Department of Computer Science

BCA

Programme Outcomes

The program focuses on the skill enhancement of students in which following skills are enhanced.

- Improve their computer literacy, their basic understanding of operative systems and a working. Knowledge of software commonly used in academic and professional environments.
- Knowledge of software commonly used in academic and professional environments
- Knowledge of software commonly used in academic and professional environments.
- Learn how to organize information efficiently in the forms of outlines, charts, etc. by using appropriate software. Develop the skills to present ideas effectively and efficiently.
- Do Academic and Professional Presentations - Designing and delivering an effective presentation and developing the various IT skills to the electronic databases.
- Develop IT-oriented security issues and protocols. Design and implement a web page.
- Improve communication and business management skills, especially in providing technical support. Serve as the System Administrators with thorough knowledge of DBMS.
- Understand, analyse and develop computer programmes in the areas related to algorithms, web design, mobile application design.
- Apply standard software engineering process and strategies in software project development using open source programming environment to deliver a quality product for business success.
- To demonstrate advanced skills in effective analysis design and realization of business system utilizing contemporary information technology.

This program fit the students for following job role

- Software Developer
- Network Engineer
- Web Developer
- Programmer
- Software Tester
- System Analyst

COURSE OUTCOMES

COURSE NAME: Fundamentals of Information Technology

CLASS - BCA SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Use systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems.

COURSE NAME: Programming Fundamentals using C

CLASS – BCA SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:** On successful completion of this subject the students have the programming ability in C Language.
- **Intellectual Cognitive/ Analytical Skills:** Enhancing Logical Thinking and Reasoning Skills through Collaborative Learning in C Programming.
- **Practical Skills:** Students would be capable of developing various applications to solve deluge of real-world problems. They can also learn to make system software as well as application software. These existing languages could become base for developing new languages which can inherent its features. On the backend of various embedded systems, these languages are deployed.
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

Semester-2

COURSE NAME: Digital Electronics

CLASS – BCA SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Convert numbers from one number system to another.
- Represent information using Binary Codes.
- Draw Logic circuit Diagrams and write Truth Tables for the functions.
- Solve and minimize expressions of Boolean algebra.
- Draw Combinational Circuits and Sequential Circuits.
- Perform address selection in semiconductor memory chips.

COURSE NAME: Data Structures

CLASS - BCA SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:**
  - Define basic, static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms.
  - Demonstrate advantages and disadvantages of specific algorithms and data structures
  - Select basic data structures and algorithms for autonomous realization of simple programs or program parts
  - Determine and demonstrate bugs in program, recognize needed basic operations with data structures
  - Formulate new solutions for programming problems or improve existing code using learned algorithms and data structures,
  - Evaluate algorithms and data structures in terms of time and memory complexity of basic operations.
- **Intellectual Skills:**
  - Ability to define the computer science problems.
  - Ability to drive different solution alternatives for the computer science problems.
  - Ability to analyze the solution alternatives and choose the optimum one
- **Practical Skills:**
  - Design, build and develop programs of varying levels of complexity.
- **Transferable Skills:** Knowledge of the concepts and material presented in this course will provide the students with the capability to:
  - Use data structures effectively to solve practical problems.
  - Write and present effective computer programs that employ efficient algorithms.
  - Work in stressful environment and within constraints.
  - Search for information and adopt life-long self-learning

Semester-3

COURSE NAME: Fundamentals of Database Management System

CLASS - BCA SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge & Understanding :** Databases and their design & development
- **Intellectual Cognitive/ analytical skills:** Normalization of Databases.
- **Practical Skills :**Using SQL and PL/SQL
- **Transferable skills:** Usage of DBMS design and administration.

COURSE NAME: Computer System Organization and Architecture

CLASS - BCA SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
  - Students will know about registers, various types of registers and interfacing various registers.
  - Students will learn about the architecture of common bus system.
  - Students will learn about the different micro-operations used.
  - Students will learn about Design of basic computer.
  - Students will learn about Instruction Cycle, Interrupt Cycle.
  - Students will understand about various kinds of memories used, memory hierarchy.
  - Students will teach about I/O interface, DMA controller, modes of data transfer.
  - Students will learn about difference between pipeline and vector processing.

COURSE NAME: Object Oriented Programming using C++

CLASS - BCA SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
  - Able to know how to do programming in C++ environment.
  - Able to understand and implement the concepts of object oriented approach using C++.
  - Able to acquire in depth knowledge and develop software in C++
- **Intellectual (Cognitive/ Analytical) Skills:**
  - identify different class attributes, member functions, base class and derived class and their relationships among them
  - learn how to reuse the code using polymorphism
  - understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
  - To solve a real life existing problems using the features of C++
  - To develop software/ big and complex programs for a complex problems
  - Implement advance features of object oriented approach in other various language(s).

Semester 4

COURSE NAME: Computer Networks

CLASS - BCA SEMESTER – 4

Course Outcomes

After studying this course:

- Students will know what are network and its types.
- Students will learn about the different topologies used in network.
- Students will understand different protocols used in internet.
- Students will understand and be able to describe the differences between intranet, extranet and internet.
- Students will understand about various multiplexing and switching techniques used in networks.

COURSE NAME: Management Information System

CLASS - BCA SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Relate the basic concepts and technologies used in the field of management information systems;
- Compare the processes of developing and implementing information systems.
- Outline the role of the ethical, social, and security issues of information systems. 4. Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.
- Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

COURSE NAME: Relational Database Management Systems with Oracle

CLASS – BCA SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Apply the basic concepts of Database Systems and Applications.
- Use the basics of SQL and construct queries using SQL in database creation and interaction.
- Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.
- Analyze and Select storage and recovery techniques of database system.

Semester5

COURSE NAME: System Analysis and Design

CLASS - BCA SEMESTER – 5

- **Knowledge and Understanding:**
  - Understand the principles and tools of systems analysis and design
  - Understand the application of computing in different context
  - Understand the professional and ethical responsibilities of practicing the computer professional including understanding the need for quality
- **Intellectual (Cognitive/ Analytical) Skills:**
  - Solve a wide range of problems related to the analysis, design and construction of information systems - Analysis and Design of systems of small sizes

Course Outcomes

After studying this course, students should be able to:

COURSE NAME: System Software

CLASS - BCA SEMESTER – 5

Course Outcomes

After studying this course, students should able to:

- Understand the functions, features and design options of macro processors.
- Understand the functions and design options of loader, editor structure and functions and capabilities of an interactive debugging system.
- Analyze the working of Lexical analyzer (LEX) and Parser tool (YACC)
- Understand the proficiency in software development cost estimation, testing methodologies and author a software testing plan.

COURSE NAME: Java Programming

CLASS - BCA SEMESTER – 5

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
  - Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
  - Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- **Intellectual (Cognitive/ Analytical) Skills:**
  - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.

- Understand use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.

- **Practical Skills:**
  - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
  - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
  - Develop computer-based systems.

COURSE NAME: Web Designing using HTML and DHTML

CLASS - BCA SEMESTER – 5

Course Outcomes

After studying this course, students should be able to:

- Use knowledge of HTML and CSS code and an HTML editor to create websites
- Use critical thinking skills to design and create websites.
- Create online forms
- Publish website to the web

Semester-6

COURSE NAME: E-Commerce

CLASS - BCA SEMESTER – 6

Course Outcomes

After studying this course, students should be able to:

- Analyze the impact of E-commerce on business models and strategy.
- Describe the major types of E-commerce.
- Explain the process that should be followed in building an E-commerce presence.
- Identify the key security threats in the E-commerce environment.
- Describe how procurement and supply chains relate to B2B E-commerce.

COURSE NAME: Operating Systems

CLASS - BCA SEMESTER – 6

Course Outcomes

After studying this course, students should be able to:

- Describe the important computer system resources and the role of operating system in their management policies and algorithms.
- Understand the process management policies and scheduling of processes by CPU
- Evaluate the requirement for process synchronization and coordination handled by operating system
- Describe and analyze the memory management and its allocation policies.
- Identify use and evaluate the storage management policies with respect to different storage management technologies.
- Identify the need to create the special purpose operating system

COURSE NAME: Software Engineering

CLASS - BCA SEMESTER – 6

Course Outcomes

After studying this course, students should be able to:

- Understanding the issues affecting the organization, planning and control of software-basedsystems development.
- Complete the analysis and design of software intensive systems.
- Read and understand the professional and technical literature on software engineering.

COURSE NAME: Web Designing using ASP.Net

CLASS - BCA SEMESTER – 6

Course Outcomes

After studying this course, students should be able to:

- To develop WebPages, Static Websites, Dynamic Websites.
- To use ASP as Server Side Scripting Language.
- To use PHP as Server Side Scripting Language.
- To use JSP, JavaScript.
- To understand database and it's connectivity with Server Side scripting language.
- To develop Web Applications with MySQL/SQL as backend.

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Budhlada (Mansa)

GURU NANAK COLLEGE BUDHLADA

B.Voc(Cyber Security)

Program Outcomes

The program focuses on the skill enhancement of students in Cyber Security in which following skills are enhanced.

- To identify, analyse and remediate computer security breaches by learning and implementing the real-world scenarios
- To provide students with a comprehensive overview of collecting, investigating, preserving, and presenting evidence of cybercrime left in digital storage devices
- To gain industrial exposure through Industrial Internship in cyber security
- To make them employable according to the current demands of cyber security and IT-oriented security issues and protocols.

This program makes the students able for following job roles:

NSQF LEVEL	Job Role
4	Junior Software Developer
5	Web Developer

COURSE OUTCOMES

COURSE NAME: Fundamentals of Computer and Cyber Security

CLASS - B.Voc. (CS) SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Use systems development, word-processing, spreadsheet, and presentation softwares to solve basic information systems problems.
- Understand the basics of cyber security

COURSE NAME: Web Designing using HTML and DHTML

CLASS - B.Voc(CS) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Use knowledge of HTML and CSS code and an HTML editor to create websites
- Use critical thinking skills to design and create websites.
- Create online forms
- Publish website to the web

COURSE NAME: Computer Programming using C

CLASS - B.Voc(CS) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:** On successful completion of this subject the students have the programming ability in C Language.
- **Intellectual Cognitive/ Analytical Skills:** Enhancing Logical Thinking and Reasoning Skills through Collaborative Learning in C Programming.
- **Practical Skills:** Students would be capable of developing various applications to solve deluge of real-world problems. They can also learn to make system software as well as application software. These existing languages could become base for developing new languages which can inherent its features. On the backend of various embedded systems, these languages are deployed.
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

Semester-2

COURSE NAME: Fundamentals of DBMS

CLASS - B.Voc(CS) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge & Understanding :** Databases and their design & development
- **Intellectual Cognitive/ analytical skills:** Normalization of Databases.
- **Practical Skills :**Using SQL and PL/SQL
- **Transferable skills:** Usage of DBMS design and administration.

COURSE NAME: Fundamentals of Cyber Security

CLASS - B.Voc(CS) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Analyze and evaluate the cyber security needs of an organization.
- Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.
- Measure the performance and troubleshoot cyber security systems.
- Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
- Design operational and strategic cyber security strategies and policies.

COURSE NAME: Programming using C++

CLASS - B.Voc(CS) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:**
  - Able to know how to do programming in C++ environment.
  - Able to understand and implement the concepts of object oriented approach using C++.
  - Able to acquire in depth knowledge and develop software in C++
- **Intellectual(Cognitive/ Analytical) Skills:**
  - identify different class attributes, member functions, base class and derived class and their relationships among them
  - learn how to reuse the code using polymorphism
  - Understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
  - to solve a real life existing problems using the features of C++
  - to develop software/ big and complex programs for a complex problems
  - Implement advance features of object oriented approach in other various language(s).

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GURU NANAK COLLEGE BUDHLADA

B.Voc. (Software Development)

Programme Outcomes

The program focuses on the skill enhancement of students in Software Development in which following skills are enhanced.

- Improve their computer literacy, their basic understanding of operative systems and working of computer. Knowledge of software commonly used in academic and professional environments.
- Do Academic and Professional Presentations - Designing and delivering an effective presentation and developing the various IT skills to the electronic databases.
- Use the Systems Analysis Design paradigm to critically analyze a problem. Solve the problems (programming networking database and Web design) in the Information Technology environment. Function effectively on terms to accomplish a common goal and demonstrate professional behaviour.
- Develop IT-oriented security issues and protocols. Design and implement a web page.
- Apply standard software engineering process and strategies in software project development using open source programming environment to deliver a quality product for business success.
- Acquaintance with latest trends in software development and thereby innovate new ideas in the area of software development.
- Conceptual grounding in computer usage as well as its practical business applications.
- To demonstrate advanced skills in the effective analysis designing and realization of business system utilizing in contemporary information technology.

This program fit the students for following job role

NSQF LEVEL	Job Role
4	Junior Software Developer
5	Web Developer
6	Master Trainer for Junior Software Developer
7	Software Developer

COURSE OUTCOMES

COURSE NAME: Fundamentals of Computer and Software Development

CLASS - B. Voc (SD) SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Use system development, word-processing, spreadsheet, and presentation softwares to solve basic information system problems.

COURSE NAME: Web Designing using HTML and DHTML

CLASS - B. Voc (SD) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Use knowledge of HTML and CSS code and an HTML editor to create websites
- Use critical thinking skills to design and create websites.
- Create online forms
- Publish website to the web

COURSE NAME: Computer Programming using C

CLASS - B. Voc (SD) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:** On successful completion of this course the students have the programming ability in C Language.
- **Intellectual Cognitive/ Analytical Skills:** Enhancing Logical Thinking and Reasoning Skills through Collaborative Learning in C Programming.
- **Practical Skills:** Students would be capable of developing various applications to solve deluge of real-world problems. They can also learn to make system software as well as application software. These existing languages can become base for developing new languages which can inherent its features. On the backend of various embedded systems, these languages are deployed.
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

Semester-2

COURSE NAME: Fundamentals of DBMS

CLASS - B. Voc (SD) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge & Understanding :** Databases and their design & development
- **Intellectual Cognitive/ analytical skills:** Normalization of Databases.
- **Practical Skills :**Using SQL and PL/SQL
- **Transferable skills:** Usage of DBMS design and administration.

COURSE NAME: Fundamentals of Windows and Server Administration

CLASS - B. Voc (SD) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Use administrative techniques and tools in Windows Server 2008.
- Implement identity Services.
- Manage network infrastructure services.
- Configure file servers and storage.
- Perform upgrades and migration related to AD DS, and storage.

COURSE NAME: Data Structure

CLASS - B. Voc (SD) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- **Knowledge and Understanding:**
  - Define basic static and dynamic data structures and relevant standard algorithms for them: stack, queue, dynamically linked lists, trees, graphs, heap, priority queue, hash tables, sorting algorithms.
  - Demonstrate advantages and disadvantages of specific algorithms and data structures,
  - Select basic data structures and algorithms for autonomous realization of simple programs or program parts
  - Determine and demonstrate bugs in program, recognize needed basic operations with data structures
  - Formulate new solutions for programming problems or improve existing code using learned algorithms and data structures,

- Evaluate algorithms and data structures in terms of time and memory complexity of basic operations.

- **Intellectual Skills:**
  - Ability to define the computer science problems.
  - Ability to drive different solution alternatives for the computer science problems.
  - Ability to analyze the solution alternatives and choose the optimum one
- **Practical Skills:**
  - Design, build and develop programs of varying levels of complexity.
- **Transferable Skills:** Knowledge of the concepts and material presented in this course will provide the students with the capability to:
  - Use data structures effectively to solve practical problems.
  - Write and present effective computer programs that employ efficient algorithms.
  - Work in stressful environment and within constraints.
  - Search for information and adopt life-long self-learning
- **COURSE NAME: Fundamentals of Computer and Software Development**

Semester-3

COURSE NAME: Software Engineering

CLASS - B. Voc (SD) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- Understanding the issues affecting the organisation, planning, and control of software-based systems' development.
- Complete the analysis and design of software intensive systems.
- Read and understand the professional and technical literature on software engineering.

COURSE NAME: Programming with Java

CLASS - B. Voc (SD) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
  - Implement Object Oriented programming concept using basic syntaxes of control structures, strings and function for developing skills of logic building activity.
  - Identify classes, objects, members of a class and the relationships among them required for a finding the solution to specific problem
- **Intellectual (Cognitive/ Analytical) Skills:**
  - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.

- Understand and use of different exception handling mechanisms and concepts of multithreading for robust faster and efficient application development.

- **Practical Skills:**
  - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
  - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
  - Develop computer-based systems.

COURSE NAME: Programming using C++

CLASS - B. Voc (SD) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
  - Able to know how to do programming in C++ environment.
  - Able to understand and implement the concepts of object oriented approach using C++.
  - Able to acquire in depth knowledge and develop software in C++
- **Intellectual (Cognitive/ Analytical) Skills:**
  - Identify different class attributes, member functions, base class and derived class and their relationships among them
  - Learn how to reuse the code using polymorphism
  - Understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
  - To solve a real life existing problems using the features of C++
  - To develop software/ big and complex programs for a complex problems
  - Implement advance features of object oriented approach in other various language(s).

Semester

COURSE NAME: Web Development using PHP and MYSQL **4**

CLASS - B. Voc (SD) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Create web applications using PHP and MySQL
- Connect PHP web application with MySQL database.
- Send and receive data to and from database.

COURSE NAME: Content Management System

CLASS - B. Voc (SD) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- create website using Joomla
- create user with different roles
- backup and restore website
- online their website

Semester5

COURSE NAME: Web Development using ASP.Net

CLASS - B. Voc (SD) SEMESTER – 5

Course Outcomes

After studying this course, students should be able to:

- To develop Web pages, Static Websites, Dynamic Websites.
- To use ASP as Server Side Scripting Language.
- To use PHP as Server Side Scripting Language.
- To use JSP, JavaScript.
- To understand database and it's connectivity with Server Side Scripting language.
- To develop Web Applications with MySQL/SQL as backend.

COURSE NAME: Software Testing Concepts and Tools

CLASS - B. Voc (SD) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
  - Design test planning.
  - Manage the test process.
- **Intellectual Cognitive/Analytical Skills**:
  - Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
  - Implement various test processes for quality improvement.
  - To handle types of errors and fault models
- **Practical Skills:**

- Use practical knowledge in various ways to test software and an understanding of some of the tradeoffs between testing techniques.
- Generate various test documents.
- Identify and apply appropriate automated testing tool.

- **Transferable Skills:**
  - Apply the software testing techniques in commercial environment.
  - Perform various types of software testing like E-commerce websites, Real time software testing, Multiplatform testing, Security Testing, Client server testing.

Semester-6

Project Dissertation (Industrial Training and Project in Software/IT industry

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PGDCA

Programme Outcomes

The program focuses on the skill enhancement of students in which following skill component are enhanced.

- To train students in the latest trends of Application Development, Programming Languages and Database Management.
- To enhance their career opportunities in the software development and maintenance sector in the state.
- To expose the students to Open Source Technologies so that they become familiar with it and can seek appropriate opportunity in trade and industry.
- To give hands on experience to students while developing real life IT application as part of the study.
- To augment the knowledge base of the students, through various activities which will be complementary to the theoretical studies.

COURSE OUTCOMES

COURSE NAME: Fundamentals of Information Technology

CLASS –PGDCA SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- understand the fundamental hardware components that make up a computer's hardware and the role of each of these components
- understand the difference between an operating system and an application program, and what each is used for in a computer
- describe some examples of computers and state the effect that the use of computer technology has had on some common products
- Use systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems.

COURSE NAME: Operating Systems

CLASS –PGDCA SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- Describe the important computer system resources and the role of operating system in their management policies and algorithms.
- Understand the process management policies and scheduling of processes by CPU

- Evaluate the requirement for process synchronization and coordination handled by operating system
- Describe and analyze the memory management and its allocation policies.
- Identify use and evaluate the storage management policies with respect to different storage management technologies.

Identify the need to create the special purpose operating system

COURSE NAME: Problem Solving using C

CLASS –PGDCA SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:** On successful completion of this subject the students have the programming ability in C Language.
- **Intellectual Cognitive/ Analytical Skills:** Enhancing Logical Thinking and Reasoning Skills through Collaborative Learning in C Programming.
- **Practical Skills:** Students would be capable of developing various applications to solve deluge of real-world problems. They can also learn to make system software as well as application software. These existing languages could become base for developing new languages which can inherent its features. On the backend of various embedded systems, these languages are deployed.
- **Transferable Skills:** In many multinational companies they can work effectively in a group or team to achieve goals and can show initiative and leadership abilities.

SEMESTER – 2

COURSE NAME: Database Management System

CLASS –PGDCA SEMESTER – 2

Course Outcomes

After studying this course, students should be able to:

- **Knowledge & Understanding :** Databases and their design & development
- **Intellectual Cognitive/ analytical skills:** Normalization of Databases.
- **Practical Skills :**Using SQL
- **Transferable skills:** Usage of DBMS design and administration

COURSE NAME: Introduction to Computer Network, Internet and E-Commerce

CLASS –PGDCA SEMESTER – 2

Course Outcomes

After studying this course,

- Students will know what is network, its types.
- Students will learn about the different topologies used in network.
- Students will understand different protocols used in internet.
- Students will understand and be able to describe the differences between intranet, extranet and internet.
- Students will understand about Commerce

COURSE NAME: Object Oriented Programming using C++

CLASS –PGDCA SEMESTER – 2

Course Outcomes

After studying this course, students should be able to:

- Write, compile and debug programs in C++language.
- Use different data types, operators and console I/O function in a computer program.
- Design programs involving decision control statements, loop control statements and case control structures.
- Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
- Comprehend the concepts of structures and classes: declaration, initialization and implementation.
- Apply basics of object oriented programming, polymorphism and inheritance.
- Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.

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GURU NANAK COLLEGE BUDHLADA, DISTT. MANSA, PUNJAB-151502

M. Sc (Information Technology)

Programme Outcomes

The program focuses on the skill enhancement of students in which following skill component are enhanced.

