to analyse nutrients available in soil and plants.
   Students will learn soil testing techniques.

Course Name: Diseases of Field & Horticultural Crops & their Management-I

Outcomes

3. To study the causal organism, symptomatology, etiology and epidemiology of the important diseases of field crops for devising efficient management strategies against them.
4. To study the causal organism, symptomatology, etiology and epidemiology of the important diseases of horticulture crops for devising efficient management strategies against them.

Course Name: Entrepreneurship Development and Business Communication

Outcome:

1. Expresses agricultural business, farmer, agricultural activities and the relationship between agricultural economy with other disciplines
2. Emphasizes the importance of agricultural economy
3. Describes the importance of farm enterprises to provide raw material of farm production and creates functional connections between output and inputs

Course Name: Practical Crop Production – I (Kharif Crops)

Outcome:

1. Practical knowledge about the production of the different kharif Crops

Course Name: Intellectual Property Rights

Outcome:

1. Develops procedural knowledge to legal system and skills to pursue professional programs in company secretaryship, law, business, international affairs and other fields

Course Name: Protected cultivation

Outcome:

1. Students learn about different methods of protected cultivation practices available for vegetable crops and flowers.
2. Students also know about cultivation practices of economically important medicinal and aromatic plants.

SemesterVI

Course Name: Management of Beneficial Insects

Course Outcomes

1. To familiarize the students with entrepreneurial opportunities in entomology, provide information on productive insects and their products,
2. To acquaint them with the mass production techniques and field evaluation of various biological control agents like parasitoids, predators and various entomopathogenic microorganisms

Course Outcome: Post-harvest Management and Value Addition of Fruits and Vegetables

Outcomes:

1. To enable the students for application of postharvest technologies in their career through practical knowledge.

2. To identify and provide inputs to mitigate postharvest losses during cool chain management.
3. To provide skill on postharvest loss reduction through processing of fruits and vegetables.

Course Name: Rainfed Agriculture and Watershed Management

Outcomes

1. Through this course students will know about different types of watershed management and types of rainfed agriculture as well as drought.
2. Students will know about the concepts & techniques of water harvesting & soil & water conservation techniques.

Course Name: Crop improvement-II (Rabi crops)

Outcomes

1. Students will understand the origin, distribution and different breeding methods to be adopted for the development of varieties/hybrids in various field and horticultural crops.
2. Students know about the plant genetic resources, centres of diversity and breeding for resistance to biotic and abiotic stresses.
3. Students learn about the influence of Genotype x Environment interaction on yield performance.

Course Name: Principles of Organic farming

Outcomes

1. Student can explain the concepts of organic farming.
2. Use of various organic inputs for crop production, use of non-synthetic agents for crop production, will get some idea about organic certification.

Course Name: Diseases of Field and Horticultural Crops and their Management-II

Outcome:

1. To study the causal organism, symptomatology, etiology and epidemiology of the important diseases of field crops for devising efficient management strategies against them.

2. To study the causal organism, symptomatology, etiology and epidemiology of the important diseases of horticulture crops for devising efficient management strategies against them.

Course Name: Farm Management, Production and Resource Economics

Course Outcome:

1. Knowledge on resource allocation in the farm level and concepts of farm management

Course Name: Landscaping

Outcomes

1. Through this course students will know about different practices of landscaping and management of lawn & bonsai.
2. Students will know about the planting schemes of trees, climbers, annuals, cacti & succulents.

Course Name: Biopesticides and Biofertilizers

Outcomes

1. Students will come to know about various biofertilizers and biopesticides.
2. Use of biofertilizer in organic framing
3. Students will get to know about the production technology of biofertilizer and biopesticides.

Semester-VII

Course Name: Mushroom cultivation

Outcome:

1. Detailed hand-on training on mushroom cultivation, packaging and marketing. Development of business plan on mushroom cultivation

Course Name: Organic Production Technology

Outcomes

1. The student will have studied and analyzed sustainable crop production intensification will offer a range of productivity, socio-economic and environmental benefits to producers and to society.
2. The student will be able to explain in general the relationships among culture, economics, politics, science, and agricultural development.

Course Name: Floriculture and Landscaping

Course Outcomes:

1. Learn to beautify land, making terrariums and bonsai and management of lawn

Course Name: Seed production Technology

Outcomes:

1. Start a seed production program for fulfilment the requirement of quality seed in market and increase the income and production of hybrid seeds

Course Name: Rural Agricultural Work Experience and Agro-industrial attachment

Course Outcome:

1. Appreciate the importance of undergoing a practical rural agricultural education programme and Recommend and solve farmers problems faced during crop production and Comprehend extension activities and know how technology gets transferred from lab to land.

Course Name: Production Technology for bioagents and biofertilizers

Outcome:

1. Production of biocontrol agents like Trichoderma, Pseudomonas and bio fertilsers like phosphobacteria for commercial marketing

Course Name: Soil, Plant, Water and Seed Testing

Outcome:

1. Knowledge of procedure of soil testing and establish soil testing laboratory in future as a entrepreneur.

Course Name: Commercial Beekeping

Outcome:

1. Practical knowledge on commercial bee keeping for honey production

Course Name: Poultry production technology

Outcome:

1. Advanced knowledge in poultry embryology, natomy, physiology, immunology, genetics and behaviour.

Course Name: commercial Horticulture

Outcome:

1. Nurseries of different vegetables crops for commercial sale.

Course Name: Food Processing

Outcome:

1. Learn to boost shelf life of food products and provide employment to a large population

Course Name: Agriculture Waste Management

Outcome:

1. Promise food security and energy supply chain besides mitigating environmental pollution

Course Name: Commercial Sericulture

Outcome:

1. Acquire sound knowledge on different components of sericulture industry and gain skills with hands on training on mulberry cultivation and carry forward to field.

Semester-VIII

Course Name: Mushroom cultivation

Outcome:

1. Detailed hand-on training on mushroom cultivation, packaging and marketing. Development of business plan on mushroom cultivation

Course Name: Organic Production Technology

Outcomes

1. The student will have studied and analyzed sustainable crop production intensification will offer a range of productivity, socio-economic and environmental benefits to producers and to society.
2. The student will be able to explain in general the relationships among culture, economics, politics, science, and agricultural development.

Course Name: Floriculture and Landscaping

Outcomes:

1. Learn to beautify land, making terrariums and bonsai and management of lawn

Course Name: Seed production Technology

Outcomes:

1. Start a seed production program for fulfilment the requirement of quality seed in market and increase the income and production of hybrid seeds

Course Name: Rural Agricultural Work Experience and Agro-industrial attachment

Outcome:

1. Appreciate the importance of undergoing a practical rural agricultural education programme and Recommend and solve farmers problems faced during crop production and Comprehend extension activities and know how technology gets transferred from lab to land.