- Will have the ability to communicate computer science concepts, designs, and solutions effectively and professionally. Apply knowledge of computing to produce effective designs and solutions for specific problems. Identify, analyze, and synthesize scholarly literature relating to the field of computer science; and use software development tools, software systems, and modern computing platforms.
- Work in a collaborative manner with others in a team, contributing to the management, planning and implementation of a computer system.
- Independently propose a small scale research project, plan its execution, undertake its development, evaluate its outcome and report on its results in a professional manner.
- Advance knowledge through innovation and knowledge creation. Pursue life-long learning in practice. Interpret and present theoretical issues and empirical findings
- Gains understanding about techniques, technologies and methods used in managing and implementing information technology systems.
- Widens and deepens understanding of computing technologies and covers high level concepts that enable the effective management and planning of IT project and services.
- High level strategy and design in-depth technical specializations, management and planning of IT project and services.

This program fit the students for following job role:-

- Software Developer
- Hardware Engineer
- Database Engineer
- Web Developer

COURSE OUTCOMES

COURSE NAME: Introduction of Information Technology

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After studying this course, students should be able to:

- Have basic knowledge of computer hardware and software;
- Understand business areas to which computers may be applied;

- Provide an introduction to business organisation and information systems;
- Develop the skills in communication, verbal and written, which play an important part in business computing and information processing;

COURSE NAME: Computer Programming using C

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Write, compile and debug programs in C language.
- Use different data types, operators and console I/O function in a computer program.
- Design programs involving decision control statements, loop control statements and case control structures.
- Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
- Comprehend the concepts of structures and classes: declaration, initialization and implementation.
- Apply basics of object oriented programming, polymorphism and inheritance.
- Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.

COURSE NAME: Computer Organization and Architecture

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Understand the basics of computer hardware and how software interacts with computer hardware
- Analyze and evaluate computer performance
- Understand how computers represent and manipulate data
- Understand computer arithmetic and convert between different number systems
- Assemble a simple computer with hardware design including data format, instruction format, instruction set, addressing modes, bus structure, input/output, memory, Arithmetic/Logic unit, control unit, and data, instruction and address flow
- Use Boolean algebra as related to designing computer logic, through simple combinational and sequential logic circuits

COURSE NAME: Mathematical Foundation of Computer Science

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- Be familiar with the basic terminology of functions, relations, sets and demonstrate knowledge of their associated operations.
- Be able to solve advanced mathematical problems, apply various methods of mathematical proof, and communicate solutions in writing
- Become capable to comprehend advanced mathematics, and present the material orally and in writing
- Utilize the knowledge of computing and mathematics appropriate to the discipline.
- Evaluate mathematical principles and logic design

COURSE NAME: Operating Systems

CLASS –M. Sc (IT) SEMESTER – I

Course Outcomes

After successful completion of the course students will be able to

- 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.
- Learn the mechanisms involved in memory management in contemporary OS.
- Gain knowledge on distributed operating system concepts that includes architecture, deadlock detection algorithms and agreement protocols.
- Understand different approaches to memory management.
- Understand the structure and organization of the file system

Semester-2

COURSE NAME: Object Oriented Programming Using C++

CLASS –M. Sc (IT) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Write, compile and debug programs in C++language.
- Use different data types, operators and console I/O function in a computer program.
- Design programs involving decision control statements, loop control statements and case control structures.
- Understand the implementation of arrays, pointers and functions and apply the dynamics of memory by the use of pointers.
- Comprehend the concepts of structures and classes: declaration, initialization and implementation.
- Apply basics of object oriented programming, polymorphism and inheritance.
- Use the file operations, character I/O, string I/O, file pointers, pre-processor directives and create/update basic data files.

COURSE NAME: Data and File Strucures

CLASS - M. Sc (IT) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

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

COURSE NAME: Visual Basic

CLASS –M. Sc (IT) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Design, create, build, and debug Visual Basic applications.
- Explore Visual Basic's Integrated Development Environment (IDE).
- Write and apply decision structures for determining different operations.
- Understand and identify the fundamental concepts of object-oriented programming.
- Perform tests, resolve defects and revise existing code.

COURSE NAME: RDBMS and Oracle

CLASS –M. Sc. (IT) SEMESTER – 2

Course Outcomes

After successful completion of the course students will be able to

- Gain the knowledge and understanding of Database analysis and design.
- Understand the use of Structured Query Language (SQL) and learn SQL syntax.
- Gain the knowledge of the processes of Database Development and Administration using SQL and PL/SQL.
- Understand the functional dependencies and design of the database
- Understand the concept of Transaction and Query processing

Semester-3

COURSE NAME: Web Technology

CLASS – M. Sc (IT) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- Understand, analyze and apply the role of languages like HTML, DHTML, CSS, XML, Javascript, VBScript, ASP, PHP and protocols in the workings of the web and web applications
- Analyze a web project and identify its elements and attributes in comparison to traditional projects.
- Create web pages using HTML, DHTML and Cascading Styles sheets.
- Analyze and build interactive web applications using ASP and ASP.NET.
- Build web applications using PHP, XML documents and XML Schema, and consume web services.

COURSE NAME: Java Programming

CLASS –M. Sc (IT) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- **Knowledge and Understanding:**
  - Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
  - Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- **Intellectual (Cognitive/ Analytical) Skills:**
  - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
  - Understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
  - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
  - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
  - Develop computer-based systems.

COURSE NAME: Software Engineering

CLASS –M. Sc (IT) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- Plan a software engineering process life cycle, including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements.
- Able to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project.
- Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.
- Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice.
- Able to use modern engineering tools necessary for software project management, time management and software reuse.

COURSE NAME: Computer Networks

CLASS –M. Sc (IT) SEMESTER – 3

Course Outcomes

After studying this course, students should be able to:

- Understand basic computer network technology.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Describe data link protocols, multi-channel access protocols and IEEE 802 standards for LAN.
- Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme.
- Discuss the elements and protocols of transport layer

Semester4

COURSE NAME: Computer Graphics

CLASS –M. Sc (IT) SEMESTER – 4

- Demonstrate an understanding of contemporary graphics hardware.
- Create interactive graphics applications in C++ using one or more graphics application programming interfaces.
- Functions to implement graphics primitives.
- Demonstrate geometrical transformations.
- Demonstrate an understanding of the use of object hierarchy in graphics applications.

Course Outcomes

After studying this course, students should be able to:

COURSE NAME: Linux Administration

CLASS –M. Sc (IT) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Understand the basic set of commands and editors in Linux operating system.
- Perform shell programming in Linux operating system
- Demonstrate the role and responsibilities of a Linux system administrator.
- Distinguish various filter and server commands

COURSE NAME: Modern Information Systems

CLASS –M. Sc (IT) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Relate the basic concepts and technologies used in the field of management information systems;
- Compare the processes of developing and implementing information systems.
- Outline the role of the ethical, social, and security issues of information systems.
- Translate the role of information systems in organizations, the strategic management processes, with the implications for the management.
- Apply the understanding of how various information systems like DBMS work together to accomplish the information objectives of an organization.

COURSE NAME: Artificial Intelligence

CLASS –M. Sc (IT) SEMESTER – 4

Course Outcomes

After studying this course, students should be able to:

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.
- Demonstrate proficiency in applying scientific method to models of machine learning.
- Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

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District Mansa, Punjab-151502

MCA

Programme Outcomes

The program focuses on the skill enhancement of students in Computer Application in which following skills are enhanced:

- Apply the knowledge of mathematics and computing fundamentals to various real life situations for any given environment.
- Design and develop applications to analyze and solve all computer science related problems.
- Design applications for any desired needs with appropriate considerations for any specific need on societal and environmental aspects.
- Analyze and review literatures to invoke the research skills to design, interpret and make inferences from the resulting data.
- Integrate and apply efficiently the contemporary IT tools to all computer applications.
- Solve and work with a professional context pertaining to ethics, social, cultural and cyber regulations
- Involve in perennial learning for a continuous career development and progress as a computer professional
- Function effectively both as a team leader and team member on multi disciplinary projects to demonstrate computing and management skills
- Communicate effectively and present technical information in oral and written reports
- Utilize the computing knowledge efficiently in projects with concern for societal, environmental, and cultural aspects
- Function competently as an individual and as a leader in multidisciplinary projects
- Create and design innovative methodologies to solve complex problems for the betterment of the society
- Apply the inherent skills with absolute focus to function as an successful entrepreneur

This program fit the students for following job role:-

- Software Developer
- Hardware Engineer
- Database Engineer
- Cloud Architect
- Data Scientist
- Web Developer
- Network Engineer

COURSE OUTCOMES

SEMESTER – 3

COURSE NAME: Design and Analysis of Algorithms

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Argue the correctness of algorithms using inductive proofs and invariants.
- Analyze worst-case running times of algorithms using asymptotic analysis.
- Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
- Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic-programming algorithms, and analyze them.
- Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.
- Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, and synthesize new graph algorithms.

COURSE NAME: Software Engineering

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Acquire strong fundamental knowledge in science, mathematics, fundamentals of computer science, software engineering and multidisciplinary engineering to begin in practice as a software engineer.
- Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.
- Deliver quality software products by possessing the leadership skills as an individual or contributing to the team development and demonstrating effective and modern working strategies by applying both communication and negotiation management skill.
- Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development.

COURSE NAME: Decision Support Systems

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- describe the decision-making process, the concepts and principles of a decision support system.
- identify decision support tools that can aid decision making.
- apply system development methodology to develop a decision support system.
- develop a functional prototype of a decision support system for a given case.

COURSE NAME: Programming in Java

CLASS - MCA SEMESTER – 3

Course Outcomes

- **Knowledge and Understanding:**
  - Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
  - Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- **Intellectual (Cognitive/ Analytical) Skills:**
  - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
  - Understand and use of different exception handling mechanisms and concept ofmultithreading for robust faster and efficient application development.
- **Practical Skills:**
  - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
  - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
  - Develop computer-based systems.

COURSE NAME: Organisation Behaviour and Development

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization.
- Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization.
- Analyze the complexities associated with management of the group behavior in the organization. Demonstrate how the organizational behavior can integrate in understanding the motivation (why) behind behavior of people in the organization.

COURSE NAME: System Software

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Understand the functions, features and design options of macro processors.
- Understand the functions and design options of loader, editor structure and functions and capabilities of an interactive debugging system.
- Analyze the working of Lexical analyzer (LEX) and Parser tool (YACC)
- Understand the proficiency in software development cost estimation, testing methodologies and author a software testing plan.

COURSE NAME: Computer based Optimization Techniques

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Relate key concepts and applications of various optimization techniques
- Identify the appropriate optimization technique for the given problem
- Formulate appropriate objective functions and constraints to solve real life optimization problems.

COURSE NAME: Data Mining and Data Warehousing

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Understand warehousing architectures and tools for systematically organizing large database and use their data to make strategic decisions.
- Understand KDD process for finding interesting pattern from warehouse.
- Remove redundancy and incomplete data from the dataset using data preprocessing methods.
- Characterize the kinds of patterns that can be discovered by association rule mining.
- Discover interesting patterns from large amounts of data to analyze for predictions and classification.
- Develop a data mining application for data analysis using various tools.

COURSE NAME: ERP Systems and Processes

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Make basic use of Enterprise software, and its role in integrating business functions
- Analyze the strategic options for ERP identification and adoption.
- Design the ERP implementation strategies.
- Create reengineered business processes for successful ERP implementation.

SEMESTER – 4

COURSE NAME: Operating Systems

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Describe the important computer system resources and the role of operating system in their management policies and algorithms.
- Understand the process management policies and scheduling of processes by CPU
- Evaluate the requirement for process synchronization and coordination handled by operating system
- Describe and analyze the memory management and its allocation policies.
- Identify use and evaluate the storage management policies with respect to different storage management technologies.
- Identify the need to create the special purpose operating system

COURSE NAME: Data Communication and Computer Networks

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand basic computer network technology.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Describe data link protocols, multi-channel access protocols and IEEE 802 standards for LAN.
- Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme.
- Discuss the elements and protocols of transport layer

COURSE NAME: Web Programming using ASP.Net

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- To develop WebPages, Static Websites, Dynamic Websites.
- To use ASP as Server Side Scripting Language.
- To use PHP as Server Side Scripting Language.
- To use JSP, JavaScript.
- To understand database and it's connectivity with Server Side Scripting language.
- To develop Web Applications with MySQL/SQL as backend.

COURSE NAME: Business Intelligence

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Describe the concepts and components of Business Intelligence (BI).
- Critically evaluate use of BI for supporting decision making in an organisation.
- Understand and use the technologies and tools that make up BI (e.g. Data warehousing, Data reporting and use of Online Analytical Processing (OLAP)).
- Understand and design the technological architecture that underpins BI systems.
- Plan the implementation of a BI system.

COURSE NAME: Object Oriented Modeling and design using UML

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Model the software development life cycle
- Understand the UML notation and symbols
- Implement the object-oriented approach to analyzing and designing systems and software solutions
- employ the UML notation to create effective and efficient system designs

COURSE NAME: Embedded Systems

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand the concept of embedded system, microcontroller, different components of microcontroller and their interactions.
- Get familiarized with programming environment to develop embedded solutions.
- Program ARM microcontroller to perform various tasks.
- Understand the key concepts of embedded systems such as I/O, timers, interrupts and interaction with peripheral devices.

COURSE NAME: Compiler Design

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand fundamentals of compiler and identify the relationships among different phases of the compiler.
- Understand the application of finite state machines, recursive descent, production rules, parsing, and language semantics.
- Analyze & implement required module, which may include front-end, back-end, and a small set of middle-end optimizations.
- Use modern tools and technologies for designing new compiler.

COURSE NAME: Software Testing and Quality Assurance

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Describe software engineering testing process
- Describe the quality assurance process and its role in software development.
- Demonstrate variety of testing techniques, methods, and tools.

- Describe the state of the practice verification and validation techniques.
- Demonstrate proficiency in managing a software project to customer requirements.

COURSE NAME: Graph Theory

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Apply theories and concepts to test and validate intuition and independent mathematical thinking in problem solving.
- Integrate core theoretical knowledge of graph theory to solve problems.
- Reason from definitions to construct mathematical proofs
- Evaluate and synthesize published research papers.
- Analyze new networks using the main concepts of graph theory.

SEMESTER – 5

COURSE NAME: Artificial Intelligence

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.
- Demonstrate proficiency in applying scientific method to models of machine learning.
- Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

COURSE NAME: Computer Graphics

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate an understanding of contemporary graphics hardware.
- Create interactive graphics applications in C++ using one or more graphics application programming interfaces.
- Functions to implement graphics primitives.
- Demonstrate geometrical transformations.
- Demonstrate an understanding of the use of object hierarchy in graphics applications.

COURSE NAME: Theory of Computation

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- design Finite Automata machines for given problems;
- analyze a given Finite Automata machine and find out its Language;
- design Pushdown Automata machine for given CF language(s);
- generate the strings/sentences of a given context-free languages using its grammar;
- design Turing machines for given any computational problem

COURSE NAME: E-Commerce

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Analyze the impact of E-commerce on business models and strategy.
- Describe the major types of E-commerce.
- Explain the process that should be followed in building an E-commerce presence.
- Identify the key security threats in the E-commerce environment.
- Describe how procurement and supply chains relate to B2B E-commerce.

COURSE NAME: Software Project Management

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Identify the different project contexts and suggest an appropriate management strategy.
- Practice the role of professional ethics in successful software development.
- Identify and describe the key phases of project management.
- Determine an appropriate project management approach through an evaluation of the business context and scope of the project.

COURSE NAME: Cloud Computing

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Understand the concepts, characteristics, delivery models and benefits of cloud computing
- Understand the key security and compliance challenges of cloud computing
- Understand the key technical and organisational challenges
- Understand the different characteristics of public, private and hybrid cloud deployment models.

COURSE NAME: Network Security

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Identify some of the factors driving the need for network security
- Identify and classify particular examples of attacks
- Define the terms vulnerability, threat and attack
- Identify physical points of vulnerability in simple networks
- Compare and contrast symmetric and asymmetric encryption systems along with their vulnerability to attack, and explain the characteristics of hybrid systems.

COURSE NAME: Ethical Hacking

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Plan a vulnerability assessment and penetration test for a network.
- Execute a penetration test using standard hacking tools in an ethical manner.

- Report on the strengths and vulnerabilities of the tested network.
- Identify legal and ethical issues related to vulnerability and penetration testing.

COURSE NAME: Data Science & Machine Learning

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Develop relevant programming abilities.
- Demonstrate proficiency with statistical analysis of data.
- Develop the ability to build and assess data-based models.
- Execute statistical analyses with professional statistical software.
- Demonstrate skill in data management.

Semester-6

Project Dissertation (Industrial Training and Project in Software/IT industry

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GURU NANAK COLLEGE BUDHLADA, District Mansa, Punjab-151502

Department of Agriculture and Food Processing

B. Sc. (Agriculture) Hons.
Programme Outcomes

- To able to demonstrate critical thinking and problem solving skills as they apply to a variety of animal and or plant production systems.
- To provide the sound knowledge in the Agriculture and allied science subjects required to solve common problems in management of crop cultivation, improvement, livestock rearing and their marketing.
- To develop a good teaching-learning environment for higher studies and help in selection of professional careers in government and private organization, agro- based industries, educational/ research/extension, institutes etc.
- To develop the skills for leadership, ethical integrity, and professional engagement in agriculture and allied science.
- To provide adequate information about natural and other resources through a course curriculum for the betterment of life.
- To produce highly skilled professionals in field of various branches of agriculture tomeet the need of various scientific agriculture institutions as well as farmers demand for agriculture professionals.
- To demonstrate research based knowledge of the legal and ethical environment impacting agriculture organizations and exhibit an understanding and appreciation of the ethical implications of decisions.
- To understand how all aspects of agriculture combine and are used by scientists, marketers, producers and understand how employer characteristics and decision-making at various levels enhance the success of an agricultural enterprise.

After completing the course the students will be able to:

- To provide highly skilled training in seed production and process, post harvest handling and value addition of horticultural crops, integrated agriculture management, livestock and agricultural mechanization, protected cultivation, mushroom training and composting.
- To develop skill through extension activities that help students to get aware of agricultural field issues of farmers and develop understanding about agriculture by learning practices.
- Understand the basic knowledge of agriculture and related subjects in the current scenario of Indian and world Agriculture.
- Develop an understanding of communication methods, resources utilization, cultivation of crops, management of crops, and value addition of agricultural produces.

- Develop the skills to manage agricultural farms, enhance quality of farm- produces and their commercial utilization.
- Demonstrate the methods used in collection, presentation of data and analysis of results of experiments in laboratories and fields and their validation.
- Understand all related methods in agriculture to increase the profit from crop fields and livestock.
- Learn to make optimum decision at various levels that enhances the success as an agricultural enterprise.
- Extension activities in agriculture and allied sectors around the local villages through Rural Agricultural Work Experience and Agro-industrial Attachment (RAWE & AIA).
- Harmonize the relation with Agriculture Research Institutions, State Agriculture Universities, Krishi Vigyan Kendra (KVK), etc.
- Motivate for entrepreneurship, start-up through project planning and execution, research and training during field visits etc.
- To demonstrate and understanding of the appreciation for the importance of the impact of globalization and diversity in agriculture.