Course Name: Production Technology for bioagents and biofertilizers

Outcome:

1. Production of biocontrol agents like Trichoderma, Pseudomonas and bio fertilsers like phosphobacteria for commercial marketing

Course Name: Soil, Plant, Water and Seed Testing

Outcome:

1. Knowledge of procedure of soil testing and establish soil testing laboratory in future as a entrepreneur.

Course Name: Commercial Beekeping

Outcome:

1. Practical knowledge on commercial bee keeping for honey production

Course Name: Poultry production technology

Outcome:

1. Advanced knowledge in poultry embryology, natomy, physiology, immunology, genetics and behaviour.

Course Name: commercial Horticulture

Outcome:

1. Nurseries of different vegetables crops for commercial sale.

Course Name: Food Processing

Outcome:

1. Learn to boost shelf life of food products and provide employment to a large population

Course Name: Agriculture Waste Management

Outcome:

1. Promise food security and energy supply chain besides mitigating environmental pollution

Course Name: Commercial Sericulture

Outcome:

1. Acquire sound knowledge on different components of sericulture industry and gain skills with hands on training on mulberry cultivation and carry forward to field.

DEPARTMENT OF AGRICULTURE

SESSION: 2023-24

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (Cos) of the Programmes.

Program Name: B.Voc. (Food Processing)

Programme objectives: This under graduate course is meant to prepare students for the upcoming food industry.

Programme Specific Outcomes: Students can place themselves as Food Lab Technician, Food Processing Operator, Machinery inspection, Food Handler, Research Scientists, Organic Chemists, Food Inspector, Managers and Accountants, Hospitals, Restaurants, Food Processing Companies, Catering Establishments and services, Food Research Laboratories, Retailers, Food Wholesalers, Packaging Industries, Consultant, Entrepreneur etc.

Semester- I

Course Name: Punjabi/Mudla Gyan

Outcomes

1. To gain the knowledge of Punjabi language.
2. To help students to think analytically.
3. Fosters an understanding of Punjabi culture, language, and heritage, enhancing cultural literacy

Course Name: English (Communication Skills)

Outcomes

1. Improve communication skills, critical thinking, and analytical abilities.
2. To improve ability to perform well in problem-solving situations in general.

Course Name: Introductory Food Microbiology

Outcomes

1. To name and describe the beneficial and spoilage microorganisms associated with food.
2. To understand the growth and methods of isolation of microorganisms from food.
3. To evaluate the role of microorganisms in various foods and water.

Course Name: Dairy Technology

Outcomes

1. To gain knowledge on milk source and composition.

2. To understand the various milk processing methods. To demonstrate hands-on skills in manufacturing selected dairy products in a pilot plant setting.
3. To evaluate the safety and quality factors that determines the acceptability of the dairy products by consumers.

Course Name: Food Chemistry & Nutrition

Outcomes

1. To name and describe the general chemical structures of the major components of foods (water, proteins, carbohydrates, and lipids) and selected minor components (vitamins and minerals).
2. To relate the chemical composition of foods to their functional properties.
3. To apply their knowledge in food biochemistry and nutrition in designing new range of products with improved nutritional characteristics

Course Name: Drug Abuse: Problem, Management and Prevention

Outcomes

1. Understanding the physiological, psychological, and social impacts of drug misuse.
2. Awareness about the effects of drug addiction, intervention to help change behavior, and motivation to sustain recovery.

Semester- II

Course Name: Punjabi/Mudla Gyan

Outcomes

1. To gain the knowledge of Punjabi language.
2. To help students to think analytically.
3. Fosters an understanding of Punjabi culture, language, and heritage, enhancing cultural literacy

Course Name: English (Communication Skills)

Outcomes

1. Improve communication skills, critical thinking, and analytical abilities.
2. To improve ability to perform well in problem-solving situations in general.

Course Name: Fundamentals of Food Processing

Outcomes

1. The students understand the operation and various factors affecting food processing equipment.
2. The students learn to select suitable processing equipment. To develop unit operation system for food processing

Course Name: Cereal and Pulses Technology

Outcomes

1. To gain knowledge about the basic composition and structural parts of food grains.
2. To know about paddy processing and rice milling equipment which will help them for developing entrepreneurial skills.
3. To apply the knowledge to process food grains into value added products

Course Name: Food Plant Design and Management

Outcomes

1. To gain knowledge on the various factors involved in setting up a Food Processing Industry.
2. To understand the process of food plant layout design and apply their knowledge to design projects for setting up a Food Processing Industry.

Course Name: Fruit and vegetable processing

Outcomes

1. To understand the production status and post-harvest handling methods of fruits and vegetables.
2. To learn the methods of processing and preservation of freshly harvested and cut fruits and vegetables
3. To understand the dehydration methods and design of driers used for drying fruit and vegetables.
4. To describe the aseptic technology for product preservation.

Course Name: Environment Studies and Road Safety awareness

Outcomes

1. Provides knowledge and skills necessary to contribute to environmental sustainability and address global environmental challenges.
2. Identify environmental hazards affecting air, water and soil quality.
3. Assess environmental- related risk and develop control to reduce or eliminate risk

Semester- III

Course Name: Food Packaging Technology

Outcomes

1. To study about the functions of packaging along with the influence of various factors on food.
2. To know about the different packaging materials like cans, bottles, flexible films etc.
3. To enable the students to understand applications of various packaging materials in food industry.
4. To understand food quality and need food packaging.

Course Name: Documentation and statistics in food industry

Outcomes

1. The course will help in better understanding the importance of documentation in food processing industries
2. The student will develop the understanding of working of statistical methods and its applications to food industry situations.

Course Name: Bakery and snacks product

Outcomes

1. Proficiency in a range of baking techniques, including mixing, fermentation, proofing, and baking, to achieve desired product characteristics.
2. Detailed understanding of the components of various breads , cookies, biscuits, cake preparation.

Course Name: Introduction to Grain milling and Machineries

Outcomes

1. To know the principle and working of various processing equipments.
2. To know the methods of product recovery of different equipments.
3. Students can select suitable unit operations for a specific purpose

Course Name: Introduction to Computers

Outcomes

1. Develop basic skills in using common software applications and become familiar with computer ethics and security considerations
2. An ability to identify, formulate and develop solutions to computational challenges.