Course Outcomes of B.Sc. (Hons.) Agriculture

Semester-I		
Subject Code	**Subject title**	**Subject Outcome**
AGRB 1101C	Fundamental of horticulture	• Educate about the concepts of horticulture; importance and scope, botanical classification of horticultural crops; climate and soil, and propagation methods of different horticultural crops etc. • Describe the various principles and methods of training and pruning, kitchen gardening, basic principles of orchard establishment, unfruitfulness etc. • By the end of this course students will be able to critically evaluate the information related to horticulture as being scientifically based or opinion based and contribute to the knowledge based information. • Analyze the various problems with horticulture crop Production
AGRB 1103C	Fundamental of soil science	• Familiarize the students with different concepts of soil, classification and soil of India. • Understand the soil organism, organic matter and soil pollution. • Develop the skills of soil sampling techniques and sampling tools. • Students learn about physical and chemical properties of soil and their effect on plant's health. • To aware the students about causes, effects and remedies to prevention and mitigation of soil pollution. • To knowledge about soil forming rocks and minerals, their weathering and soil forming processes and climatic factors affect them.
AGRB 1106C	Fundamental of Agronomy	• Discuss about the agronomy, fertilizer, organic manures, agricultural tools, horticultural crops; use of iron and

		steel in agriculture. • Identify the different agricultural tools, fertilizers, seeds, and weeds. • Operate the agricultural tools in the field. • Differentiate the fertilizers, manure & bio-fertilizers.
AGRB 1104C	Introduction to Forestry	• Educate about the importance of trees in agriculture, forest regeneration, forest mensuration, agro-forest; factors affecting standing trees in forest and plantations; salient features of Indian Forest Policies, forest management, forest resources and produce, forest cover in India and in different states, social life and environmental issues, etc. • Develop the understanding of methods used in forest regeneration, land recreation, nursery and forest management, silvicultural practices, collecting of non-timber forest products, etc. • Develop the skills in nursery preparation of forest trees, tending operations, forest mensuration, selection of trees in agro-forestry, etc. • Develop the ability to measure plant and tree growth, volume of felled and standing trees, age of trees, natural and artificial regeneration, basal cover of forests, etc.
AGRB 1102C	Biochemistry & Bio Tech.	• Educate the outlines of bio-molecules, metabolic pathways, morphology and anatomy of living cells. • Develop the understanding of energy synthesis, hereditary mechanisms, enzymatic reactions, cellular function and growth, molecular tests, etc. • Develop the skills for applying principles and methods biochemistry and biotechnology to understand plant growth and metabolisms. • Develop the ability to apply advance techniques for standardization of biochemical processes in plants,

		optimize cell and tissue growth and culture plant cell and tissue in the laboratory.
AGRB 1110T	Agriculture Heritage	• Understand the relevance of heritage in agriculture. • Understand the scope of agriculture in future. • Develop the skills on philosophical and technical difference between historical and scientific agriculture • Develop an evaluative thinking on the facts and information about agricultural history
AGRB 1107T	Rural Sociology Education Psychology	• After completing of the course the students will be able to acquaint the knowledge on various aspects related to rural society, nature and structure of Indian rural society, social stratification, social institution, cultural concept, meaning and significance of agricultural extension and social groups. • Develop understanding on the significance of culture for the society, connotation of personality in the corporate/professional world, learning attitude and self-motivation. • Develop the personality of the students for the professional world, self-assessment, learn rectification and improvement. • Develop the evaluative thinking on need of soft skills (self- motivation, learning attitude, positive attitude, aspiring thoughts) while improvising oneself. Analyzing attitude on rural society, nature and structure of rural society and components of rural society. • Analyze the salient features of Personality and Learning. • Evaluate intelligence, motivation, various theories of motivation
AGRB 1108C	Introductory Biology	• Educate the basics terms describe life and its basic characteristics, taxonomy, evolution, eugenics, etc. • Develop the understanding of plant morphology, vital metabolisms of the cell, system of organizations,

		reproduction and seed germination, role of forest trees and animals in agriculture, etc. • Develop the skills in mounting samples of plant and animal cell/tissue microscopy, identification and classification of plants and animals, categorization of inflorescence, flower and fruits, etc. • Develop ability to differentiate characters of Brassicaceae, Fabaceae, Poaceae and other families of plants. •
Semester -II		
AGRB 1201C	Fundamental of Genetics	• explain with concepts, scope, and importance of genetics in the field of agriculture • Develop the understanding of Mendelian principles and their significance in heredity and inheritance of Qualitative & Quantitative traits • To interpret the process and purpose of cell division, linkage, crossing over, gene interaction, sex determination, and blood group genetics • To analyze the possible genotypes that could occur in an offspring, according to the genotype of the two parents with help of Probability and Chi-square test.
AGRB 1202C	Agriculture Microbiology	• explain with basic terms of microorganisms, prokaryotic and eukaryotic microbes, microbial growth, pure culture, microbial association, soil fertility, symbiotic, associative and asymbiotic of microbes, bio-fertilizers, bio- pesticides, bio-degradation, etc. • Develop the understanding of the role of microbes in soil fertility, crop production and human welfare. • Develop the skills in utilization of various

		methods, equipment, laboratory tools, glassware, etc. for isolation, identification, preservation, classification and utilization of useful microbes. • Develop the ability to differentiate useful, virulent and non-useful microbes.
AGRB 1203C	Soil & Water Cons. Engg.	• Learn the soil and water conservation techniques and provide knowledge about soil erosion, their causes and agents. • Develop the knowledge about water erosion, Gully classification, their control and soil loss measurement techniques. • Develop the knowledge and understanding of the mechanical measure for controlling soil and water erosion. • Develop the skills about water harvesting, their techniques, wind erosion and their control. • Student learn about soil and moisture conservation techniques and reclamation of degraded agricultural land.
AGRB 1204C	Crop Physiology	• Develop an ability to identify C3, C4 and CAM plants, analyze the physical and chemical factors regulate plant growth, evaluate visual symptoms of nutrients deficiency in plants, etc. • Develop the understanding of mechanisms of various metabolic processes in plants - Photosynthesis, respiration, fat metabolism, plant growth, nutrient absorption, etc.
AGRB 1205T	Agri. Economics	• Identify elements of business success in agriculture and food-processing as well as elements that determine economic role of agriculture in national economy. • Propose methods of micro- and macroeconomic decision making in agriculture in different agro-

		ecological and agro-economic circumstances.
AGRB 1206C	Fundamental of Plant Pathology	• Student will acquaint about concepts of plant pathogens, major disease causing organisms and their etiology. • To provide specific knowledge about host pathogen interactions. Recognition of plant disease is the first step in doing something about them. • To give specific knowledge about environment and disease development.
AGRB 1207C	Fundamental of Entomology	• To be able to identify morphological characteristics, feeding habit and habitat of agriculturally important insect-pest. • To be able to apply concepts and analytical approaches in evolutionary biology, genetics and other areas of insect biology of the student's choice.
AGRB 1208C	Fundamental of Agricultural Ext. Education	• Skilled about concept and principle of Extension education their application at village, the, and district level
Semester-III		
AGRON 201	Crop Production Tech-I Kharif Crops	• Students are skilled about concept and principles of Crop Production Technology. • Students will be able to know about origin, geographical distribution, and economic importance, soil and climatic requirements, varieties, cultural practices and yield of Rabi crops.
GPB 201	Fundamental of Plant Breeding	• List out various contribution, the significance of plant breeding and its milestone in the field of agriculture • Develop the understanding about modes of selection, the evolution of crops, conservation of

		genetic resources, population genetics and significance of IPR in crop improvement • plan the breeding objectives and implementation of different selection methods and hybridization techniques for various field crop • Distinguish the breeding method for self, cross and asexually propagated crops. • Students skilled about concept and principle of breeding and their application to develop variety. Identify sources of genetic variation to conduct breeding programme. • To identify characteristics of self and cross pollinated plants. Appreciate the issues associated with breeding plants in commercial setting. • To understand the application of conventional breeding and gene technology approaches in breeding programmes.
ECO 201	Agricultural Finance & cooperation	• Explain the broad feature of Indian financial institutions with instruments to control credit in the country. • To apply economics principles to understand the conduct and performance of the agricultural industry.
AGRI-ENG 201	Farm Machinery & Power	• Students Skilled about concept and principle of Mechanization and their application to develop new technology for smooth completion of agri field work.
HORT 201	Production Tech. for Vegetable & spices	• Students skilled practical knowledge on production techniques of vegetables and spices, Importance in human nutrition and national economy, quality requirement and managing skill for solving field problems.
LPM 201	Livestock Poultry	• Students learn about to develop and evaluate

	Mngt.	animal production and management systems by integrating knowledge of animal genetics, nutrition, reproduction, and other relevant disciplines and applying scientific and quantitative reasoning to challenges.
EVS 201	Environmental studies and disaster management	• Learn about the concepts of natural resources, Food resources, mineral resources, Concept of non Conventional energy resources, types and various applications of renewable resources and current potentials of energy resources. Ecosystem Links between environmental components and their role and types of ecosystems.
Semester-IV		
AGRON 202	Crop Production Tech-I Rabi Crops	• Students are skilled about concept and principles of Crop Production Technology. Students will be able to know about origin, geographical distribution, and economic importance, soil and climatic requirements, varieties, cultural practices and yield of Rabi crops.
HORT 202	Production tech. ornamental crop and LS	• Students Skilled about to set up business related to ornamental crops and landscaping, to develop effective ideas related to collecting, processing and marketing of ornamental and flower crops and their cultivation practices.
SOIL 201	Problematic soils and their mangt.	• To provide knowledge about waste land and problematic soils in India and management of the soils. Knowledge of different reclamation and management practices for the development of the soils. To Understand different factors responsible for saline, sodic and acidic soils and their properties.
HORT 203	Prod. Tech of fruit and Plantation crop	• Students are able to know importance of different fruit crops and plantation. Students will understand package of practices for the major

		crops like mango, banana, guava, lemon, pineapple, rubber, tea etc. To understanding the concept of high density planting in different fruit crops.
GPB 203	Principles of Seed tech.	• explain with scope and importance of seed technology in agriculture and the role of officials and legislation, seed act and seed order in quality seed production • Develop an understanding of various seed production techniques for different field crops, the importance of maintenance of purity of crop varieties, and factors causing deterioration of variety. • Execution of various phases of seed certification, field inspection, and seed purity testing • Analyze the factors related to genetic and physical purity of seed and its health status of seeds of a variety during seed processing.
AGRON 203	Farming system and sustainable agriculture	• The students will be able to explain the major aspects of agricultural practices and traditions, the relationships among culture, economics, politics, science, and agricultural development and to minimize agricultural pollution and sustain food production.
ECO 202	Agri- Marketing trade & prices	• Students Skilled about concept and principle farm planning budgeting and marketing
AGROMET 201	Introductory Agro-meteorology and climate change	• To understand roles of agrometeorology in agriculture and its relation to other areas of agriculture to acquaint with recent developments in agrometeorology with historical development of climate change. • Agrometeorology or Agricultural meteorology studies meteorological and hydrological factors in

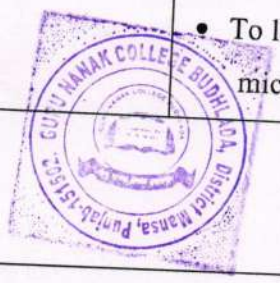
		relation to agriculture.
Semester –V		
PATH 301	Diseases of horticultural crops and their management	• Students Skilled about concept and principle of Diseases of horticultural crops and their Management
HORT 301	Production tech. ornamental crop and LS	• Students Skilled about concept and principle of Production tech. ornamental crop and LS and economical importance
FSM 301	Principles of food science and PHT	• Student will learn food nutrient concept and post harvest handling of fruit and crops and food safety
EXT 301	Fundamentals of agricultural extension	• Students Skilled about concept and principle of extension education activity community development programme
GPB 301	Crop improvement	• Remember the evolutionary history of important field crops along with their centre of origin, its wild species and wild relatives that can be utilized in crop improvement • Develop the understanding of germplasm conservation, utilization, and genetics of qualitative and quantitative characters, and their inheritance. • Analyze breeding procedures and methods breeding objectives in different crop important for the development of improved varieties
BIOT 301	Introduction to biotechnology	• Students Skilled about concept and bio technique and tissue culture, media preparation
Semester-VI		
PATH 302	Integrated pest and disease management	• Student will know the common pests and pathogens of different diseases. • Student acquire the knowledge about etiology, and symptoms of these diseases which helps in diagnosis of the diseases of field and horticultural crops By knowing means of dispersal of these

		diseases suitable management methods can be applied. • Eco-friendly and economically suitable management practices may be adopted.
HORT 302	Post harvest management of horticultural crops and value addition	• Students understand the post harvest technology and value addition of horticultural crops, work space, tool and equipment design for PHT and value addition. • To study the various certification and accreditation i.e. FPO, ISO and other leveling.
FOOD 301	Dairy technology	• Students learn about milk processing and milk products. • About milk adulteration and quality improvement. • Packaging and marketing of milk products.
AGRON 301	Principles of organic farming	• Students learn about production techniques of organic farming and certification procedure. • To identify the health, environment and economic benefits of organic farming
COMP 301	Computer applications in agriculture	• Learn about the use of Decision support systems, Agriculture Expert System and Soil InformationSystems in Agriculture.
SOIL 301	Analytical techniques in soil, plant, fertilizers and water	• To determine the level of availability of nutrients in soil, plant and water. • To predict the increase in yield and profitability of fertilization
HORT 301	Production technology of spices, plantation, medicinal and aromatic plants	• Students learn about the use of medicinal and aromatic herbs sustainably. To set up business related to medicinal, aromatic and landscaping. To develop effective ideas related to cultivation practices, processing and marketing herbal natural sources.
Semester-VII		
PATH-401	Mushroom cultivation	• Students learn about the various cultivation

		techniques and practices for mushroom cultivation. They are able to plan and manage mushroom farming at commercial level.
ENTO 401	Apiculture, sericulture, pisciculture and lac culture	• Students can adopt apiculture, sericulture and lac culture as an entrepreneur according to agro climatic zone. To understand commercial methods of rearing, equipment, seasonal management, insect pest and disease and important species for commercial use of honey bee, silkworm and lac insect. Identification of different bio control agents (Predator, Parasite and Parasitoids) and their use for sustainable pest management.
ABM 401	Agri-business Management	• Students learn about the analysis of business environment in order to identify business opportunities, Specify the basic performance indicators of entrepreneurial activity.
AGRON 401	Principles and practices of weed management	• Students learn about why to undertake environmental weed control, different approaches of weed management, harmful and beneficial effects of weeds in Agriculture. Students will be acquainted planning for weed management and weed management processes.
AGRON 402	Farming system and sustainable agriculture	• The students will be able to explain the major aspects of agricultural practices and traditions, the relationships among culture, economics, politics, science, and agricultural development and to minimize agricultural pollution and sustain food production.
AGRON 403	Rainfed farming and watershed management	• Study about rain water use for a larger area by suitable watershed management techniques. Conservation of soil by adopting latest soil conservation techniques will help in obtaining higher production of Rainfed crops.

AGRON 404	Modern concepts in crop production	• Students learn about the concept of "doing the right thing in the right place at the right time" has a strong intuitive appeal which gives farmers the ability to use all operations and crop inputs more effectively. More effective use of inputs results in greater crop yield and/or quality, without polluting the environment.
AGRON 405	Principles and practices of water management	• To learn about water resources in India. • To learn about methods and criteria of irrigation in different crops. • To learn about measurement and quality of irrigation water.
HORT 401	Nursery management of horticultural crops	• To supply elite planting material of highest possible quality for establishment of new orchards. • Learn about propagation methods in nurseries.
HORT 402	Commercial fruit production	• To know importance of different fruit crops. Students will understand canopy architecture for higher productivity in mango and grapes. Students will understand package of practices for the major crops like mango, banana, guava, lemon, pineapple etc. To understanding the concept of high density planting in different fruit crops
HORT 403	Commercial vegetable production	• Students skilled practical knowledge on production techniques of vegetables and spices, Importance in human nutrition and national economy, quality requirement and managing skill for solving field problems.
HORT 404	Commercial floriculture and landscape architecture	• Students Skilled about to set up business related to ornamental crops and landscaping, to develop effective ideas related to collecting, processing and marketing of ornamental and flower crops and their cultivation practices.

HORT 405	Seed production of horticultural crops	• Learn about supply the disease free seed in the market to get the environment friendly cultivation of horticultural crops. To increase the farm income by producing high yielding disease free quality seed and decrease the cost of cultivation also. Production of hybrid seed of different crops to increase the farm income.
Semester-VIII		
EXT 401	Extension methodologies and communication skills for technology transfer	• Learn about education, Extension Programme planning Meaning, Process, Principles and Steps in Programme Development. Extension systems in India: Extension efforts in Pre-independence era. New trends in agriculture extension: privatization extension. Monitoring and evaluation – concept and definition, monitoring, and evaluation of Extension programmes, Transfer of Technology-Concept and models.
AGRON 406	Fertilizer use in crop production	• To understand essentiality of plant nutrients and mechanism of nutrient transport to plant and factor affecting nutrient availability. • To be able about procedure of soil testing and establish soil testing laboratory in future as a entrepreneur.
AGRON 407	Cropping system	• To learn about different types of cropping systems according to climatic conditions. • To learn about efficient use of all available resources to obtain higher net returns.
AGRON 408	Water management and micro irrigation	• To learn about methods and criteria of irrigation in different crops. • To learn about measurement and quality of irrigation water. • To learn about the installation and management of micro irrigation methods



HORT 406	Post harvest management of horticultural crops	• Students understand the post harvest technology and value addition of horticultural crops. • To learn about work space, tool and equipment design for PHT and value addition. • study the various certification and accreditation i.e. FPO, ISO and other leveling
HORT 407	Tissue culture and micro propagation techniques in horticulture	• Application of plant tissue culture in crop improvement • Tackled the problems in convention breeding. • Plant tissue culture is a area of entrepreneurship.
HORT 408	Breeding of horticultural crops	• Update knowledge on the recent research trends in the field of breeding of fruit crops with special emphasis on tropical, subtropical and temperate crops grown in India. • Evolutionary mechanisms adaptation and domestication, Genetic resource, cytogenetics, cytomorphology, chemotaxonomy, genetics of important traits and their inheritance pattern, variation and natural selection, spontaneous mutations, incompatibility systems in fruits, recent advances in crop improvement efforts-introduction and selection chimeras, apomixes, clonal selection, intergeneric, interspecific and intervarietal hybridization, mutation and polyploidy breeding, resistance breeding to biotic and abiotic stresses, breeding for improving quality, molecular and transgenic approaches in improvement of selected fruit crops.

GURU NANAK COLLEGE BUDHLADA, Distt. Mansa, Punjab-151502

Head
Department of Agriculture
GURU NANAK COLLEGE
Budhlada (Mansa)

B.Voc. Food Processing
Program Outcome

- Hand on training to students for skill development and encourage them for becoming entrepreneur infood processing sector which provide a support base for the country's food security.

- To give quality education and training to meet growing demand of food processing industries in addition to pioneering the development of innovative technologies for conservation and process of raw food with value addition.

- To acquire knowledge of emerging /alternative food processing technologies and enable a studeto know the relative advantages/disadvantages over existing technologies.

Course Outcomes

	Subject (semester 1)	Course outcome
1.	**Introduction to computers**	1. Gain knowledge on historical developments and computer peripherals in the operation of computers. 2. Acquire the skills in exploring windows applications in development of documents, data analysis in spread sheet and power point presentation 3. Understand the computer networks in efficient utilization of internet and intranet connection in digital communication. 4. Elicit multimedia presentation focusing on utilization of authorizing tools. 5. Able to apply computer applications in meal management practices and explore the nutritional software and e-journals in professional and academic endeavour.

2	**Documentation in food processing**	1. Students will gain the information about programs needed to inspect raw materials in different food industries. 2. Learners will come to know about applications of computer in different food industries. 3. Students will learn and practice implementation, life cycle and applications of Enterprise resource planning (ERP). 4. Learners will have information about primary, secondary and tertiary packaging. 5. Students will perform analysis of data using statistical packages. 6. Learners will practice various software used in food industry.
3	**Basics of food processing**	1. Comprehend the nature and properties of foods 2. Understand the principles of the various Food Processing Methods 3. Classify the various Foods based on their Structure 4. Understand the processing methods of different foods 5. Differentiate between Processing of different Food Groups
4	**Dairy Processing**	1. Understand the processes related to storage, processing and distribution of milk and milk Products. 2. Perceive the different properties of milk and milk products. 3. Apprehend the thermal processing of milk. 4. Grasp the technology of fat rich dairy products. 5. Comprehend the technology of condensed milk, dried milk, cheese, yoghurt and indigenous products will be understood. 6. Have knowledge regarding hygiene and sanitation practices in the milk and milk products industry.

	Semester 2	
1	**Introductory Food Microbiology**	1. Acquire the knowledge on the basic concepts of microbes in food and human welfare. 2. Relate the theoretical knowledge with microbes in environment. 3. Comprehend the knowledge gained on the characteristics of the microorganism in food and apply the techniques to control microbes. 4. Understand the relevance of microbial spoilage of various foods and its intoxications 5. Provide frame work on the concepts of Quality Control Activities
2	**Basics of food packaging**	1. Understand the concepts of packaging in terms of history, principle and functions 2. Identify the various packaging materials available in the market 3. Gain knowledge on the packaging methods and systems 4. Enumerate the packaging of different food products 5. Ascertain the safety of packages through storage, handling and distribution
3	**Holistic Development** **I :Personality Development**	1. Understand the basics of personality, Big five factors and role of Heredity and Environment on human personality 2. Determine the levels of personality through theories and assessing oneself and know the implications 3. Assess the determinants of personality and apply to life 4. Improve and groom one's own personality and to behave in a socially acceptable manner 5. Evaluate the causes of personality disorders and provide referral services
4	**Food products Packaging Technology**	1:Knowledge about packaging materials

		2: Understanding the types and manufacturing process. 3: Understand package testing methods 4: Identifying suitable package functions for given product
	Semester 3	
1	**Communication skills**	Communication skills are to convey your feelings, views, reasons, suggestions, arguments and information to the other person through your words, action and facial expressions. It also includes understanding the same when the other person expresses.
2	**Fundamentals of food and nutrition**	1. Acquire skill on various methods of assessing nutritional status. 2. Relate metabolism of macronutrients with health. 3. Comprehend the functions of micronutrients with health 4. Associate knowledge of nutrients with their deficiencies. 5. Apply the knowledge in determining the nutritional requirements.
3	**Introduction to Grain Milling and Machineries**	1. Comprehend the structure and composition of cereals. 2. Understand the processes for the preparation of various types of products from cereals. 3. Identify suitable equipments required for processing of cereals. 4. Comprehend the detailed manufacturing technologies of cereals consumed in daily life in food industries
4	**Fundamentals of Food Biochemistry**	1. Demonstrate proficiency in understanding physiochemical changes occurring in foods during cooking. 2. Explain the properties and reactions of the

		various food components. 3. Describe the basic principles and properties of starch proteins, fats and oils,pectic substances and spices and condiments. 4. Gain sufficient knowledge about chemistry of starch proteins, fats and oils, pectic substances.
5	**Introduction to Cereal and Legume Processing**	1. Comprehend the recent advancement in the major cereal grains quality and processing aspects. 2. Understand the mechanism underlying the interaction of various flour components and their role in end use quality. 3. Grasp the basic and advanced milling methods for wheat, rice, maize. 4. Know about by-product utilization of various grains.
6	**Environmental & Road Safety Awareness**	1. Knowledge on the importance of environment is elucidated 2. Understanding on the various principles and relationships between the plants and environment is unraveled. 3. Exposure to global issues like pollution and disasters to environment is given. 4. Awareness to the save greenery
	Semester 4	
1	**Food Spoilage and Control**	1Students will learn about various components of microscope and its principle. 2 Students will gain information about spoilage of food by various microorganisms. 3 Students will have knowledge about food adulteration. 4 Students will evaluate major causes of food spoilage such as various physical, chemical and microbiological.

		5 Students will develop knowledge about bacterialand non-bacterial food born diseases. 6 Learners will develop understanding about laboratory orientation and familiarization with various laboratory instruments.
2	**Quality Control and Regulations**	1. Recollect the food safety system and quality attributes. 2. Comprehend the knowledge gained on food laws and food safety regulations at regional and national levels. 3. Distinguish the role of national and international agencies in establishing food standards. 4. Execute Food laws and food safety standards in food service operations. 5. Monitor and evaluate food laws and standards in food service industry
3	**Fruits and vegetables processing**	1. Understand the structure and composition of fruits and vegetables and their role in nutrition. 2. Apprehend different operations like cleaning, grading, peeling concentration and different aroma recovery systems.etc involved in processing fruits and vegetables 3. Grasp the concept of quality in relation to fruit and vegetable based products. 4. Understand the processing and preservation techniques for fruits and vegetables to improve the shelf life.
4.	**Holistic Development II: Physical Training**	1Students will develop understanding about sports relationships and sports performance in India. 2 Students will gain knowledge about sports injuries and first aid, sports psychology and anxiety. 3 Learners will identify and evaluate rules and regulations of different games such as badminton, discuss throw and high jump.

		4 Learners will perform the measurement and preparation of the field. 5 Students will identify different requirements for game such as equipment's, materials and technique.
	Semester 5	
1	**Communication skills**	Communication skills are to convey your feelings, views, reasons, suggestions, arguments and information to the other person through your words, action and facial expressions. It also includes understanding the same when the other person expresses. Food processing industry depends on the dealing of dealer and consumer to develop the market of product.
2	**Entrepreneurship Development in Food Processing**	1. Understand the forms and practices adopted at business organizations 2. Gain knowledge on the various sources of finance and marketing procedures 3. Develop competencies in accounting procedures practiced at the organizations 4. Compile the financing and entrepreneurial tasks at the food based business 5. Encourage Entrepreneurship ventures in food product development and processing Sector
3	**Food industry Waste Management**	1Student will learn about classification & characterization of food industrial waste from dairy, fruit & vegetable processing etc. 2 Students will gain information about waste disposal method, economical aspects of waste treatment etc. 3 Students will evaluate different treatment methods for liquid waste etc. 4 Student will acquire knowledge about treatment methods for solid waste, biogas and effluent

		waste treatment method. 5 Learners will conduct experiments to determine BOD and COD of water sample. 6 Learners will conduct experiments to find the TDS and TSS. 7Students will prepare flow process chart of food plant waste utilization processes
4	**Marketing and Retail Management**	1.Apply the principles in product development and design 2.Understand the different steps involved in 3.Development of food products, testing and evaluation 4. Develop entrepreneurship skills in financial and marketing strategies
5	**Sugar Processing technology**	1Students will learn about the properties of sugarcane and sugar beet. 2 Students will gain information about different sugar production processes. 3 Students will develop understanding about the techniques and instruments involved in preparation of different confectionary products. 4 Students will prepare or manufacture different sugar products such as coffee, fudge, chewing gum etc. 5 Learners will conduct experiments to determine acidity, ash content, and moisture content of sugar products.
	SEMESTER 6 INDUSTRIAL INTERNSHIP	Students works as a trainee in food industry in quality or production unit under the supervision of experts and leans all about quality control and production unit in practical way

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Head
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Department of English

M.A. English

Program Outcomes

1. The students are expected to be familiarized with the history of English Language and literature along with conceptual understanding of various literary movements.
2. The students are expected to get acquainted with the major genres, ideas and trends of poetic and prose literature.
3. The students are expected to have developed phonetic and communication skills at the end of the course.
4. The students are expected to enhance awareness of structural, sociological, philosophical, psychological, comparative and historical perspectives of language and literature.
5. To students are expected to analyze, interpret, and understand the complex interrelationships between authors,texts, and specific social, political, and historical contexts and apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
6. The students are expected to gain perspective insights into the socio-political dynamics, the structuring points of view, the ideology, and the major aspects that mediate the writing, production, reception and survival of a literary work.
7. The students are expected to have enhanced literary, critical and aesthetic awareness of diverse cultures and literary works and thus to arrive at a broader vision of the world.
8. The four language skills known as LSRW are expected to be enhanced.
9. The overall personality development is expected.

Course Outcomes:

SEMESTER -1

Core Course-I: Introduction to Poetry: Medieval & Renaissance

1. Students will get an opportunity to develop 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 familiarize the students with different form of poetry.
4. The course will enhance knowledge of English sonnets by Shakespeare, its structure, imagery and metaphors.
5. The course will help in understanding Metaphysical and spiritual poetry, the imagery and metaphysical conceits.

Core Course-II: Classical and Elizabethan Drama

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.
3. The course will familiarize the students with dramas of different eras.
4. The course will help students to know difference between Comedy and Tragedy & Aristotle's contribution in the genre of tragedy.
5. The course will assist in developing knowledge of Greek tragedy, Revenge tragedy and Shakespearean tragedy.

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Core Course-III: Beginnings of the Novel

1. Students will develop acumen to analyze 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 analyze the fiction as a genre.

Elective Course-IV-(i) English Phonetics and Phonology

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.
5. Students will learn about syllable division.

Elective Course-IV-(ii): William Shakespeare: From Stage to Screen

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.
4. This course will help in explaining magical features of play and create interest of students in literature.

SEMESTER -2

Core Course-V: Literary Criticism

1. At the end of 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.

Core Course-VI: Poetry from Neo-Classical to Victorian Age

1. Students will get acquainted with the social, historical, literary and cultural elements of Neo- classical 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.
4. The students will learn about Pre- Raphaelite poetry and its thematic concerns.

Core Course-VII: Nineteenth Century Fiction

1. To enhance 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.
4. The student will learn about creative patterns of writing fiction.

Elective Course-VIII Modern English Grammar and Usage

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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.
4. The course will help to understand sentence formation.

SEMESTER-3

Core Course IX: Literature and Modernity

1: Students would be able to analyze the role of language in creating discourse.

2: Students would be able to interpret the genre of fiction writing during Modern times.

3: Students would examine the extent of capitalism governing everyday lifestyles.

4: Students would be able to evaluate the role of language and how it has transformed over the years.

Core Course X: Twentieth Century Poetry and Fiction

1: Students would extrapolate various historical and philosophical inter-textual references.

2: Students would be able to analyze various literary devices in poetry.

3: Students would be able to recognize the quality of absurdity in novels.

4: Students would be able to comprehend a novel of Existentialism philosophy.

Core Course XI: Literature and Gender

1: Students would be able to detect inter-textual elements in a novel.

2: Students would be able to recognize Indian writing in English.

3: Students would be able to analyze feminism and/or gender theory.

4: Students would be able to classify the texts with autobiographical elements.

5: Students would be able to evaluate the treatment of women throughout history.

Elective Course XII: (i) Literature and Postcoloniality

1. Students would study the theory of Post-Colonialism and how it governs our daily lives.

2. Students will be able to differentiate between various binaries of the theory and their ideologies.

3. Students would recognize the extent of Post Colonialism in the everyday life through the poems.

4. Students would be able to identify cross cultural references and how power operates the discourse.

SEMESTER – 4

Core Course XIII: Literary and Cultural Theory

1: The students will be able to interpret the role of the author in the text.

2: The students would be able to analyze the idea of nation, nationality and nationalism.

3: The students would be able to interpret the condition of Feminist Criticism and place of the literary canon as Readers and Writers.

4: The students will understand the changes brought about by Postmodernism in our perception of things.

GURU NANAK COLLEGE BUDHLADA, District Mansa, Punjab-151502

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Core Course XIV: Indian Writing in English

1: Students would be able to interpret Indian writing in English.

2: Students would be able to analyze various dimensions of Indian English writing in poetry, especially its rustic philosophy.

3: The students would be able to analyze the elements of social problems through Indian writing.

4: The students would be able to interpret the distinctive quality of reading novels published in series.

Core Course XV: American Literature

1: The students would be able to analyze the distinctive quality of expressionist drama in AmericanLiterature.

2: The students would be able to detect the realistic depictions of rural life and American Colloquial speech.

3: The students would be able to recognize the social life in America.

4: The students would be able to examine the relationship among Chinese-American women.

Elective Course XVI: (ii) Language and Linguistics

1: The students would be able to understand the various ways of word formation in English language.

2: The students would be able to analyze the process of language construction from the morphemes.

3: Students would be able to classify various models of grammar throughout the years.

4: Students would be able to classify and understand the set of rules which govern how words arecombined to form phrases and later sentences.

5: Students would be able to classify the change in the due course of language throughout the years.

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Budhlada (Mansa)

GURU NANAK COLLEGE BUDHLADA
Distt. Mansa, Punjab-151502

Department of Commerce

B.Com.

Program Outcome

This program could provide Industries, Banking Sectors, Insurance Companies, Financing companies, Transport Agencies, Warehousing etc., well trained professionals to meet the requirements. After completing graduation, students can get skills regarding various aspects like Financial Manager, Auditors, Cost Accountants, Marketing Manager, and over all Administrationabilities of Companies.

Apart from that this course will enhance the following capabilities of the students:

1. Capability of the students to make decisions at personal & professional level.
2. Students can boost up their Entrepreneurial skills.
3. Students can get thorough knowledge in Accounting, costing, banking and finance with the practical exposure that helps the students to stand in organizations.

Program Specific Outcome

The students will acquire the knowledge, skill in different areas of communication, decision making, innovations and problem solving in day to day business activities. Students will be able to do their higher education and can make research in the field of finance and commerce.

- Students will prove themselves in different professional exams like C.A., C S, CMA, MPSC, UPSC.
- Company Secretary, Teacher, Professor, Stock Agents, Government employments and

Course Outcomes

PSO01: Financial Accounting:

To enable the students to learn principles and concepts of Accountancy with practical applications of accounting like Partnership Accounting, and allied aspects of accounting, and also encourage the students about maintaining the books of accounts for further reference.

PSO02: Marketing Management

This course enables the students, the practical knowledge and the tactics in the marketing, and critically analyzes the basic concepts and the recent changes in the field of marketing.

PSO03: Computer applications in Business

This course makes students familiar with computer environment & operating systems and applications of internet in education of commerce, and also helps to introduce students with accounting packages like tally.

PSO04: Business Statistics

This course will develop skill and knowledge among students in Business Mathematics and Statistics so that they can use and understand useful functions in business as well as the concept of EMI. Apart from that students can learn the applications of matrices in business and how to solve LPP problems to get maximize the profit and to minimize the cost.

PSO05: Business Environment and Entrepreneurship

This course makes the students aware about the Business and Business Environment and developsentrepreneurial awareness among students. On another hand, course will motivate students to maketheir mind set for thinking entrepreneurship as career.

PSO06: Banking and Finance

Banking and Finance course will familiar the students with the fundamentals of banking and thorough knowledge of banking operations, also impart knowledge about functions and role of Reserve Bank of India. One of another objective of this course is to make understandable to the students regarding the new concepts introduced in the banking system.

PSO07: Communication skills in English and Punjabi

This course will develop oral and written communication skills of the students so that their employability enhances, and also understand the process and importance of communication.

PSO08: Business Economics

This course provides students knowledge of Micro and Macro Economic concepts and inculcatesan analytical approach to the subject matter, and also helps to apply economic reasoning to solve business problems. Apart from that this course aware students about Gross National Product (GNP), Net National Product (NNP) ,Income at Factor cost or National Income at Factor Price Per Capita Income , Personal Income (PI) ,Disposable Income etc.

PSO09: Business Organization

This course makes familiar the students with the emerging changes in the modern office environment and to develop organizational skills, and also technical skills among the

students for designing and developing effective means to manage records, consistency and efficiency of workflow in the administrative section of an organization will be developed.

PSO10: Business management

The course will help the students to understand the concept & functions and importance of management and to understand principles, functions and different management theories.

PSO11: Company law

It will impart students with the knowledge of fundamentals of Company Law and provisions of the Companies Act of 2013, and also apprise the students of new concepts involving in company law regime.

PSO12: Cost Accounting

This course will help the students to understand Basic Cost concepts, Elements of cost and cost sheet, and provide knowledge about difference between financial accounting and cost accounting, ascertainment of Material and Labor Cost. Students can get knowledge of different methods and techniques of cost accounting. This course will impart knowledge about the concepts and principles application of Overheads. Student's Capability to apply theoretical knowledge in practical situation will be increased.

PSO13: Business Law (Mercantile Law)

The student will well verse in basic provisions regarding legal frame work governing the business world and know the basic concepts, terms & provisions of Mercantile and Business Laws. The course will develop the awareness among the students regarding these laws affecting trade business, and commerce.

PSO14: Auditing and taxation

After completing this course, the students will be versed in the fundamental concepts of Auditing and different aspects of tax. Students can understand Income Tax system properly, and can get the knowledge of different tax provisions. The course will boost knowledge about preparation of Auditreport, Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961. Students can understand GST Tax system properly, and can get the knowledge of different tax provisions under GST.

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Deptt. Of Comm. & Mgt.
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B.Com. (Honours)

Programme outcome

B. Com. (H) is the best course option for career and jobs in management, teaching, advertising, journalism, mass communication, law, design, public sector, etc.

Programme specific outcome

PSO1- Direct tax, Indirect Tax and Auditing

Taxation Course has been designed to offer skills in a wide range of taxation. There are immensejob opportunities in this field. After holding a degree in this field, a student can take up for a job in both private and government sectors. Professionally, a student can also opt for teaching jobs in colleges and universities.

PSO2- Company Law

Law Job profile candidates who pursue a UG level course in Corporate Law can either pursue a PG level law course with the same specialization or they can even consider pursuing a job. One ofthe most popular job profiles after completing a Corporate Law course is to become a Corporate Lawyer. The corporate lawyer provides assistance to the companies or business firms relating to employees contracts, taxation related issues in an organization, employee relations, labour and corporate employment law etc.

PSO3- Business organization, Functional management and Financial Management

Finance is the lifeline of any business. However, finances, like most other resources, are always limited. On the other hand, wants are always unlimited. Therefore, it is important for a business tomanage its finances efficiently. Business Management is that branch of education which provides knowledge and training pertaining to planning, execution, supervision and analysis of a business enterprise. In this field of education, one learns about the establishment of a company or an organisation, and various functional levels such as production, financial, administrative, human resources, sales & marketing and others.

PSO4- Financial Accounting, Corporate Accounting and Cost Accounting

Accounting is the process of keeping financial accounts. It estimates the economic activities of anorganization and forwards this information to investors, creditors, management and regulators. The field of accounting always remains in demand as it is the backbone of

every business entity. Accountant is needed in every industry. It is one of the respected professions in the world. Numerous options open for the candidates seeking career in accounting. The job of accountants exists in public as well as in private sector. There are enormous job opportunities in this field in India and abroad.

PSO5- Banking operations and Procedures

Banking operations involves the practices and procedures that a bank uses to ensure that customers' transactions are completed accurately and appropriately. Banking provides services to the general public, including mortgages, loans, deposits, and checking accounts.It assists students to avail various job opportunities in Banks as well as in Corporate sector as investment advisors.

PSO6- Entrepreneurship

Entrepreneurs minimize risk through research, planning, and skill development. Small-scale business provides good scope for the growth of entrepreneurial activities. Thereby, inculcates amongst students qualities of a good entrepreneur which are must for the achievement of goals.

Dept. Of Comm. & Mgt.
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GURU NANAK COLLEGE BUDHLADA DIST. Mansa, Punjab-151502

BBA (Bachelor of Business Administration)

Programme Outcome

BBA is one of the most popular bachelor degree programs after 12th. BBA course is the gatewayto various job opportunities in India such as Marketing, Education, Commercial and Governmentto name just a few. The three year professional undergraduate course in Business Management is open to students from the three streams Science, Arts and Commerce. It offers knowledge and training in Management and Leadership skills to prepare them for managerial role and entrepreneurship. Candidates learn various aspects of Business Administration and Management through Classroom Lectures and Practical Project like internship.

Programme Specific Outcome

PSO1: BusinessManagement

It helps to explore the philosophies of Management in practical and improves the planning procedures to obtain optimum results. It enhances knowledge of individual to identify the changingtrends in Business.

PSO2: Business Accounting

It improves basics of students about Business Accounting and provide solutions for structured andunstructured business problems and issues. It prepares to analyze financial statements with the help of various tools and techniques of accountancy.

PSO3: Business Economics

It is helpful to understand background of managerial economics and to develop an understandingof role and function of managers. This subject provides a detailed view of various roles played bycost and revenue in business.

PSO4: Financial Management

Under this course students are able to develop their understanding about determination of patternsof determining capital structure. It improves assessment of working capital needs of the firm and focus on various decisions of the firm like investment, financing and dividend.

PSO5: Human Resource Management

This subject enhances awareness about role of human resource management in organizations andthe factors shaping that role. It is helpful to understand key concepts and theories from the field ofHRM and understand the implications of increasing diversity and globalization for HRM processes.

PSO6: Marketing Management

Under this course students are able to analyze the relationships between marketing management and the political, economic, legal and social policies and its impact on business. It generates knowledge to evaluate the role and relevance of marketing organization in current marketing conditions.

PSO7: Research Methodology

This subject develops understanding about concept of research methodology and judges the reliability and validity of experiments to perform exploratory data analysis. It also sharpens the awareness to use parametric and non-parametric hypothesis tests.

PSO8: Management of Industrial Relations

This subject is beneficial to establish & maintain a sound relationship between the worker & the employer. It is helpful to identify and rectify the simmering issues which might take the form of adispute in the workplace. Under this subject students discuss importance of various acts & their uses in Industrial relations.

PSO9: Workshop on Knowledge and Skills Management

This workshop familiarizes students towards changing methods of communication and improvesthe practical knowledge of them.

PSO10: Training Project and Viva-Voce

It helps students to develop a thorough understanding of the chosen subject area and demonstratethe ability to critically assess/interpret data. It creates an ability to effectively communicate knowledge in a scientific manner.

for Head
Deptt. Of Comm. & Mgt.
Guru Nanak Coll...
Budhlada(Ma...)

M.Com (Master in Commerce)

Program Outcome

It enables a student well skilled in national as well as international trends. The course enables the students for conducting business, accounting and auditing practices, role of regulatory bodies in corporate and financial sectors. To provide in-depth understanding of all core areas specifically Advanced Accounting, Marketing management, Direct Tax, International Accounting, Management and Business Environment, Research Methodology and Tax planning.

Program Specific Outcomes

PSO1: Management Concept and Organization Behavior

It enables the students analyze the implementation of different functions of management. It develops qualities for leadership in decision making process in an organization. It helps to manage work stress. It helps students get an insight into the behavior of individuals and groups in an organization. It inculcates the ability to analyze challenges and opportunities in the field of organization behaviour and also acts as a team leader.

PSO2: Accounting for managerial decisions

It introduces a separate branch of accounting i.e. Management Accounting and its relevance in a business organization. It enables the students to understand Managerial behavior, Control structure and Control Process under different circumstances and also cultivates skills to analyze the financialdata and interpretation of data.

PSO3: Business Economics

It develops an ability to forecast demand in light of changing circumstances and to formulate business plans and to chalk out Business Policies. It grows skills to analyze effects of GovernmentPolicies and to analyze the economic data and present their view on data.

PSO4: Research Methodology

It familiarizes the students about research and research problems. It enables the students to use SPSS for solving the research data and to understand quantitative and qualitative Methods of research. It develops skills to write Research paper.

PSO5: Financial Management

It develops skill to manage financial resources of a company. It provides knowledge about the various sources of finance available to businessmen and also develops ability to select an investment proposal by analyzing the compounded and discounted value of money invested.

PSO6: Advance Accounting

It provides practical knowledge about the application of HRA and Price level accounting in Indian context and inculcate ability to write report with respect to recent trends in published accounts. Italso provides the understanding of the practical use of Accounting Standards in preparation of financial statements.

PSO7: Business Environment

It develops skills to identify and differentiate various Micro and Macro factors affecting functioning of Business. It creates an ability to analyze Indian Economy in light of changing government regulatory policies. It makes understanding of the targets and priorities of five years plans and also provides knowledge about Planning Commission and NITI Aayog.

PSO8: E Commerce

It develops ability to start up and operate e-commerce website. It familiarizes the online paymentservices and different cyber laws. It inculcates the ability to understand customer relationship. It also provides knowledge of cyber world and scope of cyber laws in E-commerce.

PSO9: Seminar

It gives basic orientation towards research and to understand the practical application of theoreticalmodels in the discipline of Commerce, Economics and Business Administration etc. It imparts the knowledge about difference between qualitative and quantitative methods of research while writing a seminar report and to write bibliography of a seminar report citing references from different sources.

PSO10: Financial Institutions & Markets

It creates knowledge of the progress of various components of Indian financial system and clarity of stock market operations and the clearing and settlement procedures of stock exchanges. It givesdetailed understanding about the Banking Structure of the country and its recent developments.

PSO11: Contemporary auditing

It creates ability to calculate Goodwill, evaluate shares adopting different methods and preparation of final accounts of Indian Companies. Students get knowledge about the provisions of appointment, qualifications, duties and liabilities of auditor and to clarify about the applicability of different types of audits.

PSO12: Corporate Legal Framework

Students understand how important it is to communicate clearly with clients and other corporations. Pupils get knowledge about the laws or the role of legal professionals in the creation and operation of a business. Students get knowledge about the laws and regulations which can impact businesses in both positive and negative ways.

PSO13: Direct Tax Law

It helps students to explain different types of income, taxability, expenses and their deductibility.Students able to file income tax return and can differentiate between direct and indirect tax assessment and implication in practical situations.

PSO14: Marketing Management

It familiarizes the students about marketing concepts and contemporary issues and its Philosophies.It develops ability to understand the changing marketing environment and get knowledge of different consumer and business buying behaviours.

PSO15: Human Resource Management

Students are able to understand employee recruitment, selection process and different types of remuneration plans and their significance. It imparts knowledge of different training programs and understanding their limitations and also knowledge regarding the developing role of human resource management in the globalized world.

PSO16: Fundamentals of Investment

Students get knowledge how to design, construct portfolios and also learn techniques of doing investment analysis. Students can identify and study the trends of stock market and also take investment decisions taking into consideration various determinants influencing investment decisions.

PSO17: Banking and Insurance Services

Students understand the operations and working of insurance companies in India and also enhancethe capability to assess the significance of online banking. Students cognize the functions and significance of RBI in India and also acquaint different models of bank assurance in India.

PSO18: Corporate Tax Law & Planning

Students are able to understand the difference between Tax Evasion, Tax Planning and Tax Avoidance and various deductions, rebates and reliefs to reduce the taxable income and tax liability. It develops skill in students to take decisions keeping in view the Income Tax Rules andalso of Double Taxation Avoidance Agreement.