Semester- IV

Course Name: Food Plant Design and Management

Outcomes

3. To gain knowledge on the various factors involved in setting up a Food Processing Industry.
4. To understand the process of food plant layout design and apply their knowledge to design projects for setting up a Food Processing Industry.

Course Name: Meat Fish and Poultry Processing

Outcomes

1. To understand the slaughtering, carcass processing methods and equipments used for processing meat.
2. To understand the HACCP of meat processing.
3. To evaluate the processing of poultry meat, meat products and egg products.

4. To predict the role of microorganisms in spoilage, biochemistry, preservation of meat and fishery products.

Course Name: Quality Control and Regulations

Outcomes

1. To understand the regulations followed in various food industries.
2. To analyze the safety operations involved in food systems.
3. To evaluate the steps involved in the process operations in food industries.
4. To prepare HACCP standards for food industries.

Course Name: Food Spoilage and control

Outcomes

1. To know the methods of preservation of foods.
2. Students will develop knowledge about bacterial and non-bacterial food borne diseases.
5. Learners will learn various techniques to isolate and identify microorganisms from food samples

Course Name: Holistic Development: Physical Training

Outcomes

1. Develop physical, mental, emotional, social, and even spiritual well-being.
2. Educational approach that takes into account the students mental and physical health.

Semester- V

Course Name: Sugar and Confectionery Technology

Outcomes

1. The students have gained knowledge on the ingredients of confectionery products.
2. The students have gained knowledge of the process and machinery involved in bakery and confectionery technology.
3. The students have acquired experience of entrepreneur skills of conefectionery processing.

Course Name: Food Industry waste Management

Outcomes

1. To enable the student, understand the nature of food wastes and methods of treatment.
2. To enable the student, know the importance of waste utilization in Food industries.
3. Students will attain knowledge about various legalizations on food industry and its environmental impact.
4. Students will gain knowledge on getting value-added products from wastes

Course Name: Presentation Skills and Personality Development

Outcomes

1. Improved capacity to adapt communication style to different audiences and situations, fostering versatility in interpersonal interactions.
2. To improve ability to perform well in problem-solving situations in general.

Course Name: **Marketing and Retail Management**

Outcomes

1. Developed proficiency in creating effective marketing strategies to position products or services, considering market demands and business objectives.
2. Demonstrate an understanding of fundamental concepts of product and brand.

Course Name: Entrepreneurship Development in Food Processing

Outcomes

1. Developed the ability to create comprehensive business plans for food processing ventures, outlining strategies for product development, marketing, and financial sustainability.
2. Practice critical and creative thinking to improve the decision making process.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

DEPARTMENT OF DEFENCE STUDIES

SESSION: 2023-24

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: BA

Course Name: Defence Studies

1. Upon completion of the Course in Defence Studies, a student should have acquired basic competency in strategic affairs covering a wide spectrum of interstate security to global security issues including non- kinetic dimensions. Shall develop capability in understanding the implications of use and threat of use offorce in International relations.
2. Shall seek, identify and apply the acquired knowledge in defence and strategic studies on contemporaryissues of strategic relevance.
3. Ability to move from LOTS (Lower Order of Thinking Skills) to HOTS (Higher Order of ThinkingSkills) in Defence and Strategic Studies.
4. The learning of strategic studies shall arm the candidates to independently choose further course of action in his/her life whether pursuing higher education by taking specialized course in honors or identifying a career for himself or herself.
5. Understand and Appreciate Professional Ethics, Community Living and Nation

PROGRAMME SPECIFIC OUTCOMES

1. The Programme will help the students to develop a realistic view which make them competitive globally. It will enhance their overall knowledge and help them to fetch jobs both in public and private domain.
2. To create academic excellence through holistic education.
3. Ability to identify and apply the knowledge of subject and historical aspects of war and the origin.
4. To introduce the student to the art of war and dimension and types of warfare.
5. To learn the evolution of warfare, weapons transformations and strategies.
6. To learn the evolution of warfare, weapons transformations and strategies in Indian context.

7. To give a detailed account on the development National security, requirement and implementation global perspective.
8. To give a detailed account on the development National security, requirement implementation global perspective.

COURSE OUTCOMES

War and its various aspects BA-DEF113

1. Ability to identify and apply the knowledge of subject and historical aspects of war and the origin.

Theoretical Dimensions of Warfare BA-DEF 213

1. To introduce the student to the art of war and dimension and types of warfare.

Evolution of Warfare BA-DEF 313

1. To learn the evolution of warfare , weapons transformations and strategies.

Evolution of Warfare in India BA-DEF 413

1. To learn the evolution of warfare , weapons transformations and strategies in Indian context.

National Security BA-DEF513

1. To give a detailed account on the development National security, requirement and implementation global perspective.

Regional Security BA-DEF 613

1. To give a detailed account on the development Regional security, Development requirement andimplementation global perspective.

DEPARTMENT OF FINE ARTS

SESSION: 2023-24

Under Graduate Courses

Programme Outcomes (POs), Programme Specific Outcome (PSO), Course Outcome (CO) of the Programmes

Programme Name: BA

Course Name: Fine Arts (Elective)

Programme Outcomes

1. After completing a B.A. in Fine Arts, Students can pursue careers as professional artists, art educators, gallery curators, or art administrators. Some may choose roles in graphic design, illustration, or animation.
2. The graduates might explore opportunities in art therapy, museum curation, or art-related entrepreneurship. The versatility of a Fine Arts degree allows for diverse career paths in both the creative and cultural sectors.
3. Enhance skills to understand the concepts of principles, terminology of art and aesthetics.

Programme Specific Outcome (PSO)

1. To develop a profound understanding, cultivating the ability to analyze artworks critically, recognize cultural and historical contexts and articulate informed perspectives on artistic expressions.
2. To gain comprehensive insights into rich tapestry of Indian art, exploring diverse painting styles, cultural influences and significant artistic movements.

Course Outcome (CO)

1. Apply theoretical knowledge of principles and concepts of Fine arts to practicalproblems.
2. Enhance skills to understand the concepts of principles, terminology of art andaesthetics.
3. Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.

Course Outcomes

Semester- I

FIN-109: Art Appreciation& History of Indian Paintings (Theory)

FIN-109P: Still Life and Landscape Painting (Practical)

1. To understand the historical evolution and artistic nuances within rich tradition
2. To gain comprehensive insights into rich tapestry of Indian art, exploring diverse painting styles, cultural influences and significant artistic movements.
3. To achieve a high level of skill, empowering to pursue a successful career as a professional artist or enhance employability in the creative industry.
4. Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
5. Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effectivework.

Course Outcomes

Semester- II

FIN-209: History of Indian Sculptures (Theory)

FIN-209P: Poster/Calligraphy and Head Study (Practical)

1. To develop a profound understanding, cultivating the ability to analyze artworks critically, recognize cultural and historical contexts, and articulate informed perspectives on artistic expressions.
2. To understand the historical evolution and artistic nuances within the rich tradition
3. Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
4. Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for effective work.

Course Outcomes

Semester- III

FIN-309: History of Indian Sculptures & Art Aesthetics (Theory)

FIN-309P: Head Study and Landscape/ Composition (Practical)

1. To understand the historical evolution and artistic nuances within the rich tradition.

2. Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
3. Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for effective work.

Course Outcomes

Semester- IV

FIN-409: History of Indian Miniature Painting (Theory)

FIN-409P: Life Drawing and Poster (Practical)

1. To gain comprehensive insights into rich tapestry of Indian art, exploring diverse painting styles, cultural influences and significant artistic movements.
2. To develop a profound understanding, cultivating the ability to analyze artworks critically, recognize cultural and historical contexts and articulate informed perspectives on artistic expressions.
3. To understand the historical evolution and artistic nuances within the rich tradition
4. Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
5. Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for effective work.

Course Outcomes

Semester- V

FIN-509: History of Indian painting (modern Period) and Aesthetics (Theory)

FIN-409P: Life Drawing and Landscape/Composition (Practical)

1. To develop a nuanced understanding of the dynamic period in Indian art history.
2. To enhance critical thinking, cultural awareness, visual literacy skills and a broader perspective in professional contexts.
3. Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
4. Students will be able to develop their observation, imagination, creation and

develop skills and sensitivity towards the use of visual elements for effective work.

Course Outcomes

Semester- VI

FIN-609: History of Important Movements in Europe (Theory)

FIN-609P: Life Drawing and Advertisement (Practical)

1. Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.
2. To impart knowledge of theoretical perspectives of art.
3. The range of experience covers two- and three-dimensional forms both the point of view of specially defined structural problems and their social and historic significance.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

DEPARTMENT OF GEOGRAPHY

Session: 2023-2024

Undergraduate department

Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the various Programs offered by the department.

Program Name: B.A.

Course Name: Geography

Program outcomes:

1. Students should acquire a strong foundation in geographic concepts, theories, and principles, including the study of Earth's physical features, human societies, and their interactions.
2. Geography programs often emphasize fieldwork and research, and students should learn to design, conduct, and analyses geographic research projects.
3. Students should gain an understanding of environmental issues and sustainability, including the impact of human activities on the natural environment.
4. Geography programs often explore cultural diversity, globalization, and the ways in which cultures interact and shape the world.
5. Students should become proficient in cartographic techniques and the creation of maps and other Geo spatial visualizations.
6. Geography programs aim to develop critical thinking and problem-solving skills, encouraging students to analyses complex issues and make informed decisions.
7. Students should be able to present their findings and ideas clearly, both in writing and verbally.
8. Depending on the program, students may develop expertise in specific regions or areas of the world, including the study of regional geography.

9. Geography often intersects with other disciplines, such as environmental science, economics, and urban planning. Students should be able to integrate geographic knowledge with other fields.

10. Geography programs often promote an understanding of global issues, ethical considerations, and social justice in the context of geographical research and practice.

11. Geography programs may include career development components, helping students prepare for careers in various fields, including urban planning, environmental management, education, and more.

Program Specific Outcomes

Program Specific Outcomes (PSOs) in the context of a geography program typically refer to the specific knowledge, skills, and abilities that students are expected to acquire or demonstrate upon completing their geography education. These PSOs are often designed to align with the overall goals and objectives of the program. The specific PSOs for a geography program can vary depending on the educational institution and the level of the program. Here are some common PSOs for a geography program:

1. Students should have a deep understanding of global and regional geography, including physical geography (landforms, climate, ecosystems), human geography (population, culture, urbanization), and regional geography.

2. Students should be able to design and conduct geographic research projects, including data collection, analysis, and interpretation.

3. Students should be able to assess and address environmental challenges and promote sustainability through the application of geographic knowledge and principles.

4. Students should be skilled in creating and interpreting maps, including thematic maps, topographic maps, and interactive web maps.

5. Students should have experience in conducting fieldwork, including data collection, surveys, and observations in various geographic settings.

6. Students should be able to think critically and apply geographic concepts to solve real-world problems and make informed decisions.

7. Students should be able to work effectively with professionals from other disciplines to address complex geographic issues.

8. Students should understand the social and cultural factors that influence geographical patterns and processes.

9. Students should be able to communicate their geographic knowledge and research findings effectively through written reports, presentations, and other forms of communication.

These PSOs are typically designed to ensure that graduates of a geography program have a well-rounded and comprehensive skill set that prepares them for various career opportunities, including roles in environmental management, urban planning, geographic information science, education, and more. The specific PSOs may vary from one educational institution to another and may be tailored to meet the unique goals and priorities of the program.

COURSE OUTCOMES

SEMESTER-I

GEO-111: GEOMORPHOLOGY

1. Students can also Understand and articulate fundamental concepts in geomorphology, including the principles of landform development, factors influencing geomorphic processes, and the dynamic nature of Earth's surface.

2. Students can also identify and classify major landforms, such as mountains, valleys, plains, and coastal

3. Students can also Integrate geomorphic knowledge with other geographical sub-disciplines, considering the interplay of physical, human, and environmental factors.

4. They are also know about evaluate geomorphological hazards, such as landslides, floods, and coastal erosion, and assess their implications for human settlements and infrastructure.

SEMESTER-II

GEO-211: Climatology and Oceanography

1. This course is designed to provide the candidates a good understanding about the atmospheric and oceanographic phenomenon.

2. The study of Elements of Climate and the factors influencing the distribution of temperature and pressure are the key aspects covered. Apart from that the Heat budget, Insolation, Air masses, Fronts, Ocean currents are other interesting topics which enlighten the candidates to have a complete picture about the atmosphere and hydrosphere. This paper also explains how closely these two are associated with each other to determine the world climate and there by the life on this earth.

SEMESTER-III

GEO-311: GEOGRAPHY OF INDIA

1. This course on the Geography of India assumes' that the students are familiar with the basic landforms, climate, soil, vegetation and population characteristics of India.

2. It is a course designed to enable students to broaden and deepen their understanding of India.

SEMESTER IV

GEO-411: GEOGRAPHY OF PUNJAB

1. This course on the Geography of India assumes' that the students are familiar with the basic landforms, climate, soil, vegetation and population characteristics of Punjab.