PSO19: International Finance

Students get knowledge about international finance and its theoretical concept and their practical implications. Students are able to understand the exchange rate and their different aspects and also to analyze the causes of historical exchange rate movements, and some of the contributory factors to a variety of financial crises, with reference to the models covered. Pupils are able to apply the theories and models covered to the issue of optimal currency areas, with specific reference to the design and operation of the euro.

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Department of Science

Program: B.Sc. Medical

Course Outcomes

Semester-I

Course: Organic Chemistry

CO1: The main aim of this course is to provide the ground information of the organic chemistry. Learners will be able to understand the structure and bonding of the organic compounds by learning the various effects such as inductive effect, resonance effect, hyper conjucation etc.

CO2: To make students capable of understanding and studying the classification of the organic compounds and impart the students a thorough knowledge about the mechanism of the reactions which determines the completion of the reactions.

Course: Inorganic Chemistry

CO1: This would facilitate students to get the knowledge about the Planck constant and describes that how the wavelength of the particle is calculated. It describes the wave mechanical model of the atom. It helps to know that how many electrons are present in the particular space.

CO2: Students will make understanding with the periodic table and the terms related with that and also describes the trends that how they vary with along the period and downthe group.

CO3: This will provide the knowledge of the noble gas family and their compound formation as well as reactivity.

CO4: It intends the chemical bonding.

Course: Physical Chemistry

CO1: The main outcome of this course is to provide information about Mathematical concepts so that medical students would not face any difficulty in derivations and Students learn to solve differentiation, Integration of different functions which enhance their problem solving ability.

CO2: Students learn to find out errors in their Practical and how to correct them. Moreover, students learn to find out errors in their Practical and how to correct them .This course aims at knowledge of problems related to standard deviation and applicability of F-test and Q-test.

CO3: This course facilitates how to differentiate between different states of matter. Students also develop an idea of liquid and gaseous states in which they learn the structural differences in solids, liquids and gases.

CO4: This course aims at knowledge of gases and the most important Vander waals equation. The most interesting and useful topic 'Joule-Thomson effect' of this course tells the liquefaction of gases and the concept of Inversion Temperature.

CO5: This course facilitates the learners to grab knowledge about structure of molecules and their magnetic properties.

Semester-II

Course: Organic Chemistry

CO1: To make students capable of understanding and studying the classification of the organic compounds. To impart the students a thorough knowledge about the mechanism of the reactions which determines the completion of the reactions.

CO2: It provides the description of the allyl and aryl halides and their uses in various fields. The seproperties help to describe the melting and boiling points of many compounds and their reactivity towards various reactions.

CO3: It intends the naming reactions with different functional groups. The Concept of isomerism deals with the nature of organic compounds. It gives the knowledge about the Chirality which is the necessary condition for the chirality of the molecules; it deals with the different orientations of the compounds and with different names of the compounds. By using these configurations we can find the nature of compounds.

Course: Inorganic Chemistry

CO1: Students will understand concept of close packing, ionic structures and factors affecting ionic solids which help them to identify and distinguish between differentcrystals.

CO2: students will develop understanding about the properties of alkali and alkaline earth metals.

CO3: it would enable the learner to learn about the structure of diborane, lewis acid nature of borontrihalides, preparation of carbides, nitrides & other relevant block compounds.

CO4: This course helps in understanding preparations and applications of fullerene, fluorocarbons, silicate compounds.

CO5: It makes the students to learn and understand about types of oxides and oxyacids, their structure and reactivity in s block & p block elements, interhalogen compounds, polyhalides compounds.

Course: Physical Chemistry

CO1: The main outcome of this course is to enable the students to understand about solutions used in daily life and methods of expressing their concentration.

CO2: By studying this course learners will be able to think about the nature of solutions and their stability which would be help them about the advantages and applications of various types of solutions.

CO3: This course aims at knowledge of different factors affecting rate of reaction and role of acidand base as a catalyst.

Semester-III

Course: Inorganic Chemistry

CO1: Develop the knowledge of transition metals to understand the trends in properties and reactivity of the first series of d-block elements and to know the typical physical and chemical properties of the transition metals.

CO2: To study the lanthanide elements to understand the trends in properties and reactivity and to develop the understanding of the typical physical and chemicalproperties of the transition metals.

CO3: To explain the typical physical and chemical properties of the transition metals especially from second and third transition series. To identify simple compound classesfor transition metals and describe their chemical properties.

CO4: In order to study transition metals to understand the trends in properties and reactivity of the actinides and its typical physical and chemical properties to understand its applications.

Course: Organic Chemistry

CO1: This course will facilitate the learners to classify the types of these functional groups bynomenclature.

CO2: Through the structure and classification of the compounds containing these functional groups, they would be able to make comparison between the reactivity ofthese compounds.

CO3: This course allows the students to outline the mechanism of various reactions of organic molecules containing the above mentioned functional groups.

CO4: It would help in research work and to develop new chemical reaction with different methods.

CO5: They would be able to grab the knowledge about various naming reactions and they will learn about their applications in field of chemistry.

Course: Physical Chemistry

CO1: They will grab knowledge of the basic concept of thermodynamics.

CO2: They will learn how to solve exact and inexact functions.

CO3: Students will get information regarding thermo chemistry in daily life activities.

CO4: Students will be able to get knowledge of the conversant processes of steam Dryness.

CO5: They will learn about uses of thermodynamics in daily life like in window A.C and refrigerators.

Semester-IV

Course: Inorganic Chemistry

CO1: Students will be able to understand the applications of various types of complex and their properties.

CO2: Develop the knowledge of various processes which proceed through the oxidation and reduction and they will able to know the applications of these reactions.

CO3: It will develop the understanding of all type of acid and bases and explain the behavior .

CO4: Students will be able to understand the applications of various non aqueous solvents and their properties with chemical behavior.

Course: Organic Chemistry

CO1: Students will learn about the method of preparation, properties and uses of carboxylic acid along with their characteristic test.

CO2: Students will learn about the method of preparation, properties and uses of derivatives of carboxylic acid along with their characteristic test.

CO3: Students will learn about the method of preparation, properties and uses of ether along with epoxides.

CO4: Students will learn about the method of preparation, properties and uses of fats along with their commercial application.

CO5: Students will learn about the method of preparation, properties and uses of Organic compounds containing Nitrogen along with their distinguishable test.

Course: Physical Chemistry

CO1: Phase diagrams are useful because they allow us to understand in what state matter exists under certain conditions. Phase equilibrium has wide range of applications in industries including production of different allotropes of carbon, lowering of freezing point of water by dissolving salt, purification of components by distillation, usage of emulsions in food production, pharmaceutical industry

CO2: Conductivity measurements are used routinely in many industrial and environmental applications as a fast, inexpensive and reliable way of measuring the ionic content in a solution.

CO3: These articles are depends on the movement of the boundary between two adjacent electrolytes under the influence of an electric field and the speed of the moving boundary can be measured and used to determine the ion transference numbers.

CO4: Nernest equation can be used to find the cell potential at any moment in during a reaction or at conditions other than standard-state, by knowing this students can determine the equilibrium constant or Gibbs free energy .In Concentration Cell students can know about how we can select anode or cathode. Nernest equation can be used to find the cell potential at any moment in during a reaction or at conditions other than standard-state, by knowing these students can determine the equilibrium constant or Gibbs free energy. In Concentration Cell students can know about how we can select anode or cathode and also how e.m.f be calculated from those. Students will also learn about that how we can prevents our metallic things from corrosion.

Semester-V

Course: Inorganic Chemistry

CO1: Students will be able to use Crystal Field Theory to understand the magnetic properties (and in simple terms the color) of coordination compounds which facilitatethem to describe the shapes and structures of coordination complexes with coordination numbers 6 and 4.

CO2: Learner will develop the understanding of the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters from them. They will be able to describe rate of reactions of complexes and type of reactions in complexes.

CO3: Student will be able to describe magnetic properties of complexes, various kind of magnetic materials and effect of temp on magnetic characters. They will also able to describe methods of determining magnetic moments.

CO4: Student will be able to describe quantum numbers, orbital and spin angular moment of electrons. And To understand electronic transition, term symbol andconcept of spectra.

Course: Organic Chemistry

CO1: It will make the learner to develop interest about the Synthesis, Properties and applications of Organo-metallic compounds.

CO2: Students will learn about the Synthesis and Properties Organo-Sulphur compounds and their comparison with analogous compounds.

CO3: Students will learn about the Principle, working and application of UV-Vis spectroscopy which will help them study the conjugation in organic compounds.

CO4: Students will learn about the Principle, working and application of IR spectroscopy which will enable them to detect the various Functional groups in organic compounds.

CO5: Students will get knowledge about Principle, working and application of NMR spectroscopy which will help them in structure elucidation through C13-NMR & PMR.

Course: Physical Chemistry

CO1: The main outcome of this course is to provide information about Quantum Mechanics and Spectroscopy .and Quantum Chemistry enables them to know about Schrodinger equation and its application.

CO2: Students learn about rotation & vibration spectroscopy and the electromagnetic radiations used in these spectra. And Through rotational spectroscopy they will learn the energy level diagrams of rigid & non rigid rotors. This course aims at applications of rotational and vibrational spectroscopy.

Semester- VI

Course: Inorganic Chemistry

CO1: On the completion of course the student will have knowledge of Pearson's HSAB concept, acid-base strength and hardness and softness. Symbiosis, theoretical basis of hardness and softness.

CO2: The aim of the course is the teaching and understanding of the basic principles of Biological Inorganic Chemistry - Bioinorganic Chemistry that are considered necessary for the completion of postgraduate students' education. Also, the aim of this course is to present and describe bioinorganic systems through the correlation of the function, structure and activity of inorganic elements within the organisms. In particular, this course will include: a) a systematic study of trace element biosystems; b) the effect of the concentration of trace elements on health and the environment.

CO3: On the completion of course the students have knowledge of Silicones and Phosphazenes as examples of inorganic polymers, nature of bonding in triphosphazenes.

CO4: The focus of this course is on the synthesis, structure and bonding, properties and reactivity of main group organometallics (including Grignard reagents, organolithium reagents, organotin compounds, etc), organotransition metal chemistry and organometallic catalysis. And On the completion of course the student have knowledge of metal-ethylene complexes and homogeneous hydrogenation, mononuclear carbonyls and the nature of bonding in metal carbonyls.

Course: Organic Chemistry

CO1: Students would have knowledge about the structure, preparation and properties of heterocyclic compounds after completion of this course.

CO2: The main focus of this course is to make the Students familiar with the classification, synthesis and application of various polymers.

CO3: Students will learn the importance of enolates as starting material in organic synthesis.

CO4: Students will get knowledge about the classification, conversion and application of carbohydrates.

CO5: Students will learn about the classification, conversion and application of protein.

Course: Physical Chemistry

CO1: To make them familiar in the study of surfaces and of heter interfaces between constituent's layers.

CO2: On completion of this course they will know about the orbital concept.

CO3: Helpful in determination of the geometrical structure of molecules in triplet state.

CO4: Study is helpful for structure identification.

CO5: Student able to know how laser and masers are work which are used in wide range of field.

CO6: Student would be able to study the structure using X-rays .

CO7: Complete study about structure for the compounds used in daily life.

CO8: laws study helpful in research work.

CO9: Mechanism of different processes is studying.

CO10: Daily used light applications.

CO11: Students able to know how the energy transfers in different processes.

Head
Deptt. Of Science
Guru Nanak College
Budhlada (Mansa)

B.Sc. (Non-Medical)

Programme Specific Outcomes

PSO1. B.Sc. Non-Medical student is able to concentrate on Chemistry, Physics, Computer and Mathematics.

PSO 2. A non-medical student will demonstrate a scientific knowledge of the core physics principles in Mechanics, Electromagnetism, Modern Physics, and Optics.

PSO3. He is able to demonstrate basic manipulative skills in algebra, geometry, trigonometry, and beginning calculus.

PSO4. The student will determine the appropriate level of technology for use in: experimental design and implementation, analysis of experimental data and numerical and mathematical methods in problem solutions.

PSO5. He will be able to apply the underlying unifying structures of mathematics (i.e. sets, relations and functions, logical structure) and the relationships among them.

PSO6. He can investigate and apply mathematical problems and solutions in a variety of contexts related to science, technology, business and industry, and illustrate these solutions using symbolic, numeric, or graphical methods.

PSO7. The student will acquire knowledge of Chemical Thermodynamics, Kinetics, Electrochemistry, Atomic Structure, Organic Chemistry, Spectroscopy and Skill in Industrial Chemistry.

PSO8. A non-medical student can join Indian Air Force, Indian Navy and can also go for other competitive exams. He can go for higher studies in Mathematics, Chemistry, and Physics.

PSO9. He can join as a scientist in research institutes of immense knowledge having a great scope for growth and development. He can prove to be an asset for the society by producing something more innovative.

PSO10. He can demonstrate a basic understanding of computer hardware and software.

Course Outcomes

Semester I

Course: Coordinate Geometry

CO1: Understand the graph of vertical and horizontal conic.

CO2: Model real-world situations by using conics For example Architects and engineers frequently use the shape of a parabola for support arches in bridges and buildings.

CO3: To graph, use the information that we can determine from its equation and add points to obtain a pattern for the curve.

CO4: Identify the condition for them to be parallel or perpendicularCO5: Recognize line androtational symmetries.

Course: Differential Equations

CO1: Learn and explain the concept of differential equation.

CO2: Classify the differential equation with respect to their order and linearity.

CO3: Recognize and solve a homogeneous, non homogeneous and an exact differential equation.

CO4: Identify ordinary and singular points.

CO5: Work with ordinary differential equation and system of ODE in various situations and usecorrect mathematical terminology notation and symbolic processes in order to engage in work, study.

Course: Calculus-I

CO1: Interpret a function from an algebraic, numerical, graphical and verbal perspective.

CO2: Compute derivatives, integrals.

CO3: Analyze a function using derivatives in concavity, convexity, curvature and integrals in rectification, hyperbolic function.

CO4: Recognize the appropriate tools of calculus to solve applied problems.

CO5: Use properties to definite integral to solve graphical net area problems.

Course: Electricity and Magnetism-I

CO1: Read, understand and interpret the mathematical formulation in Physics- verbal, mathematical and graphical and solve numerical problems involving topics covered.

CO2: Differentiate vector fields and determine gradient vector fields to find out potential functions.

CO3: Evaluate line integrals, surface area, surface integrals and its applications on Stokes and divergence theorem.

CO4: To learn the concepts of charge interaction with each other using Coulomb's Law and applies to problems in both one and two dimensions.

CO5: To learn the definition of the electric field, E and derive the electric field due to a point charge using Coulomb's Law.

CO6: Derive the electric field for continuous charge distributions using an integral approach. Configurations should include one dimensional configuration (ring of charge, line of charge) and at dimensional configuration (charged disk).

CO7: To introduce Gauss' Law and clearly understand how to apply it and its use to calculate the electric field due to various configurations including: point charge, line of charge, uniformly charged sphere and sheet of charge.

CO8: To develop an understanding of electric potential by considers electric potential energy,equipotential surfaces and how they relate to electric field lines.

CO9: To derive a relationship between electric potential and the electric field calculate the electric potential and its use to calculate electric potential around a single point charge.

CO10: To learn how to apply the above formula in order to calculate electric potential dueto various charge distributions including multiple point charges and a line of continuous charge.

CO11: To understand where to use Laplace's and Poisson's equations.

CO12: To know what the electric field and electric potential in, and around, a conductor and Insulator and how electrical energy is stored in capacitors and to learn the formula for calculating this energy.

CO13: Derivation of Uniqueness theorem and where can it use.

CO14: To learn the definition of current in terms of electron flow and learn the definition ofresistance Rand Ohm's law.

CO15: To learn about electrical power and how to calculate the power dissipated by a resistor.

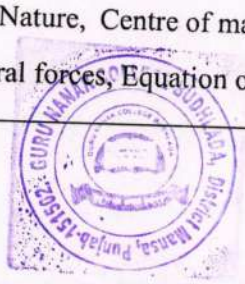
CO16: To learn the definitions of, and relations between, the following quantities: the current density J, the electric field, E, within the conductor, the resistivity, and the drift velocity ofthe electrons in the conductor.

Course: Mechanics-I

CO1: Grasped the fundamentals of Cartesian and spherical polar co-ordinate systems, area, volume, displacement, velocity and acceleration in these systems, Solid angle.

CO2: Learned various forces in Nature, Centre of mass, and Equivalent one body problem.

CO3: Learned the basics of Central forces, Equation of motion under central force,



equation of orbit in inverse square, Force field and turning points, Kepler laws and their derivations.

CO4: Learned the Relationship of conservation laws and symmetries of space and time. Inertial frame of reference. Coriolis force and its applications.

CO5: Learned the Variation of acceleration due to gravity with latitude. Focault pendulum (qualitative).

CO6: Learned the Elastic collision in Laboratory and C.M. system, velocities, angels andenergies, Crosssection of elastic scattering . Rutherford scattering (qualitative).

Course: Vibration and Waves – I

CO1: The main objective of this subject is to aware the students about various phenomenon ofwaves and optics.

CO2: This subject describes the Phenomenon like interference.

CO3: Under the Interference phenomenon students will study the young double slit experiment, Fresnalbiprism , double mirror , Newton rings and fabry perot interferenceexperiments.

CO4: This subject describes the Diffraction Phenomenon.

CO5: In diffraction students will study Fresnal diffraction by half period zones experiment, Zone plate, Fraunhoffer diffraction method, diffraction with single and double slit and Resolving power of grating and telescope.

CO6: This subject provides the basic idea of Phenomenon like Polarization.

CO7: In the polarization students will study the different types of Polaroid like polarization with refraction and reflection phenomenon.

CO8: Understand various phenomenon and the cause or origin of them.

Course: Organic Chemistry

CO1: The main aim of this course is to provide the ground information of the organic chemistry. Learners will be able to understand the structure and bonding of the organic compounds by learning the various effects such as inductive effect, resonance effect, hyper conjucation etc.

CO2: To make students capable of understanding and studying the classification of the organiccompounds and impart the students a thorough knowledge about the mechanism of the reactions which determines the completion of the reactions.

Course: Inorganic Chemistry

CO1: This would facilitate students to get the knowledge about the planck constant and describes that how the wavelength of the particle is calculated. It describes the wave mechanical model of the atom. It helps to know that how many electrons are present inthe particular space.

CO2: students will make understanding with the periodic table and the terms related with that and also describes the trends that how they vary with along the period and down the group.

CO3: This will provide the knowledge of the noble gas family and their compound formation aswell as reactivity.

CO4: It intends the chemical bonding.

Course: Physical Chemistry

CO1: The main outcome of this course is to provide information about Mathematical concepts so that medical students would not face any difficulty in derivations and Students learn to solve differentiation, Integration of different functions which enhance their problem solving ability.

CO2: Students learn to find out errors in their Practical and how to correct them .Moreover, Students learn to find out errors in their Practical and how to correct them .This course aims at knowledge of problems related to standard deviation and applicability of F-test andQ-test.

CO3: This course facilitates how to differentiate between different states of matter. Students also develop an idea of liquid and gaseous states in which they learn the structural differences insolids, liquids and gases.

CO4: This course aims at knowledge of gases and the most important vander waals equation. The most interesting and useful topic 'Joule-Thomson effect' of this course tells the liquefaction of gases and the concept of Inversion Temperature.

CO5: This course facilitates the learners to grab knowledge about structure of molecules and their magnetic properties.

Semester-II

Course: Analytic Geometry

CO1: Learn that Use geometrical result to determine unknown angles and radius, centre and use of example of ball and knife as sphere and cut the plane in 3D form of sphere, cone.

CO2: Identify the condition for the plane and the straight line to be parallel orperpendicular and parameterize curves.

CO3: Applying model real-world situations by using conics For example Architects andengineers frequently use the shape of a conic for support arches in bridges

and buildings.

CO4: Recognize line and rotational symmetries.

Course: Partial Differential Equation

CO1: Classify partial differential equations and transform into canonical form.

CO2: Solve linear partial differential equations of both first and second order.

CO3: Apply specific methodologies, techniques and resources to conduct research and produce innovative results in the area of specialization.

CO4: Extract information from partial derivative models in order to interpret reality.

CO5: Identify real phenomena as models of partial derivative equations.

Course: Algebra-I

CO1: Understand and express a complex numbers both in rectangular form and in terms of its modulus and argument.

CO2: As the result of studying topics, students will be able to understand in different ways the meaning of multiplications of whole numbers and use this to make sense of complex number multiplication and expansion.

CO3: Recognize a number on an argand diagram in terms of its modulus and argument

CO4: Develop the insight that when numbers are multiplied their moduli are multiplied and Their arguments are added together.

CO5: Use this to discover that when a number is raised to a power its modulus is raised to that power.

Course: Electricity and Magnetism-II

CO1: In this subject students will describe the behavior of various substances in magnetic field.

CO2: Students will be able to define B, M and H .also explain their relation to free and bound currents.

CO3: Students will discuss orbital motion of electrons, diamagnetism, electron spin, and paramagnetism.

CO4: In this subject students will discuss ferromagnetism along with Domain theory of Ferromagnetism.

CO5: Students will be able to state Biot Savart's law, Ampere's Circuital law, Faraday's Law and EM induction. Discuss their applications.

CO6: Students will be able to define and explain divergence, curl of B, Hall effect and vectorpotential.

CO7: Students will be able to define and drive current density, Displacement current, Mutual inductance, reciprocity theorem and Self inductance L along with use of current density incalculation of change in magnetic field at a current sheet.

CO8: Students will list transformation equations for E and B from one frame to another.

CO9: In this subject students will learn to derive the Maxwell's equations.

CO10: In this subject students will discuss the Analysis of LCR series and parallel resonantcircuits along with Q-factor. Power consumed

Course: Mechanics-II

CO1: Describe rigid body motion .Explain Rotational motion, principle moments and axes.