2. It is a course designed to enable students to broaden and deepen their understanding of Punjab.

SEMESTER-V

GEO-511: REGIONAL GEOGRAPHY-I

1. Students would gain understanding of 'new' geography of World.
2. Students understand some of the political, economic, cultural, physical, social, and philosophical aspects of one or more of the world's nations, peoples and cultures outside the country.
3. Students recognize the role of national and international diversity in shaping their own attitudes and values as global citizens.

SEMESTER-VI

GEO-611: REGIONAL GEOGRAPHY-II

1. Students would gain understanding of 'new' geography of World.
2. Students understand some of the political, economic, cultural, physical, social, and philosophical aspects of one or more of the world's nations, peoples and cultures outside the country.
3. Students recognize the role of national and international diversity in shaping their own attitudes and values as global citizen.

PG DEPARTMENT OF GURMAT SANGEET AND MUSIC VOCAL

SESSION: 2023-2024

Under Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: BA

Course Name: MUSIC VOCAL **(Elective)**

B.A. (MUS)-117: MUSIC VOCAL

Course objectives:

- To introduce various definitions in the context of Indian Classical Music.
- To impart knowledge about Historical development of Indian Classical Music.
- To aware the students about brief knowledge of different musicians, Raag and Taals

Course learning outcomes:

- The student will be learning about the historical background, musical terms, and role of music in humanlife and contribution of different musicologist in the field of music.
- The students will also know about the different Raags and Taals, and how Instruments are used.

B.A. (MUS) - 217: MUSIC VOCAL

Course objectives:

- To introduce various definitions in the context of Indian Classical Music.
- To impart knowledge about Historical development of Indian Classical Music.
- To aware the students about brief knowledge of different musicians, Raag and Taals

Courselearning outcomes:

- The student will be learning about the historical background, musical terms, and role of music in humanlife and contribution of different musicologist in the field of music.
- The students will also know about the different raags and taals, and how Instruments are used.

B.A. (MUS) - 317: MUSIC VOCAL

Course objectives:

- To introduce various definitions in the context of Indian Classical Music.
- To impart knowledge about Historical development of Indian Classical Music.
- To aware the students about brief knowledge of different musicians, Raag and Taals.

Course learning outcomes:

- The student will be learning about the historical background, musical terms, and role of music inhuman life and contribution of different musicologist in the field of music.

- The students will also know about the different Raags and Taals, and how Instruments are used.

B.A. (MUS) - 417: MUSIC VOCAL

Course objectives:

- To introduce various definitions in the context of Indian Classical Music.
- To impart knowledge about Historical development of Indian Classical Music.
- To aware the students about brief knowledge of different musicians, Raag and Taals.

Courselearning outcomes:

- The student will be learning about the historical background, musical terms, and role of music inhuman life and contribution of different musicologist in the field of music.
- The students will also know about the different Raags and Taals, and how Instruments are used.

B.A. (MUS)-517: MUSIC VOCAL

Course objectives:

- To introduce various definitions in the context of Indian Classical Music.
- To impart knowledge about Historical development of Indian Classical Music.
- To aware the students about brief knowledge of different musicians, Raag and Taals Notation system.

Course learning outcomes:

- The student will be learning about the historical background, musical terms, and role of music inhuman life and contribution of different musicologist in the field of music.
- The students will also know about the different raags and taals, and how Instruments are used.

B.A. (MUS) - 617: MUSIC VOCAL

Course objectives:

- To introduce various definitions in the context of Indian Classical Music.
- To impart knowledge about Historical development of Indian Classical Music.
- To aware the students about brief knowledge of different musicians, Raag and Taals.

Course learning outcomes:

- The student will be learning about the historical background, musical terms, and role of music in humanlife and contribution of different musicologist in the field of music.
- The students will also know about the different Raags and Taals, and how Instruments are used.

B.A. (GUR) - 116: GURMAT SANGEET

Course Objectives:

- To introduce various definitions in the context of Gurmat Sangeet and Indian Classical Music.
- To impart knowledge about historical development of Gurmat Sangeet.
- To aware the students about brief biographical sketches of different Sikh Guru Sahibaan.
- To increase the knowledge about different Raags of Sri Guru Granth sahib and different Taals.

Course Learning Outcomes:

- The student will be learning about the historical background, musical terms, and role of music inhuman life and contribution of different musicologist in the field of music.
- The students will also know about the different Raags and Taals and how Instruments are used.

B.A. (GUR) – 216: GURMAT SANGEET

Course Objectives:

- To introduce various definitions in the context of Gurmat Sangeet and Indian Classical Music.
- To impart knowledge about historical development of Gurmat Sangeet.
- To aware the students about brief biographical sketches of different Sikh Guru Sahibaan.
- To increase the knowledge about different Raags of Sri Guru Granth sahib and different Taals.

Course learning Outcomes:

- The student will be learning about the historical background, musical terms, and role of music inhuman life and contribution of different musicologist in the field of music.
- The students will also know about the different Raags and Taals and how Instruments are used.

B.A. (GUR) - 316: GURMAT SANGEET

Course Objectives:

- To introduce various definitions in the context of Gurmat Sangeet and Indian Classical Music.
- To impart knowledge about historical development of Gurmat Sangeet to aware the students about brief biographical sketches of different Sikh Guru Sahibaan.
- To increase the knowledge about different raags of Sri Guru Granth sahib and different taals.

Course Learning Outcomes:

- The student will be learning about the historical background, musical terms, role of music inhuman life and contribution of different musicologist in the field of music.
- The students will also know about the different Raags and Taals, and how Instruments areused.

B.A. (GUR) - 416: GURMAT SANGEET

Course Objectives:

- To introduce various definitions in the context of Gurmat Sangeet such as: Raag, Rahao, Ank, Dhuni etc.
- To impart knowledge about various gayan shaillies of Gurmat Sangeet. □ To increase the knowledge about Notation system of Gurmat Sangeet.

Course Learning Outcomes:

- The student will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of music.
- Thestudents will also know about the different Raags and Taals, and how Instruments are used.

B.A. (GUR) - 516: GURMAT SANGEET

Course objectives:

- To introduce various definitions in the context of Gurmat Sangeet and Indian Classical Music.
- To impart knowledge about historical development of Gurmat Sangeet.
- To aware the students about brief biographical sketches of different Sikh Guru Sahibaan.
- To increase the knowledge about different Raags of Sri Guru Granth sahib and different Taals.

Course learning outcomes:

- The student will be learning about the historical background, musical terms, and role of music inhuman life and contribution of different musicologist in the field of music.
- The students will also know about the different Raags and Taals and how Instruments areused

B.A. (GUR) - 616: GURMAT SANGEET

Course objectives:

- To introduce various definitions in the context of Gurmat Sangeet and Indian ClassicalMusic.
- To impart knowledge about historical development of Gurmat Sangeet to aware the studentsabout brief biographical sketches of different Sikh Guru Sahibaan.

- To increase the knowledge about different raags of Sri Guru Granth sahib and different taals.

Course learning outcomes:

- The student will be learning about the Historical background, musical terms, and role of musicin human life and contribution of different musicologist in the field of music.
- The students will also know about the different Raags and Taals and how Instruments areused.

DEPARTMENT OF HINDI

SESSION: 2023-24

Under Graduate Courses

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the Programmes

Program Name: BA

Course Name: HINDI

PROGRAMME OUTCOMES (POs)

DEPARTMENT OF HINDI	**After Successful Competion of three Year UG Degree Programe in Hindi A Student should be Able To:-**
PROGRAM OUTCOMES	**PO 1:-** छात्रों को हिन्दी साहित्य के विभिन्न विधाओं, प्रवृतियों, रचनाओं एवं रचनाकारों का परिचय प्राप्त होगा।
	PO 2:- छात्रों को भारतीय एवं पाश्चात्य साहित्यशास्त्र का सैद्धांतिक ज्ञान प्राप्त होगा।
	PO 3:- समीक्षात्मक दृष्टिकोण विकसित होगा।
	PO 4:- छात्रों में हिन्दी साहित्य के अध्ययन से उनके नैतिक मूल्यों, राष्ट्रीय मूल्यों तथा सामाजिक मूल्यों में अभिवृद्धि होगी।
	PO 5:- छात्रों को शासकीय कार्यालयों में अनुपयुक्त कार्यलीय हिन्दी भाषा का परिचय होगा।
	PO 6:- हिन्दी भाषा और उसकी विविध बोलियो के विकास के संबंध में ज्ञान प्राप्त

	होगा।
	PO 7:- विभिन्न भारतीय साहित्य का परिचयात्मक ज्ञान प्राप्त होगा।
	PO 8:- खोज करने की क्षमता का निर्माण होगा।

Course Outcomes: B.A 1 Hindi 1st & 2nd Semester

DEPARTMENT OF HINDI	**After Completion of these courses students should be Able to:-**
COURSE OUTCOMES	CO 1:- छात्रों को प्राचीन हिन्दी काव्य के विभिन्न स्वरूपों एवं प्रवृतियों का ज्ञान होगा।
	CO 2:- छात्र कबीर, जायसी, सूर, तुलसी और गुरु नानक के काव्य से परिचित होंगे।
	3. छात्रों में भक्ति एवं संत काव्य की समीक्षात्मक दृष्टिकोण का विकास होगा।
	4. छात्रों में उपन्यास की तात्विक समीक्षा क्षमता का विकास होगा।
	5. छात्रों को मुहावरों एवं व्यावहारिक व्याकरण से परिचित करवाना।
	6. छात्रों में कहानियों तथा नाटक के तात्विक समीक्षा क्षमता का विकास होगा।
	7. छात्र 'कबिरा खड़ा बाजार में' नाटक के माध्यम से तदयुगीन समस्याओं एवं भाषा से परिचित होगें।

Course Outcomes: B.A 2nd Hindi 3rd & 4th Semester

DEPARTMENT OF HINDI	**After Completion of these courses students should be Able to:-**
COURSE OUTCOMES	CO 1:- छात्रों में विभिन्न कालों के साहित्य के प्रति जिज्ञासा तथा ज्ञान का प्रसार होगा।
	2. छात्रों को हिन्दी भाषा के विविध रूपों एवं बोलियो का परिचय प्राप्त होगा।
	3. छात्र हिन्दी भाषा के स्वरूप व विकास की अवधारणा से परीचित होंगे।
	4. छात्रों को हिन्दी साहित्य के इतिहास का ज्ञान होगा।
	5. छात्रों में हिन्दी शब्द भंडार के संबंध में विविध शब्दावली का ज्ञान प्राप्त होगा।
	6. छात्रों में जयशंकर प्रसाद की कहानियों के विविध स्वरूपों के माध्यम से मानवीय संवेदनाओं का विकास होगा।
	7. छात्र आधुनिक हिन्दी काव्य के विभिन्न आंदोलन से परिचित होगें।
	8. छात्रों को अलंकारों का ज्ञान प्राप्त होगा।
	9. छात्रों में हिन्दी उपन्यास तथा एकांकी विधा की तात्विक समीक्षा दृष्टि का विकास होगा।

Course Outcomes: B.A 3rd Hindi 5th & 6th Semester

DEPARTMENT OF HINDI	**After Completion of these courses students should be Able to:-**
COURSE OUTCOMES	CO 1. छात्रों में हिन्दी साहित्य का इतिहास में आधुनिक काल की नवीन विधाओं के ज्ञान का प्रसार होगा।
	2. नवीन विधाओं का सैद्धातिक विवेचनात्मक परिचय प्राप्त होगा।
	3. छात्रों में महादेवी वर्मा एवं प्रसाद के साहित्य के प्रति रूचि एवं ज्ञान का प्रसार

	होगा।
	4. छात्र काव्य के स्वरूप एवं प्रयोजन से परिचित होंगे।
	5. छन्दों का परिचय तथा ज्ञान प्राप्त होगा।

विषयः हिन्दी साहित्य

कोर्स आऊटकम (पाठ्यक्रम उपलब्धि)

बी.ए. प्रथम

इस पाठ्यक्रम से विद्यार्थी हिन्दी साहित्य के इतिहास का आधारभूत (Basic) ज्ञान प्राप्त करने में सक्षम होते हैं। आधुनिक कविता की विस्तृत जानकारी प्राप्त करने के साथ साहित्य की विधाओं कहानी तथा उपन्यास के विषय में भी ज्ञान अर्जित करते हैं। इसके अतिरिक्त समसामयिक विषयों पर अपने विचार प्रकट करने से उनकी लेखन कला में सुधार होता है।

बी.ए. द्वितीय

इस पाठ्यक्रम से विद्यार्थी हिन्दी साहित्य के इतिहास का विस्तृत ज्ञान हासिल करते हैं। साहित्य की विधाओं एकांकी तथा उपन्यास की रचना प्रक्रिया को समझते हैं। इसके अतिरिक्त हिन्दी भाषा की उत्पत्ति, विकास तथा विभिन्न रूपों की विस्तृत जानकारी हासिल करते हैं।