CO2: State and explain Euler's equations for precession and elementary gyroscope.

CO3: Describe Galilean transformation and invariance and Illustrate Non-Inertial frames.

CO4: Outline the concept of stationary universal frame of reference and ether.

CO5: Explain the concept of Michelson-Morley Experiment and its result.

CO6: List the Postulates of special theory of relativity.

CO7: Describe the Lorentz transformations, Observer and viewer in relativity, Relativity of simultaneity along with Length, Time and Velocities.

CO8: Discuss the Relativistic Doppler effect. Variation of mass with velocity, mass-energyequivalence, rest mass in an inelastic collision.

CO9: Describe the Relativistic momentum and energy, their transformation.

CO10: Explain the concepts of Minkowski space, four vectorformulation.

Course: Vibration and waves-II

CO1: In this part of subject students will be able to define Stiffness coupled oscillators alongwith normal co-ordinates and normal modes of vibration.

CO2: Students will learn how to explain the inductance coupling of electricaloscillators.

CO3: Students will be able to list the types of waves and derive the solution of wave equation.

CO4: They will study how to illustrate the string as forced oscillator and find characteristic impedance and impedance matching condition.

CO5: They will study how to illustrate the string as forced oscillator and find characteristic impedance and impedance matching condition.

CO6: Students will discuss Reflection and transmission energy, standing waves, wave and group velocity in case of vibrating string.

CO7: Students will be able to state the Physical interpretation of Maxwell's equations.

CO8: Discuss the electromagnetic waves and wave equation in a medium having finitepermeability and permittivity but with conductivity equal to zero.

CO9: Students will discuss the response of a conducting medium of EM waves and define poyntingvector.

CO10: Students will be able to explain the Reflection and transmission of EM waves at a boundary of two dielectric media and for the surface of a conductor at normal incidence.

CO11: In this part of subject students will learn way to describe behavior of EM waves in a conducting medium, skin depth and EM waves velocity in a conductor an anomalous dispersion.

Course: Organic Chemistry

CO1: To make students capable of understanding and studying the classification of the organiccompounds. To impart the students a thorough knowledge about the mechanism of the reactions which determines the completion of the reactions.

CO2: It provides the description of the allyl and aryl halides and their uses in various fields. These properties helps to describes the melting and boiling points of many compounds and their reactivity towards various reactions.

CO3: It intends the naming reactions with different functional groups. The Concept of isomerismdeals with the nature of organic compounds. It gives the knowledge about the Chirality which is the necessary condition for the chirality of the molecules, It deals with the different orientations of the compounds and with different names of the compounds. By using these configurations we can find the nature of compounds.

Course: Inorganic Chemistry

CO1: Students will understand concept of close packing, ionic structures and factors affectingionic solids which help them to identify and distinguish between different crystals.

CO2: students will develop understanding about the properties of alkali and alkaline earth metals.

CO3: it would enable the learner to learn about the structure of diborane, lewis acid nature of borontrihalides, preparation of carbides, nitrides & other relevant block compounds.

CO4: This course helps in understanding preparations and applications of fullerene,fluorocarbons, silicate compounds.

CO5: It makes the students to learn and understand about types of oxides and oxyacids, their structure and reactivity in s block & p block elements, interhalogen compounds, polyhalidescompounds.

Course: Physical Chemistry

CO1: The main outcome of this course is to enable the students to understand about solutionsused in daily life and methods of expressing their concentration.

CO2: By studying this course learners will be able to think about the nature of solutions and their stability which would be help them about the advantages and applications of various types of solutions.

CO3: This course aims at knowledge of different factors affecting rate of reaction and role of acid and base as a catalyst.

Semester III

Course: Analysis-I

CO1: Describe fundamental properties of the real numbers that lead to the formal development of analysis.

CO2: Analysis the process of examining information in order to make conclusions regarding limit and continuity

CO3: Identify the area when break the number of interval.

CO4: Recognize the major things to do question on suppositions such as: uniformly, uniqueness limit.

CO5: Use uniformly and apply it to appropriate depth of required critical thinking.

Course: Statics

CO1: An ability to construct free-body diagrams and to calculate the reactions necessary to ensure static equilibrium.

CO2: Understand the flexible cables in contact with smooth curve, Analyze equilibrium of aparticle, systems of particles and their properties.

CO3: Recognize friction as a force and differentiate statics friction and slidingfriction.

CO4: Understand of the analysis of distributed loads.

CO5: Demonstrate and understand of two force and three force members and analyze momentsdue to a couple.

Course: Advanced Calculus

CO1: Learn about the basic principles of multi-variable calculus with proofs.

CO2: To have full knowledge of calculus involving the fundamental tools such as continuity and differentiability.

CO3: Reason rigorously in mathematical arguments. They can follow abstract mathematical arguments and write their own proofs.

CO4: Effectively communicate mathematics: reading, writing, listening, and speaking. Students make effective use of the library, conduct research and make oral and written presentationof their findings.

CO5: To know relationship between the increasing and decreasing behavior of function.

Course: Optics

CO1: The main objective of this subject is to aware the students about various phenomenon ofwaves and optics.

CO2: This subject describes the Phenomenon like interference.

CO3: Under the Interference phenomenon students will study the young double slit experiment, Fresnalbiprism , double mirror , Newton rings and fabry perot interference experiments.

CO4: This subject describe the Diffraction Phenomenon .

CO5: In diffraction students will study Fresnal diffraction by half period zones experiment, Zone plate, Fraunhoffer diffraction method, diffraction with single and double slit andResolving power of grating and telescope.

CO6: This subject provides the basic idea of Phenomenon like Polarization.

CO7: In the polarization students will study the different types of Polaroid like polarization with refraction and reflection phenomenon.

CO8: Understand various phenomenon and the cause or origin of them.

Course: Quantum Mechanics-I

CO1: To study the basics and principles of quantum mechanics.

CO2: The student will understand the uncertainty relations and applications.

CO3: Student will learn Schrodinger equation and their applications.

CO4: Student will understand the concept of wave function.

CO5: Explain the operator formulation of quantum mechanics.

CO6: Solve Schrodinger equation for simple potentials (Potential Step, Linear HarmonicOscillator etc.)

CO7: Student will study about Hydrogen atom (Energy levels, eigen functions, degeneracy, Angular Momentum)

Course: Statistical physics and thermodynamics-I

CO1: This subject basically provides the basic idea of probability to the students. There areways of calculating probability for various statistical systems of particles.

CO2: The objective is to apply the principles of probability in distribution of particles in various systems and to calculate thermodynamic probability.

CO3: This subject provides the detailed information about the distribution of n distinguishableparticles in number of compartments of (i) equal sizes and (ii) unequal sizes.

CO4: In this subject Students will basic ideology of phase space, microstate, macro state.

CO5: The course gives the insight of postulates and applications of statistical physics.

CO6: Students will learn the main three types of statistics distribution (Maxwell Boltzmann, Bose Einstein and Fermi Dirac statistics). Student will learn which particles follow which statistics and why.

CO7: The aim is to apply these statistical distributions in real life problems and understandtheir problems.

CO8: Students will learn How the many real system are related through such theoretical knowledge to practical one (Example tossing the coins, throwing dice etc.)

Course: Inorganic Chemistry

CO1: Develop the knowledge of transition metals to understand the trends in properties andreactivity of the first series of d-block elements and to know the typical physical and chemical properties of the transition metals.

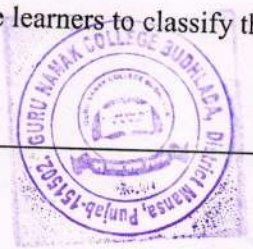
CO2: To study the lanthanide elements to understand the trends in properties and reactivity andto develop the understanding of the typical physical and chemical properties of the transition metals.

CO3: To explain the typical physical and chemical properties of the transition metals especially from second and third transistion series. To identify simple compound classes for transitionmetals and describe their chemical properties.

CO4: In order to study transition metals to understand the trends in properties and reactivity of the actinides and its typical physical and chemical properties to understand its applications.

Course: Organic Chemistry

CO1: This course will facilitate the learners to classify the types of these functional



groups bynomenclature.

CO2: Through the structure and classification of the compounds containing these functional groups, they would be able to make comparison between the reactivity of these compounds.

CO3: This course allows the students to outline the mechanism of various reactions of organic molecules containing the above mentioned functional groups.

CO4: It would help in research work and to develop new chemical reaction with differentmethods.

CO5: They would be able to grab the knowledge about various naming reactions and they will learn about their applications in field of chemistry.

Course: Physical Chemistry

CO1: They will grab knowledge of the basic concept of thermodynamics.

CO2: They will learn how to solve exact and inexact functions.

CO3: Students will get information regarding thermo chemistry in daily life activities.

CO4: Students will be able to get knowledge of the conversant processes of steam dynss

CO5: They will learn about uses of thermodynamics in daily life like in window A.C and refrigerators.

Semester IV

Course: Analysis-II

CO1: Memorize definition of directional derivatives and gradient and illustrate geometric meanings with the aid of sketches.

CO2: Memorize theorem relating directional derivatives to gradient and reproduce proof.

CO3: Calculate directional derivate and gradients.

CO4: Apply gradient to solve problems involving normal vectors to level surfaces.

CO5: Explain the concept of vector integration a plane and in space.

Course: Dynamics

CO1: Ability to construct free-body diagrams.

CO2: Solve mechanics problems in one dimension that involve one or more of the forces of gravity, friction and air resistance

CO3: Understand of the analysis of distributed loads.

CO4: knowledge of internal forces and moments in members.

CO5: Apply Newton's law to solve the problems.

Course: Numerical Methods

CO1: Learn an algebraic or transcendental equation using an appropriate numerical method.

CO2: Proficient in implementing numerical methods for a variety of multidisciplinary applications.

CO3: Perform an error analysis for a given numerical method.

CO4: Derive numerical method for various mathematical operations and tasks, such as interpolation, differentiation , integration , the solution of linear and nonlinear equations and the solutions of differential equations.

CO5: Understand of common numerical analysis and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.

Course: Lasers

CO1: The students will learn to define and derive Einstein's relations and basics of laser

CO2: The Student can discuss Broadening of spectral lines and identify natural, collision and Doppler broadening

CO3: In this subject Students will able to express the line width, line profile, absorption and amplification of parallel beams of light passing through medium.

CO4: Students will able to explain elementary theory of optical cavity, three and four levellaser and properties of laser.

CO5: This subject will describe the ruby laser and Nd Yag laser

CO6: Students will able to explain types of gas lasers like helium neon and CO2 laser.

CO7: In this subject Students will able to express liquid laser like Dye laser, semi conductorlaser, Q-switching and different types of shutters.

CO8: Students will able to explain mode locking, Holography, and applications of laser.

Course: Quantum Mechanics-II

CO1: This subject describes the interaction of radiation with matter and transition probability.

CO2: This subject explains the fine and hyperfine structure of hydrogen atom.

CO3: This subject states and illustrates the Normal Zeeman Effect and Anomalous Zeeman Effect.

CO4: In this subject Students will learn to define spin orbit interaction and spin orbit coupling.

CO5: The subject helps to identify symmetric and antisymmetric wave functions, state PauliExclusion Principle and electronic structure of an atom.

CO6: This subject describes and explains the various spectra like Absorption spectra, Molecular Spectra, Rotational Spectra and Raman spectra.

CO7: This subject briefly explains the Mosley law and Auger effect.

CO8: The subject explains the coupling schemes and selection rules.

CO9: This subject describes and explains the various spectra like Absorption spectra, Molecular Spectra, Rotational Spectra and Raman spectra

CO10: The student will describe and explain the frank hertz experiment and stern gerlach experiment.

Course: Statistical Mechanics and Thermodynamics-II

CO1: The students will learn to define entropy and explain its laws.

CO2: This subject explains the reversible and irreversible process.

CO3: This subject describes and explains the laws of thermodynamics and their applications.

CO4: The students learn to state and explain Carnot cycle and its working

CO5: The students learn to express Maxwell thermo dynamical relations.

CO6: The students can define and illustrate adiabatic stretching, adiabatic compression and Adiabaticde magnetization.

CO7: The subject provides outline details of Thermo dynamical treatment of Joule-Thomson effect and its use.

Course: Inorganic Chemistry

CO1: Students will be able to understand the applications of various types of complex and their properties.

CO2: Develop the knowledge of various processes which proceed through the oxidation and reduction and they will able to know the applications of these reactions.

CO3: It will develop the understanding of all type of acid and bases and explain the behavior of these.

CO4: Students will be able to understand the applications of various non aqueous solvents and their properties with chemical behavior.

Course: Organic Chemistry

CO1: Students will learn about the method of preparation, properties and uses of carboxylicacid along with their characteristic test.

CO2: Students will learn about the method of preparation, properties and uses of derivatives of carboxylic acid along with their characteristic test.

CO3: Students will learn about the method of preparation, properties and uses of etheralong with epoxides.

CO4: Students will learn about the method of preparation, properties and uses of fats along with their commercial application.

CO5: Students will learn about the method of preparation, properties and uses of Organic compounds containing Nitrogen along with their distinguishable test.

Course: Physical Chemistry

CO1: Phase diagrams are useful because they allow us to understand in what state matter existsunder certain conditions. Phase equilibrium has wide range of applications in

industries including production of different allotropes of carbon, lowering of freezing point of water by dissolving salt, purification of components by distillation, usage of emulsions in food production, pharmaceutical industry.

CO2: Conductivity measurements are used routinely in many industrial and environmental applications as a fast, inexpensive and reliable way of measuring the ionic content in asolution.

CO3: These articles are depends on the movement of the boundary between two adjacent electrolytes under the influence of an electric field and the speed of the moving boundarycan be measured and used to determine the ion transference numbers.

CO4: Nernest equation can be used to find the cell potential at any moment in during a reaction or at conditions other than standard-state, by knowing these students can determine the equilibrium constant or Gibbs free energy .In Concentration Cell students can know about how we can select anode or cathode. Nernest equation can be used to find the cell potentialat any moment in during a reaction or at conditions other than standard-state, by knowing these students can determine the equilibrium constant or Gibbs free energy. In Concentration Cell students can know about how we can select anode or cathode and also how e.m.f be calculated from those. Students will also learn about that how we can prevents our metallic things from corrosion.

Semester-V

Course: Algebra-I

CO1: Recognize the mathematical objects called groups, matrix, quaternions, symmetric,cyclic groups, even and odd permutations.

CO2: Extend group structure to finite permutation groups.

CO3: Explain the significance of the notions of cosets, normal subgroups, and factor groups, Homomorphisms, Isomorphism and Cayley's Theorem.

CO4: Analyze consequences of Lagrange's theorem including Fermat's Little theorem.

CO5: Familiarize with the concept of Rings, Sub-rings, Homomorphism, ideals and Quotient Rings, Field of Quotient of Integral domain, division rings.

Course: Number Theory-I

CO1: Understand about divisibility, g.c.d, Fundamental Theorem of arithmetic, congruences, residue and reduced residue classes.

CO2: Recognize about Euler-Fermat, Wilsons's, Chinese Remainder theorem.

CO3: learn the definition of congruences, primitive roots, indices, quadratic residues, Legendre Symbol.

CO4: Familiarize with Euler's criterion, Gauss Lemma., Quadratic reciprocity Law, Jacobi Symbol.

CO5: Apply Arithmetic functions and Mobius inversion Formula.

Course: Discrete Mathematics-I

CO1: Understand the concept of Pigeonhole principle, Basic counting principles, permutations and combinations of sets and multi sets, Binomial and multinomialtheorems.

CO2: Analyze the concept of inclusion and exclusion principle.

CO3: Applying the concept of Graph Theory, Eulerian and Hamiltonian trails and cycles. Bipartite multigraphs.

CO4: Familiarize with Trees, Algorithms for BFS and DFS trees weighted Graphs, Greedy and Prim's Algorithm.

CO5: Determine the concept of Digraphs, Planar graphs, Euler formula and Chromatic numbers.

Course: Condensed Matter Physics-I

CO1: Distinguish between various types of crystal structures and crystal systems for their best use in various technological applications.

CO2: Relationship between atomic radius (R) and lattice parameter (a) that helps to study thestructure of various crystal systems.

CO3: Calculation of Atomic Packing Factor (APF) and Volume density (ρ) that interpreted as a measure of the stability of the nucleus.

CO: 4Determination the Indices for 'Directions' and 'Planes' in a crystal structure.

CO5: Study of Bragg's Law of Diffraction to find the interplaner spacing (d-spacing) of acrystal that used for identification and characterization purposes.

CO6: Determination of Reciprocal lattice to understand the important properties and behaviorof the various crystal systems.

CO7: Study of the Brillion Zones for the theoretical understanding of the elementary ideas of electronic energy bands in solids.

CO8: Study of structure factor and form factor which is a mathematical description of how a material scatters incident radiation.

Course: Electronics-I (Electronics and Solid State Devices)

CO1: Distinguish between P-N junction and Zener diode and Practical applications of thesesdiode in daily life.

CO2: Distinguish between half and full wave rectifier and where they can be used or using in present time in electronics industry.

CO3: Study of different configuration of transistor and their characteristics.

CO4: Practical utilization of transistor for development of various other electronics equipment.

CO5: Study of the JFET and MOSFET and how they are different from BJT.

CO6: Study of various photoconductive devices like LED, Photo diode and Solar celland their applications.

Course: Nuclear and Radiation Physics

CO1: This is a branch of Physics which deals with the phenomena taking place in the nuclear domain. Students will be given an insight into the invention and dimensions of a nucleus.

CO2: Students are able to determine the charge, mass of any nucleus by using various Spectrographs.

CO3: Students will learn the methods to find the mass and charge of any nucleus. The aim is totell them about the stability of nucleus and various other properties.

CO4: In this subject students will study various nuclear models (Shell model, Liquid drop model etc.).

CO5: The students will learn about various types of radiations and their interaction with matter.

CO6: The subject is able to teach students about various types of nuclear reactions, propertiesand their energetic.

CO7: In this subject students will be able to study artificial radioactivity.

CO8: They will study various ways to calculate different kinds of decay.

CO9: This course has led the students to understand interaction of various types of radiation with matter which they observe in their daily life. It's easy for them now to relate the theory to practical.

Course: Inorganic Chemistry

CO1: Students will be able to use Crystal Field Theory to understand the magnetic properties (and in simple terms the colour) of coordination compounds which facilitate them to

describe the shapes and structures of coordination complexes with coordination numbers6 and 4.

CO2: Learner will develop the understanding of the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters from them. They will be able to describe rate of reactions of complexes and type of reactions in complexes.

CO3: Student will be able to describe magnetic properties of complexes, various kind of magnetic materials and effect of temp on magnetic characters. They will also able to describe methods of determining magnetic magnetic moments.

CO4: Student will be able to describe quantum numbers, orbital and spin angular momenta of electrons and to understand electronic transition, term symbol and concept of spectra.

Course: Organic Chemistry

CO1: It will make the learner to develop interest about the Synthesis, Properties and applications of Organo-metallic compounds.

CO2: Students will learn about the Synthesis and Properties Organo-Sulphur compounds and their comparison with analogous compounds.

CO3: Students will learn about the Principle, working and application of UV-Vis spectroscopy which will help them study the conjugation in organic compounds.

CO4: Students will learn about the Principle, working and application of IR spectroscopy which will enable them to detect the various Functional group in organic compounds.

CO5: Students will get knowledge about Principle, working and application of NMR spectroscopy which will help them in structure elucidation through C13-NMR & PMR.

Course: Physical Chemistry

CO1: The main outcome of this course is to provide information about Quantum Mechanics and Spectroscopy .and Quantum Chemistry enables them to know about Schrodinger equation and its application.

CO2: Students learn about rotation & vibration spectroscopy and the electromagnetic radiations used in these spectra. And Through rotational spectroscopy they will learn the energy level diagrams of rigid & non rigid rotors. This course aims at applications of rotational and vibrational spectroscopy.

Semester VI

Course: Algebra-II

CO1: Analyze vector spaces and subspaces over a field and their properties.

CO2: Understand span of a set and its properties.

CO3: Analyze linear dependence and independence odd sets.

CO4: Determine matrix associated with a linear map and analyze linear transformations.

CO5: Understand factorization, associates elements, irreducible elements, euclidean domain, Principal ideal domain, unique factorization domain, polynomial rings and their properties.

Course: Number Theory-II

CO1: Understand the concept of Diophantine equations, Farey sequences, continued Fractions, Approximation of reals by rationals, Pell's equations.

CO2: Analyze the concept of Minkowski's theorem in Geometry of Numbers and its application to Diophantine inequalities.

CO3: Familiarize with Hermite's theorem on minima of positive definite quadratic forms and its applications to representation of a number.

CO4: Apply the euler summation formula, abel's Identity, elementary results on distribution of primes.

Course: Discrete Mathematics-II

CO1: Write and interpret mathematical notation and mathematical definitions.

CO2: Analyze the concept of Generating function solution of recurrence relations using difference equations and generating functions.

CO3: Recognize Boolean AIgebras-Lattices and Algebraic Structures. Duality. Distributive and Complemented Lattices.

CO4: Computing Boolean Functions and Expressions. Prepositional Calculus.

CO5: Gain an historical perspective of the development of modern discrete mathematics.

Course: Nuclear and Particle Physics

CO1:-Students can list out some Energy loss Phenomenon due to ionization (Bethe's formula),Energy loss of electrons, Bremsstrahlung

CO2:-Student can explain Interactions of gamma rays with matter.

CO3:-The students are expected to learn about the principles and basic constructions of particle accelerators such as the Van-de-Graff generator, cyclotron, betatron and synchrotron. They should know about the accelerator facilities in India.

CO4:-Students can illustrate detectors of nuclear radiations- the Geiger-Mueller counter, the scintillation counter, the photo-multiplier tube, the solid state and semiconductor detectors.

CO5:-Gain knowledge on the basic aspects of particle Physics – the fundamental interactions, elementary and composite particles.

CO6:-Students can list out Categories of particles: leptons, hadrons (baryons and mesons), quarks, gaugebosons.