बी. ए. तृतीय

इस पाठ्यक्रम से विद्यार्थी हिन्दी साहित्य के इतिहास का सम्पूर्ण ज्ञान हासिल करते हैं। हिन्दी साहित्य की नवीन विधाओं रेखाचित्र, संस्मरण, जीवनी तथा आत्मकथा आदि का विस्तृत ज्ञान अर्जित करते हैं। इसके अतिरिक्त छन्दों के माध्यम से कविता रचना की प्रक्रिया को भी समझते हैं।

प्रोग्राम आऊटकम (प्रोग्राम उपलब्धियाँ)

हिन्दी साहित्य का विषय पढ़ने वाले विद्यार्थी स्कूलों तथा कॉलेजों में हिन्दी शिक्षक के तौर पर कार्य कर सकते हैं। सरकारी तथा प्राइवेट बैंकों में हिन्दी ऑफिसर की नौकरी हासिल कर सकते हैं। इसके अतिरिक्त सरकारी, अर्द्धसरकारी, प्राइवेट संस्थानों तथा बैंकों में अनुवादक के तौर पर भी कार्य कर सकते हैं।

विषयः हिन्दी साहित्य

कोर्स आऊटकम (पाठ्यक्रम उपलब्धि)

बी.ए. प्रथम

इस पाठ्यक्रम से विद्यार्थी हिन्दी साहित्य के इतिहास का आधारभूत (Basic) ज्ञान प्राप्त करने में सक्षम होते हैं। आधुनिक कविता की विस्तृत जानकारी प्राप्त करने के साथ साहित्य की विधाओं कहानी तथा उपन्यास के विषय में भी ज्ञान अर्जित करते हैं। इसके अतिरिक्त समसामयिक विषयों पर अपने विचार प्रकट करने से उनकी लेखन कला में सुधार होता है।

बी.ए. द्वितीय

इस पाठ्यक्रम से विद्यार्थी हिन्दी साहित्य के इतिहास का विस्तृत ज्ञान हासिल करते हैं। साहित्य की विधाओं एकांकी तथा उपन्यास की रचना प्रक्रिया को समझते हैं। इसके अतिरिक्त हिन्दी भाषा की उत्पत्ति, विकास तथा विभिन्न रूपों की विस्तृत जानकारी हासिल करते हैं।

बी. ए. तृतीय

इस पाठ्यक्रम से विद्यार्थी हिन्दी साहित्य के इतिहास का सम्पूर्ण ज्ञान हासिल करते हैं। हिन्दी साहित्य की नवीन विधाओं रेखाचित्र, संस्मरण, जीवनी तथा आत्मकथा आदि का विस्तृत ज्ञान अर्जित करते हैं। इसके अतिरिक्त छन्दों के माध्यम से कविता रचना की प्रक्रिया को भी समझते हैं।

प्रोग्राम आऊटकम (प्रोग्राम उपलब्धियाँ)

- हिन्दी साहित्य का विषय पढ़ने वाले विद्यार्थी स्कूलों तथा कॉलेजों में हिन्दी शिक्षक के तौर पर कार्य कर सकते हैं।
- सरकारी तथा प्राइवेट बैंकों में हिन्दी ऑफिसर की नौकरी हासिल कर सकते हैं।
- सरकारी, अर्द्धसरकारी, प्राइवेट संस्थानों तथा बैंकों में अनुवादक के तौर पर भी कार्य कर सकते हैं।
- हिन्दी भाषा का उचित ज्ञान होने पर रेडियो तथा टेलीविज़न पर समाचार वाचक के रुप कार्य कर सकते हैं।
- विभिन्न हिन्दी समाचार पत्र/पत्रिकाओं में अनुच्छेद लेखन/ब्लॉग तथा समसामयिक विषयों पर ज्ञानवर्धक अनुबन्ध लेखन का कार्य कर सकते है।

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

Department of Journalism and Mass Communication

Session: 2023-24

Under Graduate Courses

Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs)of the various Programmes offered by the department.

Programme Name: B.A

Course Name: Journalism and Mass Communication

PROGRAMME OUTCOMES (PO's)

- Describe and explain major theories that underpin mass communication, such as agenda-setting, cultivation, framing, and media effects theories.
- Identify and analyze the structure, functions, and dynamics of different mass media systems and industries, including print, broadcast, digital, and social media.
- Develop critical thinking skills to evaluate and analyze media messages, including an awareness of media bias, stereotypes, and ethical considerations.
- Understand the historical development of mass communication and its impact on society, including key milestones and technological advancements.
- Examine the role of journalism in informing the public, its ethical responsibilities,and the challenges it faces in the contemporary media landscape.
- Explore the reciprocal relationship between media and society, considering issues of power, representation, and the influence of media on cultural, social, and political contexts.

PROGRAMME SPECIFIC OUTSOME

- Develop basic skills in media writing, including news reporting, feature writing, and understanding the principles of effective communication.
- Understand the ethical considerations and responsibilities of media professionals, including issues related to accuracy, fairness, and accountability.
- Explore the impact of technological advancements on media production, distribution, and consumption, including the rise of digital media and socialnetworking.
- Examine the globalization of media and its implications on culture, information flow,and the shaping of a global public sphere.

- Analyze the relationship between mass media and popular culture, exploring how media Influence sand reflects societal norms, values, and trends.
- Develop skills in critically analyzing and effectively communicating ideas related to mass communication, both in written and oral forms.

COURSE OUTCOMES

Semester-I

B.A. (JMC) - 118 Introductions and Mass Communication

Outcomes

- Have an appreciation of related applications of communication in real-life.
- Understand and create different models of communication through observation of communication processes in different settings and contexts.
- Analyze the various theories of media under different political systems of the world.
- Demonstrate an understanding of the why and how of developing theories and modelsof Mass Communication.

Semester-II

BA (JMC) - 218 Growths and Development Of Print Media

Outcomes

- Students will be able to understanding news values:
- They also know about news gathering techniques:
- Develop effective interviewing skills for both news and feature stories, including preparing questions, conducting interviews, and managing sources.

Semester-III

B.A (JMC) - 318 Reporting And Feature Writing

Outcomes

- Students will be able to understanding news values:
- They also know about news gathering techniques:
- Develop effective interviewing skills for both news and feature stories, including Preparing questions, conducting interviews and managing sources.