CO7:-The students should know about the quantum numbers of particles: energy, linear momentum, angular momentum, isospin, electric charge, colour charge.

CO8:-Learn about the strangeness, lepton numbers, baryon number and the conservation laws associated with them.

Course: Condensed Matter Physics-II

CO1: In this subject, students come to know How to define harmonic nature of Lattice vibrations. Lattice vibrations have a basic concept of understanding the momentum transfer inlattice.

CO2: In this subject, students come to know about the Concepts of phonons, Scattering ofprotons by phonons.

CO3: In this Subject students can understand the phenomenon of Vibration of mono-atomic, di-atomic, linear chains. In this subject students can easily describe the concept of Density of modes.

CO4: This chapter deals with the specific heat capacity of solid, Einstein and Debye models of specific heat.

CO5: This chapter deals with movement of electrons in solid, free electron model of metals. Free electron, they will be able to state Fermi gas and Fermi energy.

CO6: In this chapter students identify about Metals and insulators, Conductivity and its variation with temperature in semiconductors with the help of Kronig-Penney Model.

CO7: This chapter discuss about the Fermi levels in intrinsic and extrinsic semiconductors,Qualitative discussion of band gap in semiconductors.

CO8: Nowadays superconductivity has the great importance in many physical areas. In this chapter students can state the Magnetic field effect in superconductors, BCS theory, and Thermal properties of super conductors.

Course: Electronics-II

CO1: Student can discuss various power electronics devices like Thyristor, SCR, TRIAC, DIAC.

CO2: In this chapter students comes to learn about Construction, Characteristics and Operation; Comparison between transistors and thyristors; Difference between SCR and TRIAC.

CO3: Student can describe UJT: its construction, Equivalent circuit, Characteristics and parameters, uses.

CO4: Students can outline some properties about Thermistor: Types, Construction, Characteristics, Uses, Advantages over other temperature sensing devices.

CO5: By completing this chapter students can learn about IMPATT and TRAPATT devices, PIN diode: Construction, Charatersitics, Applications.

CO6: Study of Gunn effect and diodes: Mechanism, Characteristic, Negative differentialresistivity and Domain formation.

CO7: Tunnel diode is a topic of great importance, students learn about Tunneling Phenomenon, Operation, and Applications. Merits and Drawbacks.

CO8: The primary need of all electronic devices is Transistor. Here students can list out some important uses of transistor. In this, students can learn about Transistor biasing: Stabilization of operating point, fixed bias, Collector to base bias, Bias circuit with emitter resistor, Voltage divider biasing circuit.

CO9: Describe CE amplifier: Working and analysis using h-parameters, Equivalent circuits,Determination of current gain, Power gain, Input impedance, FET amplifier: Voltage, Current and Power gain.

Course: Nuclear and Particle Physics

CO1: Students can list out some Energy loss Phenomenon due to ionization (Bethe's formula), Energy loss of electrons, Bremsstrahlung.

CO2: Student can explain Interactions of gamma rays with matter.

CO3: The students are expected to learn about the principles and basic constructions of particle accelerators such as the Van-de-Graff generator, cyclotron, betatron and synchrotron.They should know about the accelerator facilities in India.

CO4: Students can illustrate detectors of nuclear radiations- the Geiger-Mueller counter, the scintillationcounter, the photo-multiplier tube, the solid state and semiconductor detectors.

CO5: Gain knowledge on the basic aspects of particle Physics – the fundamental interactions,elementary and composite particles.

CO6: Students can list out Categories of particles: leptons, hadrons (baryons and mesons), quarks,gaugebosons.

CO7: The students should know about the quantum numbers of particles: energy, linearmomentum, angular momentum, isospin, electric charge, colour charge.

CO8: Learn about the strangeness, lepton numbers, baryon number and the conservation laws associated with them.

Course: Inorganic Chemistry

CO1: On the completion of course the student will have knowledge of Pearson's HSAB concept, acid-base strength and hardness and softness. Symbiosis, theoretical basis of hardness and softness.

CO2: The aim of the course is the teaching and understanding of the basic principles of Biological Inorganic Chemistry - Bioinorganic Chemistry that are considered necessary for the completion of postgraduate students' education. Also, the aim of this course is to present and describe bioinorganic systems through the correlation of the function, structure and activity of inorganic elements within the organisms. In particular, this coursewill include: a) a systematic study of trace element bio systems; b) the effect of the concentration of trace elements on health and the environment

CO3: On the completion of course the student have knowledge of Silicones and Phosphazenes as examples of inorganic polymers, nature of bonding in triphosphazenes.

CO4: The focus of this course is on the synthesis, structure and bonding, properties and reactivity of main group organometallics (including Grignard reagents, organolithium reagents, organotin compounds,etc), organotransition metal chemistry and organometallic catalysis. And On the completion of course the student have knowledge of metal-ethylene complexes and homogeneous hydrogenation, mononuclear carbonyls and the nature of bonding in metal carbonyls.

Course: Organic Chemistry

CO1: Students would have knowledge about the structure, preparation and properties of heterocyclic compounds after completion of this course.

CO2: The main focus of this course is to make the Students familiar with the classification,synthesis and application of various polymers.

CO3: Students will learn the importance of enolates as starting material in organic synthesis

CO4: Students will get knowledge about the classification, conversion and application of carbohydrates.

CO5: Students will learn about the classification, conversion and application of protein

Course: Physical Chemistry

CO1: To make them familiar in the study of surfaces and of heterinterfaces between constituents layers.

CO2: On completion of this course they will know about the orbital concept.

CO3: Helpful in determination of the geometrical structure of molecules in triplet state.

CO4: Study is helpful for structure identification.

CO5: Student able to know how laser and masers are work which are used in wide range of field.

CO6: Student would be able to study the structure using X-rays.

CO7: Complete study about structure for the compounds used in daily life.

CO8: Students would be able to know the reactions occurrence in which state.

CO9: laws study helpful in research work.

CO10: Mechanism of different processes is studying.

CO11: Daily used light applications.

CO12: Students able to know how the energy transfers in different processes.

CO13: Student able to know how laser and masers are work which are used in wide range of field.

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M.Sc. Chemistry

Program Specific Outcomes

PSO1 Gain complete knowledge about all fundamental aspects of all the elements of chemistry.

PSO2 Understand the background of organic reactions, techniques used for analysis of mechanism, complex chemical structures, various intermediates with their detailed discussion and Stereochemistry involved in organic reactions.

PSO3 Appreciate the importance of various elements present in the periodic table, coordination chemistry, structure of molecules, properties of compounds, theoretical understanding of various topics like Formation of Covalent bond, Hybridization, Organometallic, Bioinorganic Chemistry, Group Theory and Character tables to identify the all features of the particular compounds.

PSO4 Gather attention about the physical aspects of atomic structure, dual behavior; quantum Chemistry, Chemical Kinetics; reaction pathways with respect to time, various energy transformations; significance of electrochemistry & thermodynamics.

PSO5 Students from Biology background learn about vectors and Matrix Algebra, Coordinate Geometry, Trigonometry, Calculus, Elementary Differential Equations and Permutation and Probability.

PSO6 Students from Mathematics background get awareness for Bio molecules i.e Proteins, Carbohydrates, Amino acids and their Properties to familiarize with the both living and non-living Organisms.

PSO7 Knowledge of theoretical and experimental concepts of C language, Decision & ControlStructure.

Course Outcomes:

Semester-I

Course: Physical Chemistry

CO1 Students will know the Basic concepts of Ist, IInd laws of thermodynamic andentropy.

CO2 Students will develop understanding of activity and fugacity

CO3 Students will learn Concept of absolute entropy.

CO4 Students will relate Thermodynamics with living system.

CO5 Students will be provided with basic knowledge of statistical thermodynamics at microscopic level.

CO6 Students will be cleared with basics of electrochemistry, ion -solvent interactions.

CO7 Students will develop interest for fundamentals of electrochemistry, activity and activity coefficient, Debye Onsager theory.

CO8 Students will take keen interest for basic concept of electrical

double layer.

CO9 Students will understand various applications of electrochemistry.

Course: Inorganic Chemistry

CO1 Students would know quantum mechanical approach to different types of molecule and ions and its application to find the energy of the system.

CO2 Students will gather information about various types of complexes containing different types of ligands having different nature through the theories of bonding in transition metal complexes.

CO3: Students would learn magnetic behavior of various transition complexes with orbital splitting.

CO4: Students would collect detailed information of the spectral properties of the complexes and application in determining the nature and shapes of metal complexes.

CO5: Students will be able to get the information about the various types of biological enzymes and their chemistry with appropriate structures and Uses of various metals in body functioning.

Course: Organic Chemistry

CO1: Students will be getting brief idea about various intermediates like carbocation, carbanion, carbane, nitrene, benzyne and free radicals involve during chemical reaction.

CO2: students able to explain various reactions like polymerisation, halogenation, addition reaction and auto oxidation in which free radical involved as intermediate.

CO3: students will be acquainted with nature of bonding in organic molecules and they will get familiar with various techniques used for determination of reaction mechanism.

CO4: Students will be able to explain various elimination reactions, their mechanism, stereo chemistry and their orientation.

CO5: Students will learn various types of pericyclic reactions like Cycloaddition, Electrocyclic reactionand Sigmatropic rearrangement with their mechanism and stereochemistry.

Course: Mathematics for Chemists

CO1. Use the concepts of permutations, combinations and probability to understand the statistical nature of entropy.

CO2. Use algebra and calculus to support the study of statistical thermodynamics.

CO3. Use trigonometric functions to understand the concept of diffraction.

CO4. Use matrix and vector methods, as well as complex numbers to help inunderstanding diffraction patterns from crystal structures.

Course: Biology for Chemists

CO1: Students would be provided with the structural and functional description of cells and its organelles along with the concept of fertilization and metabolism.

CO2: Students would study the formation of bio molecules like carbohydrates and proteins andhow they play major roles in the body.

CO3: Students would understand the formation, types and functioning of lipids in the body andwould be able to describe how they are derived from their precursors.

CO4: Students would deal with various biocatalysts of body ie enzymes which enhance the biochemical reactions.

CO5: Students would be able to draw & understand the structure of the nucleic acids like DNAand RNA ie genetic material which help in the Inheritance.

Semester-II

Course: Inorganic Chemistry

CO1: Students will be able to develop the understanding of various complexes containing different types of metals and ligands with their properties and also will be able to find out nature of these types of compounds by spectroscopic study.

CO2: Students would be able to explain symmetry of a plane figure and some bounded three-dimensional figures and would also determine whether a given set and binary operation form a group by checking group axioms

CO3: Students will be able to understand the various concepts of group theory and will developthe imaginative power. Moreover, they will be able to apply this concept in field of spectroscopy.

Course: Physical Chemistry

CO1: Students would know basics of Quantum mechanics which is critically important for understanding how individual atoms combine covalently to form molecules

CO2: Students would be able to correlate quantum numbers with Spherical Coordinates and further they would understand concept of orbital and shapes of orbital

CO3: Students would get idea about both perturbation theory and variation method which provide good results in approximating the energy and wave functions of multi-electron atoms.

CO4: Students would know about eigen values and eigen functions

CO5: Students would understand the reaction mechanisms and transition states by studying Chemical kinetics.

Course: Organic Chemistry

CO1: Students will be getting idea regarding Configurations, their representations & conversions

CO2: Students will be made familiar with Confirmations, Neighboring group participation, pyrolysis of acetate, xanthates and amine oxide

CO3: Students will be able to explain geometrical isomerism (E&Z Nomenclature), Determination of curtin-Hammet principle, study of physical properties of isomers, addition to C-C multiple bonds

CO4: Students will get information regarding various types of reduction like wolf kishner reduction, clemmenson reduction, Meerwein Pondroff Varley reduction, Wittig's Reaction, Mechanism of condensation reaction involving enolates (Aldol, Knoevengel, Mannich, perkin and stobbe reactions

Program: M.Sc. Physical Chemistry

Program Specific Outcomes

The master's specialization, Physical Chemistry, will give student in-depth knowledge about macroscopic, atomic, subatomic and particulate phenomena in chemical systems in terms of the principles, practices and concepts of physics such as motion, energy, force, time, thermodynamics, quantum chemistry, statistical mechanics, analytical dynamics and chemical equilibrium.

PSO1: Explain statistical physics and thermodynamics as logical consequences of the postulates of statistical mechanics

PSO2: Gain knowledge of various spectroscopic techniques which are the key instruments of research life to find and study the structure of various molecules in all science streams

PSO3: Improve the Skill in physical research area

PSO4: Relate the concepts of how solar light act as incredible source for life survival and various concepts which build up future in research to save environment by using new techniques toutilize natural energy.

PSO5: Develop understanding of the range and theories of instrumental methods available in analytical chemistry, an understanding of the role of the chemist in measurement and problem solving in chemical analysis

PSO6: Identify the crucial building materials viz Polymers and catalysts which are very important in everyone's daily life and industry life

PSO7: Familiarize the skill of identifying crystalline phases of various materials even at atomic level qualitatively and quantitatively

PSO8: Explain the concepts of physics and physical chemistry for various phenomena occurring in- biological systems and the supra-molecular structure of these systems

PSO9: Understand the professional and safety responsibilities residing in working on environmental problems

Program: M.Sc. Organic Chemistry

Program Specific Outcome

The master's specialization, Organic Chemistry, will give student in-depth knowledge about Organic reactions which are used in a vast way in nature and with a focus on principles for effective synthesis strategies, stereos electivity, catalysis, as well as metal organic chemistry. This course gives the student the theoretical basis of organic reaction and also helps them to find a way to carry out these types of reaction. It gives the quantitative ideas about the synthesis, properties and uses of organic compounds.

PSO1: Understand chemical and molecular processes that take place in organic reactions, Study of photochemistry & Learn Pericyclic reaction

PSO2: Improve the Skill in organic research area

PSO3: Use modern .methods when planning strategies for synthesis of new substances and characterization of products.

PSO4: Master and use modern methods of synthesis and conduct sometimes extremely advanced experiments, the synthesis of complex molecular structures and handling sensitive chemicals.

PSO5: Modern theoretical and experimental methods used to study problems of molecular structure and bonding; emphasis on spectroscopic techniques.

PSO6: Synthesis of Natural products and drugs by using proper mechanisms.

PSO7: Develop understanding of the range and theories of instrumental methods available in analytical chemistry, an understanding of the role of the chemist in measurement and problem solving in chemical analysis

PSO8: Familiarize with heterocyclic chemistry and realizing the importance of heterocyclic compounds.

PSO9: Understanding of the professional and safety responsibilities residing in working on environmental problems.

M.Sc. Chemistry II Physical Specialization

Course Outcomes

Semester III

Course: Fundamentals of Spectroscopy

CO1: The main outcome of this course is to provide knowledge of interaction of radiation with matter, solution of schrodinger wave equation

CO2: Through this outcome, students are able to get knowledge of rigid rotator & non rigid rotator and application of this spectra to find moment of inertia of molecules

CO3: Students grab the knowledge of vibrational spectra which is used for the detection of various functional groups

Course: Fundamental & Atmospheric Photochemistry

CO1: Students will learn about the different laws of photochemistry and there importance in calculation of quantum yield

CO2: Students will learn the ways to find term symbols for gound and excited state, and various photo physical and photochemical processes

CO3: To understand photop hysical processes of sulphur, oxygen and halogens

CO4: Students will learn various electronic transitions and the selection rules

CO5: Students also learn the coupling of rotational vibrational spectra and intensities of spectrallines.

CO6: Students go through raman spectra which is used for structure elucidation of those compounds for which other spectros copies don't work.

CO7: Students tend to know the various electronic transitions occurred in electronic spectra of molecules and application of this part for structure elucidation of molecules.

CO8: The outcome of this course is the study of NMR spectra which gives detailed information of electronsin particular atom in a molecule.

CO9: Students learn about ESR spectra which is also responsible for structure elucidation by showing lines that occurs due to splitting by neighbouring electrons.

Course: Statistical Thermodynamics

CO1: The primary objective of this course is to develop familiarity with the physical concepts and facility with the mathematical methods of quantum mechanics. The aim of statistical mechanics is the evaluation of the laws of classical thermodynamics for macroscopic systems using the properties of its atomic particles. In addition to the classical thermodynamic the statistical approach provides information on the nature of statistical errors and variations of thermodynamic parameters.

CO2: In this students will compare Quantum mechanics and Classical Mechanics that quantum mechanics is about the physics of very small things, molecules and smaller. Classical mechanics is about macroscopic things. Also they go through the concept of Stability and Force of Interaction, Like the bonding potential energy, the stability of an arrangement of atoms is a function of the Lennard-Jonesseparation distance.

CO3: Debye postulated that there is a continuous range of frequencies that cuts off at a maximum frequency, which is characteristic of a particular solid. They will find out the relation of entropy with temperature and other parameters. Students will be able to discuss and explain evidence for the movement of molecules.

CO4: The objective of thermoelectric phenomenon is that it is used to create a heat flux between the junction of two different types of materials and by studying the relative current density and thermoelectric

potential, students will understand that minimum entropy production can be obtained when the thermoelectric potential is a specific, optimal value them

CO5: Students will learn various photo oxygenation reactions

CO6: Students will get knowledge about the application part of photochemistry

CO7: Students will understand the structure of atmosphere, various pollutants present in it and the various ways to control and monitor those pollutants

M. Sc. Chemistry II Organic Specialization

Course Outcomes

Semester III

Course: Analytical Chemistry

CO1: Students will learn different scale of operation of chemical analysis and various steps involved in quantitative analysis

CO2: Students will get to know what is the importance of selecting a representative sample and different criterion of a good sampling plan, Stratified sampling Vs. random sampling. How variance is minimized in stratified sampling, what are the sampling plan for solids, liquids and gases

CO3: Students will understand What are different Errors in chemical analysis, how Minimizationof errors occur, Difference b/w accuracy and precision.

CO4: Students will be familiarized with Statistical terms viz Q test, t test, F test, mean, std deviation, variance correlation and Regression, linear regression. Analysis of variance

CO5: Students will know what is Polarography, Different types of currents residual, Migration, diffusion, polarographic maximum, Dropping Mercury Electrode, polar graphic wave and Ilkovic equation & deviations, Amperometric titrations & Biampometric titrations

CO6: Students will be able to explain Alternating current, Square Wave, pulse (normal and Differential), Tensometry, radio frequency and computer controlled polarograph.

CO7: Students will be familiarize with Chronoptentiometry.

CO8: Students will acquire knowledge of Thermogravimetric analysis.

CO9: Students will be able to differentiate b/w Differential Thermal analysis and differential scanning calorimetry on line analysis.

CO10: Students will learn Thermometric titrations.

CO11: Students will understand basics of Spectrophotometry and Colorimetry, Beer's law, Photometric accuracy.

CO12: Students will know basic principles of Solvent extraction, synergistic extraction, Ion pair formation Methods of extraction and their applications in analytical chemistry.

CO13: Students will learn to apply uses of Ion Exchange Resins and Ion exchange chromatography in analytical chemistry (a) Total cartion Conc in tap water (b) Cu (II) from a brine solution U (VI) by liquid ion exchanger (d) use of mixed solvents.

Course: Photochemistry and Pericyclic Reactions

CO1: This course aims at providing acquire knowledge on Pericyclic reactions, organic photochemistry and their further applications in organic synthesis.

CO2: On the completion of the course students will have the understanding of basics of organicphotochemistry and pericyclic reactions.

CO3: Various theories governing these pericyclic reactions will help them to predict the productswith stereochemistry involved in these reactions.

Course: Chemistry of Natural Products

CO1: Students will learn about the use of dehydrogenation technique for structure determinationof natural products.

CO2: Students will acquire knowledge about the use of various degradation techniques for structure determination of natural products.

CO3: Students will acquire knowledge about the use of oxidation technique for structure determination of natural products.

CO4: Students will learn about the chemical synthesis of natural products using various reagents.

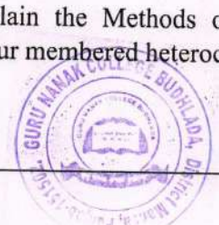
CO5: They will learn how we synthesize natural products biosynthetically using acetate pathwayand mevalonic acid path way.

CO6: Students will learn about the chemical synthesis of natural products using various reagents.

Course: Heterocyclic Chemistry

CO1: This course gives the quantitative ideas about the synthesis, properties and uses of such heterocyclic compounds like Oxirane, Aziridine and thirane

CO2: Students will be able to explain the Methods of formation, physical and chemical properties and applications of four membered heterocyclics with one hetero atom



CO3: Students will be familiar with the Methods of formation, physical and chemical properties and applications of five membered heterocyclics with two hetero atom

CO4: Students will be able to explain the Methods of formation, physical and chemical properties and applications of six membered heterocyclics with two hetero atom

CO5: Students will be able to explain molecular rearrangement in some heterocyclic compounds like ringcontraction1, 2 rearrangements in heterocyclic system and aromatic rearrangements

Course Outcomes

Semester-IV

Course: Applications of Organic Molecular Spectroscopy

CO1: Provide the basic knowledge of orbitals & electronic transitions involved in UV spectra.

CO2: Students grab the knowledge of solvent effect & conjugation effect and structure elucidation of organic compound through UV.

CO3: Students also get to know about modes of vibration & factors affecting vibrational frequency in IR spectra.

CO4: Through IR spectroscopy, students learn to identify functional groups in organic compounds.

CO5: Students are able to find molecular mass & molecular formula of organic compounds.

CO6: Students learn various fragmentations associated with functional groups.

CO7: The study of NMR spectra which is used for structure elucidation of compounds.

CO8: Students learn 13C NMR spectra which deals with DEPT, proton decoupled resonance whichare also used for structure elucidation of compounds.

CO9: Study of 2-D spectra which includes NOSY, COSY, HETCOR is also a part of course outcomes.

Course: Organic Synthesis

CO1: Students will learn about disconnection approach. How to proceed for disconnection of certain molecules involving carbon hetero atom bond. They will also learn about the terms like umpolung and protection of various functional groups.