Semester-IV

B.A (JMC) - 418 Editing and Editorial Writing

Outcomes

- Students will able to editing involves reviewing and revising written content to improve clarity, coherence, and overall quality. Editorial writing, on the other hand, refers to the creation of opinion pieces, articles, or essays that express the author's viewpoint on a particular topic.

Semester –V

BA (JMC) 518 Broadcasting Journalism

Outcomes

- Develop proficiency in using broadcast equipment, including cameras, microphones, editing software, and other relevant technologies.
- Develop skills in writing scripts for various broadcast formats, including news packages, interviews, and feature stories. Learn the importance of storyboarding for visual storytelling.
- Develop effective interviewing techniques for broadcast journalism, includingconducting interviews for news features and live reporting.
- Build a portfolio showcasing a variety of broadcast journalism work, including news packages, feature stories, and other relevant projects

Semester –VI

BA (JMC) 618 New Media

Outcome

- Distinction between new and old media is not always rigid, as traditional media outlets have also adapted to incorporate digital technologies. The landscape continues to evolve, and new forms of media are likely to emerge as technology advances.
- Students should have opportunity to explore and experiment with different forms of creative expressions using new media technology fostering their ability to communicate Idea effectively through digital platforms.
- Students should enhance there media literacy skill enable them to critically analyze and evaluate various forms of new media content including social media online journalism digital advertising and multimedia story telling.

- On the course student may develop technical skills in areas such as graphicdesigns video production audio editing web developing or social media management among other.

DEPARTMENT OF PHYSICAL EDUCATION

Session: 2023-2024

Under graduate department

Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) of the various Programs offered by the department.

Program Name: BA

Course Name: Physical Education

Programme Outcomes (POs)

1. To develop potentialities and organize physical education programs and activities.

Programme Specific Outcomes

1. To produce quality physical education teachers for imparting instructions in the subject of physical education.

SEMESTER -I

PHE:112: **Physical Education**

Outcomes

1. The curriculum would enable the pass out to select the inherited talented children for various sports activities.
2. The pass out shall be able to orient children in schools with the fundamental skills of selected sports as per their inherited potential.
3. The pass out shall be able to devise training program for athletes engaged in different sports activities.
4. The curriculum shall enable them to officiate, supervise various sports tournaments and orient them in organizing sports events at all levels.

SEMESTER -II

PHY:212: Physical Education

Outcomes

1. The curriculum would enable the pass out to select the inherited talented children for various sports activities.
2. The pass out shall be able to orient children in schools with the fundamental skills of selected sports as per their inherited potential.

3. The pass out shall be able to devise training program for athletes engaged in different sports activities.
4. The curriculum shall enable them to officiate, supervise various sports tournaments and orient them in organizing sports events at all levels.

SEMESTER -III

PHE:312: Physical Education

Outcomes

1. The curriculum would enable the pass out students to be entrepreneur (to start their own fitness centre, gym, spa etc.) and device appropriate fitness program for different genders and age groups of people.
2. The curriculum would enable the pass out to devise training program for physically challenged peoples.
3. Creating a stress free environment as stress is the biggest inhibitors of brain development.

SEMESTER -IV

PHE:412: Physical Education

Outcomes

1. Reorienting students understanding of the brain like an organ that can be developed just like a muscle developed and shaped through weight training exercises.
2. Giving constructive feedback as learning from mistakes is an important aspect of cognitive development.
3. New ideas and innovations will be encouraged.
4. Breaks in learning with recreational and other constructive activities of interest will be initiated for boosting creativity, cognitive functions and social skills.

SEMESTER -V

PHE:512: Physical Education

Outcomes

1. The curriculum would enable the pass out to select the inherited talented children for various sports activities.
2. The pass out shall be able to orient children in schools with the fundamental skills of selected sports as per their inherited potential.

3. The pass out shall be able to devise training program for athletes engaged in different sports activities.
4. The curriculum shall enable them to officiate, supervise various sports tournaments and orient them in organizing sports events at all levels.

SEMESTER -VI

PHE:612: Physical Education

Outcomes

1. The curriculum would enable the pass out to select the inherited talented children for various sports activities.
2. The pass out shall be able to orient children in schools with the fundamental skills of selected sports as per their inherited potential.
3. The pass out shall be able to devise training program for athletes engaged in different sports activities.

SRI GURU TEG BAHADUR KHALSA COLLEGE

Sri Anandpur Sahib, Distt. Rupnagar (Punjab) 140118

An Autonomous (Grant in Aid) College

Website: www.sgtbcollege.org.in | E-Mail: sgtbkc@sgtbcollege.org.in | Phone: 01887–232037

DEPARTMENT OF RELIGIOUS STUDIES
SESSION: 2023-24

Under Graduate Course

Programme outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (Cos) of the Programmes.

Programme Name: BA

Course Name: Religious Studies (Elective)

Programme Outcomes

The department of Religious studies with its graduate programme, intends to preserve further and disseminate the various aspects and forms of religious education and knowledge of religious traditions in modern perspectives. The programme aims at equipping enabling future researchers with the fundamental concepts, theories and practices of different religions knowledge domains. To empower the students with modern and scientific tools, inter – religious approach and to design such modules to help them in becoming good citizens are some of the main objectives of the course.

Programme Specific Outcomes

1. It helps the students develop an understanding of themselves and others.
2. It promotes the spiritual, moral, social and cultural development of individuals and of groups and communities.
3. Course will help to develop complex reading, writing and research skills.
4. Students will be able to express knowledge to interfaith and communal harmony in the society.
5. Students will manifest the knowledge of ‘best practices’ regarding, research, writing, teaching and the academic profession of religious academic studies.
6. Students will reveal an appreciation for literary theory.

Course Outcomes

Semester-I

BA (REL) 115: Sikh Religion

To analyze the Gurus messages of Compassion, selfless service and community engagements.

Semester-II

BA (REL) 215: Indian Religion

Delving into the Inter-faith dynamics and contemporary issues related to religion in the country.

Semester-III

BA (REL) 315: Sematic Religion

Delving into the lives and teachings of Hazrat Moses, Jesus, Zartushat and Hazrat Mohammad and insights into the religious movements and reforms within these traditions.

Semester-IV

BA (REL) 415: Medieval and Modern Religious Movements

Focus on Social Justice, Inter-faith dialogue and religious teachings to contemporary issues.

Semester-V

BA (REL) 515: Primitive Religion: Religious Rituals and Objectives

To encompasses survival, communal well-being and the quest for meaning within the context of their understanding of the religion.

Semester-VI

BA (REL) 615: Sikh Religion Principles and Institutions

To inculcate the lead a life dedicated to truthful living, earning and honest living and serving humanity.