CO2: Students will be able to understand the C-C disconection in alcohols ,1,3 -difunctional compounds , 1,5 -dicarbonyl compounds, natural products.

CO3: Students will get knowledge about the types of pericycllic reactions specially diels-alderreaction

CO4: This topic will aware students about the formation of C-Cbond. They will learn about the alkylation of enmines.

CO5: They will learn about the various methods of formation of alkenes.

CO6: They will learn about what type of reactions are shown by carbonyl compounds.

Course: Modern Synthetic Reactions and Rearrangements

CO1: Students will get brief idea regarding various reactions, mechanism and applications used for fictionalization of non activated carbon.

CO2: Students will be familiar with the new applications of organosilicon compounds in synthesis.

Course: X-Ray Diffraction and Other Techniques

CO1: students will know about the structural parameters like unit dimensions.

CO2: student will be able to know about the distance between the different compounds.

CO3: Students will be able to identify the structure of different compounds used in daily life.

CO4: Students will acquire the knowledge of charge on compounds when their ions move.

CO5: student will be able to know the colour of the compounds.

CO6: student will be able to explain the use of X-rays in daily life.

CO7: Students will learn different method used to identify the structure which is useful in research work.

CO8: Students will be able to determine the bulk composition.

CO9: students will be made able for accurate measurements .

CO10: Students will learn to use phase identification of a crystalline material.

CO11: Students will study the variation in optical rotation of a substance means with their rotation.

CO12: Students will be able to find the absolute configuration of metal complexes means like in proteins storage complexes.

CO13: Students will be able to explain use of X-Rays in solids for observing the signals.

CO14: Students will be able to use extraction process and check the water detergents ration in pump.

CO15: Students will apply the concepts in geology for identifying the composition of Fe containing specimens.

CO16: Students will be able to use this concept for improving catalytic activity.

CO17: Students will be able to observe the Doppler Effect by using theory of relativity.

Course: Biophysical Chemistry and Advanced Spectroscopy

CO1: In this students will analyze about folding transition and the functional transitions between useful states are encoded in the linear sequence of amino acids, and a long- term goal of structural biology is to be able to predict both the structure and function of molecules from the information in the sequence.

CO2: Students will learn about the basic principle of laser operation that is to create conditions so that the population at a higher level is more than that in the ground state, they will also learn about main difference between a maser and a laser.

CO3: Mass spectrometry is an analytical tool useful for measuring the mass-to-charge ratio (m/z) of one or more molecules present in a sample. These measurements can often be used to calculate the exact molecular weight of the sample components as well. While studying Mass spectrometry students will learn about this powerful technique with a myriad of different applications in biology, chemistry, and physics, but also in clinical medicine and even space exploration.

CO4: Photoelectron spectroscopy is a useful analytical tool used by chemists to determine the electronic structure of atoms and molecules, student will also learn that it is used to measures the elemental composition at the parts per thousand range, chemical state and electronic state of the elements that exist within a material.

Course: Polymers and Surface Chemistry

CO1: Students will be able to explain classification, kinetic study and mechanism involved in step polymerisation

CO2: Students will be familiar with kinetics and mechanism of radical chain polymerisation , Copolymersation and theories of emulsion polymerisation

CO3: Students will be get idea how to calculate number average and weight average molecular weight and various methods used to calculate that

CO4: Students will be able to explain adsorption and various theories like Langmuir adsorptionisotherm, BET adsorption isotherm for unimolecular and multimolecular layers

CO5: Students will be familiar with kinetics of heterogenous reaction at solid surface, catalyst, its types, salt effects and spectroscopic methods like PES, AES, LEED to determine surface structure

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M.Sc. Physics

Programme Specific Outcomes

PSO1: Understand the depth knowledge of various subjects of Physics.

PSO2: Demonstrate skills and competencies to conduct wide range of scientific experiments.

PSO3: Identify their area of interest in academic and R&D.

PSO4: Perform job in various fields' viz. science, engineering, education, banking, business and public service, etc. with precision, analytical mind, innovative thinking, clarity of thought and expression, systematic approach.

PSO5: integrate and utilize concepts and techniques learned in Physics, Mathematics, and Chemistry courses including the essentials of mechanics, electromagnetic theory, quantum mechanics, and statistical mechanics (single, multivariable, and vector) calculus, ordinary differential equations, linear partial differential equations, linear algebra, and complex analysis

PSO6: Apply physical and mathematical principles to describe and explain phenomena in the fundamental and applied sciences.

PSO7: Obtain necessary and desired information from research books, journals, and people to solve problems.

Course Outcome

Semester- Ist

Course: Mathematical Methods of Physics-I

CO1: This subject provides knowledge about various mathematical tools employed to study physics problems.

CO2: Student will study beta and gamma functions, their evaluation andrelations.

CO3: The students will study Legendre Polynomial and their properties.

CO4: This subject describes the special functions (Bessel functions of first and second kind,)and their recurrence relations.

CO5: The students will be able to use complex numbers and variables, Cauchy-Riemann conditions, Cauchy's Integral formula, Laurent expansion, Taylor's series Singularities,Calculus of residues.

CO6: This subject provides information about tensor and its basic operations

CO7: Under Tensors student will study different types of tensors (Contra variant and covariant) tensors, Application of tensors in coordinate transformations.

CO8: Student will study numerical methods (bisection method, Newton method etc) tosolve set of equations.

Course: Classical Mechanics

CO1: Define and understand basic mechanical concepts related to the momentum of system of particles; angular momentum of system of particles; energy of the particles; the work of internal forces and internal potential energy; work of external forces and external potential energy; motion relative to the center of mass (momentum, angular momentum, kinetic energy) discrete and continuous mechanical systems.

CO2: Describe and understand Virtual work and D'Alembert's principle.

CO3: The Lagrange equations for holonomic and nonholonomic systems and Hamiltonian approaches in classical mechanics.

CO4: Describe and understand Hamilton's equations of motion equations for system like simple and compound pendulum, Harmonic oscillator, Motion of particle in central force field etc.

CO5: Describe and understand the statics of rigid bodies; tensor of inertia; principal moments ofinertia; Euler equations of motion; motion of the Earth; precession; Euler angles.

CO6: Kinematics and Dynamics of rigid body in detail and ideas regarding Euler's equations ofmotion.

CO7: Poisson brackets; canonical transformation, Poisson bracket relations between componentsof linear and angular momenta and relative problems.

Course: Classical Electrodynamics

CO1: Understand basic about the Electrostatics problems

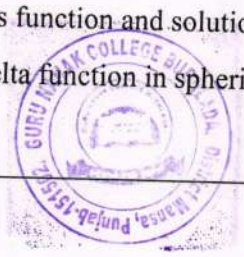
CO2: Develop the Ability to solve the problems regarding electric field.

CO3: Observe the effect of boundary conditions like Dirichlet and Neumann boundary conditions, Uniqueness theorem

CO 4: Observe the effect of Boundary value problems in electrostatics and its applications.

CO 5: Understand the operation of Green's function and solution of Poisson equation

CO 6: Understand the problem of Dirac delta function in spherical polar coordinates



CO 7: Formulate and employ the Equations of electrostatic field in a dielectric, Bound chargedensities.

CO 8: Acquire knowledge on Magnetostatics and solve the problems like Bio savart law and amperes law.

CO 9: Develop knowledge on Time varying fields.

Course: Nuclear and Particle Physics

CO 1: This course has led the students to understand interaction of various types of radiation with matter which they observe in their daily life. It's easy for them now to relate the theory to practical.

Students are also able to understand the detecting methods and instruments for different types of charged and neutral particles.

CO 2: This gives the detail study of alpha decay process and shows how alpha spectroscopy can help us to understand nuclear structure.

CO 3: This gives the detail study of beta decay process and various selection rules for process.

CO 4: In this students will learn the gamma decay process and their energetic and also the selection rules.

CO 5: Students will learn about the classification and properties of elementary particles. Also learn about the properties of fundamental forces.

CO 6: This gives the information about types of interactions and conservation of charge, parity and time reversal in these processes.

CO 7: In this students learn about discovery and properties of Pions and their exchange interactions.

CO 8: In this students learn about k-mesons about their discovery and decay modes and also about hyperons.

CO 9: This gives the study of quark model and multiplets and theories of fundamental interactions

Course: Electronics-I

CO1: Understand basic construction, equivalent circuits and characteristics of basic electronicsdevices.

CO2: Develop the Ability to understand the design and working of BJT / FET amplifiers.

CO3: Observe the effect of negative feedback on different parameters of an Amplifier anddifferent types of negative feedback topologies.

CO4: Observe the effect of positive feedback and able to design and working of different Oscillators using Transistors

CO5: Understand the operation and design of multistage amplifier for a given specification.

CO6: Understand number representation and conversion between different representation in digital electronic circuits

CO7: Formulate and employ a Karnaugh Map to reduce Boolean expressions and logiccircuits to their simplest forms.

CO8: Acquire knowledge on basic digital electronic gates

CO9: Develop knowledge on design trade-offs in various digital electronic families with a view towards reduced power consumption

CO10: Design and Analyse various combinational and Sequential logic circuits.

CO11: Learn about Counters and Shift Registers

Semester II

Course: Mathematical Methods of Physics– II

CO1: To analyze the exponential orders functions, Laplace transform, Inverse Laplace transformsand its properties.

CO2: Use of Laplace transforms for the solution of differential equations.

CO3: Distinguish the Hermite polynomials, Rodrigue's formula and solution of Hermite differential equation.

CO4: Analyze the different series (Fourier, Sine and cosine series).

CO5: Examine the Fourier integral theorem, Fourier transform and Parseveall's identity forFourier series and transforms.

CO6: To analyze the Laguerre differential equation, solution and their properties.

CO7: Study of the D'Alembert and Fourier series solutions, Vibrations of a freely hanging chain and rectangular membrane.

CO8: Compare the discrete groups, Permutation groups, Lie group and group postulates.

Course: Advanced Classical Mechanics and Electrodynamics

CO 1: This subject extrapolates the knowledge about Hamilton-Jacoby theory which includes Hamilton-Jacobi equations for Hamilton principal and characteristic functions.
Problems: Harmonic oscillator using Hamilton-Jacobi formulation and through action-angle variables

CO2: Student will study Special theory of relativity which helps to apply the space time correlation.

CO3: The students will study covariant formulation of four spaces and representation of various vectors in four-space and will study how it apply on covariant formulation of Force, momentum and energy equation in Minkowski space. By this students will able to solve the Applications of relativistic formulation in the study of motion under constant force and relativistic one dimensional harmonic oscillator.

CO4: This subject describes Small oscillations which include Formulation of problem, Eigen value equation, Frequencies of free vibration and normal modes. By this students apply this to solve the problem Normal mode frequencies and eigen vectors of diatomic and linear tri-atomic molecule

CO5: The students will study Continuous systems and fields. By this students will able to examine the CO concept Stress-energy tensor and conservation laws, Hamiltonian formulation

CO6: This subject provides information about Maxwell inhomogeneous equations and conservation laws

CO7: Student will study Electromagnetic waves and wave propagation. By this students will able to recognize the concept of Electric and Magnetic field.

CO8: Student will study the Polarization concept by this they will understand the concept of reflection of light and use this knowledge how Waves in a conducting medium and skin depth.

Course: Quantum Mechanics

CO 1: Solution of the Schrodinger equation for the hydrogen atom that used for solve to finding the Eigen value also find the Spherical harmonics, Radial solutions

CO 2: Interpret of Rigid rotator for hydrogen atom that understands the behavior of a particle in free and fixed state.

CO 3: Solution for three dimensional square well potential to Generalize the important properties of tunneling effect and Study of Linear vector spaces to understand the analysis ability

CO 4: Study of Hermitian, unitary and projection operators and commentators to conclude how the wave function changed when operator operated on wave function.

CO 5: Study the Change of basis-Representation theory to examine the different representations of wave function

CO 6: Study Generalized uncertainty principle to examine the position and momentum of particle.

CO 7: Study Density matrix. Schrodinger, Heisenberg and interaction pictures to test the knowledge of time dependant and time independent wave functions and wave operators.

CO 8: Study the Symmetry and conservation laws to generalize the principle of conservation in space and wave function.

CO 9: Examine the Solution of Simple harmonic oscillator and its properties in three dimensional.

CO 10: Matrix mechanical treatment of linear harmonic oscillator and its representations and solution in terms of matrix to examine the concept of energy Eigen values.

CO 11: Interpret creation and annihilation operators to understand how to increase or decrease in wave function.

CO 12: Interpret Matrix representations of J2,J-z, J+,J-; to understand the concept of spin of particle.

CO 13: Analyze Clebsch-Gordon coefficients and their properties and how to find the solution

CO 14: Addition of spin and orbital momentum to conclude the different concept of momentum.

CO 15: Determination of C.G. coefficients for ½+1/2 and ½+1 and Wigner-Eckart theorem to understand the addition of coefficients.

Course: Statistical Mechanics

CO 1: Students will get an idea for the macroscopic and microscopic states so that they will able to examine the connection between statistics and thermodynamics

CO 2: Students will analyze the methods of Ensemble and their representation.

CO 3: They will learn about Phase space so that they conclude the Liouville's theorem

CO 4: Students will analyze about the various methods of Micro canonical ensemble, Gibb's micro canonical distribution

CO 5: Students will test methods for Entropy of an ideal gas, Gibb's paradox, Sackur-Tetrode equation to conclude the concept of Entropy.

CO 6: Students will study methods to find the Partition function in phase space and how it willbe helpful to evaluate on canonical ensembles

CO 7: Students will study about Grand canonical ensemble and its thermodynamics anapply it on Energy and Density fluctuations

CO 8: Generalize the Postulates of Quantum Statistical Mechanics and Density matrix

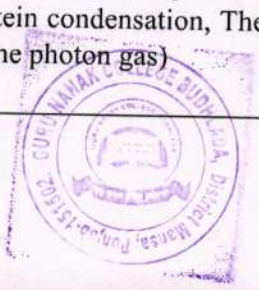
CO 9: Students will study Different ensembles in quantum statistical mechanics for different Ideal gases and apply it on ideal Fermi Gas, Ideal Bose Gas and Boltzman Gas

CO 10: Distribution functions for different ideal gases and density of states for an ideal gas.

CO 11: Equation of state of an Ideal Fermi Gas and Degeneracy and analyze what is the Fermi energy at T=0 and at low temperatures

CO 12: Thermodynamics of an ideal Fermi gas and free electron gas in metal

CO 13: Student will study about Bose Gas so that they extrapolate the concept of Equation of state of an Ideal Bose gas, Bose-Einstein condensation, Thermodynamics of an Ideal Bose gas and Black body radiation (The photon gas)



CO 14: Students will study about Phase transition so that they will able to interpret first and second order phase transition: the Clausius Claperyon equation

CO 15: Students will study the Ising model in zeroth approximation, random walk and brownian motion and how it apply on Fick's diffusion formula, Fick law and Einstein relation.

Course: Electronics – II

CO1: Compare the tuned primary and secondary circuits and how they are helpful in making amplifiers.

CO2: Differentiate between various power amplifiers (Class A, Class B and theirPush pull configurations).

CO3: Analyze the need of Modulation and generation of AM, FM and SSB.

CO4: To study the operational amplifier, its classification and lay out of practical operationalamplifiers

CO5: To study DC and AC characteristics of op-amp and how CMRR is calculate.

CO6: Demonstrate the various applications of op-amp (Adder, subtractor, Instrumentationamplifier, Log, antilog amplifier, Differentiator and integrator).

CO7: Distinguish the Square wave, Triangular wave and Sine wave generator.

CO8: To study the use of regulator and design of series regulator, IC regulators and 723 general purpose regulator.

CO9: To study about 555 timer circuit and compare its monostable and astable mode.

Semester III

Course: Condensed Matter Physics-I

CO1: Study of Bragg's Law of Diffraction to examine the interplaner spacing (d-spacing) of acrystal that used for identification and characterization purposes.

CO2: Determination of Reciprocal lattice and study of Brillion Zones to understand the important properties and behavior of the various crystal systems.

CO3: Analyze of structure factor and form factor which is a mathematical description of how a material scatters incident radiation.

CO4: Study of lattice vibrations of mono-atomic and diatomic linear lattices to examinethe role of Phonon in many of the physical properties of solids, such as the thermal conductivity and theelectrical conductivity.

CO5: Study of free electron gas model in one dimension and three dimensions to interpret thebehavior ofcharge carriers in a metallic solid.

CO6: Use of the static properties of metals that are useful in various technological applications.

CO7: Study of the transport properties of metals such as Sommerfeld theory, Hall Effect and thermal conductivity.

CO8: Study of the synthesis, types and properties and classify various types of nano materials which offers the potential for new and faster kinds of computers, more efficient power sources and life-saving medical treatments.

CO9: Study of the various optical properties of crystals to determination the phenomenon ofinteraction of light with these materials.

CO10: Have knowledge about the physics of semiconductor materials.

CO11: Analyze the characteristics and theories in semiconductor materials in terms of crystal structures, charge carriers and energy bands.

CO12: Describe band structures of semiconductors.

CO13: Demonstrate the physical characteristics such as electronic structure and optical and transport properties, and current-voltage characteristics of semiconductors.

CO14: Explain how to find the Fermi energy level and carrier density in n-type and p-type semiconductors.

Course: Nuclear Physics

CO1. In this students will analyze the nuclear properties like nuclear radius, mass and abundance of nuclides, binding energy and semi-empirical formula and relation between angular momentum and parity. Also the methods of calculating such properties.

CO2. The students learn about the spin and orbital contribution to magnetic moment andmethods of measuring these terms.

CO3. This tells about the properties of nuclear force and use of various models that tells about theinteraction between nucleons.

CO4. In this students will study the various models that examine the detailed informationabout the nuclear structure.

CO5. The course is such designed to teach students about various types of nuclear reactions and classify their energetic.

CO6. Students will learn about the neutron sources and detectors and also the methods ofslowing down the neutrons.

CO7. This discusses the various types of nuclear reactions and their properties.

CO8. Students analyze various methods of accelerating various types of particles to perform scattering experiments.

Course: Advanced Quantum Mechanics

CO1:- Understand Indistinguishability principle, Symmetry and antisymmetry of wave functions, Exchange operators,

CO2: Develop the Ability to solve Scattering problems of identical particles. Example to solve the: Hydrogen molecule, Spin statistic theorem, Slater determinant

CO3: Obtained the solution of wave function like Rayleigh Ritz variational method for ground & excited States, for example:- Ground state energy of hydrogen, helium and harmonic oscillator,

CO4: To solve the problems of Time Independent Perturbation Theory. First order and second order perturbation theory for non degenerate case; Problems: Anharmonic oscillator, He-atom; Degenerate perturbation theory, Problems: Stark effect, Zeeman effect.

CO5: To solve the problems of Transition probability for constant and harmonic perturbation, Golden rule, Induced absorption and emission, Einstein coefficients;Problems: Radiative transitions.

CO6: Understand WKB Method for solve the problems of potentialbarrier

CO7: Formulate and implement of Collision Theory

CO8: Acquire knowledge on Partial wave analysis

CO9: Develop knowledge on different solutions related to Relativistic Quantum Mechanics:

Course: Computer Simulation in Physics

CO1: Students will get an idea for the Evaluation of polynomials and Root finding:Evaluation of truncated series: Fundamental iterative scheme.

CO2: Students will use the methods to find Solution of nonlinear equations (Newton-Raphson method, Secant method, Newton method for two dimensions).

CO3: They will solve Iterative methods for systems of Linear equations (Jacobi method,Gauss Seidal Iteration.)

CO4: Students will differentiate about Interpolation and Approximation.

CO5: Students will analyse methods for Linear and nonlinear curve fitting: Least squares approximation, Data linearization, and Piecewise and Cubic Spline interpolation.

CO6: Students will use mathematical tools like Differentiation and Integration using forward, backward and central difference operators; Error analysis, Trapezoidal and Simpson rules;two and three dimensional integration for various problems

CO7: Students will study methods to solve solutions of Ordinary Differential equation (Taylormethod, Runge-Kutta method and Predictor-Corrector method).

CO8: Students will study about Pseudo random numbers and their generation, Monte-Carlointegration.

CO9: They will examine Simulation of Physics Problems and Algorithm development.

Semester: IV

Course: Condensed Matter Physics-I

CO 1: Analyze various properties of different types of magnetic materials.

CO 2: Compare the behavior of Magnetization at absolute zero and its temperature dependence.

CO 3: Differentiate Hard and soft magnetic materials.

CO 4: Determine magnetic resonance and dielectric absorption of ferroelectric materials

CO 5: Examine traditional and high Tc superconductors, Meissner effect, Heat capacity, Energygap and Isotope effect.

CO 6: Extrapolate the knowledge about basic ideas of BCS theory.

CO 7: Analyze macroscopic quantum interference, SQUIDS and its applications.

CO 8: Differentiate Plasmons, polaritons, polarons and Lattice defects

Course: Advanced Electronics

CO 1: To study the need of Analog to digital and digital to analog converter.

CO 2:-Discuss various methods of generation of (A to D) and (D to A) signal and evaluatetheir performance.

CO 3: To study the use of Micro-Processor in daily life and block diagram of 8085microprocessor.

CO 4: To categories the various memory in term of RAM and ROM and compare (BipolarROM, MOS, ROM, Static RAM, Dynamic RAM).

CO 5: To study the interfacing concept and demonstrate the interfacing of Input device, output devices and Memory segment with 8085.

CO 6: To classify various types of instructions (Data transfer, Arithmetic, Logic, Branch, Rotote and compare) and their format in 8085.

CO 7: To study the Looping, Counting; and indexing concept and differentiate higher bit addition and data transfer instruction from lower bit instruction.

CO 8: To study about the Stack, Subroutine, conditional Call and Return Instructionsof 8085.

CO 9: Classify various higher bits processors.

Course: Radiation Physics

CO1: Demonstrate knowledge of fundamental aspects of Energy distribution of thermal neutrons, Effective cross section of thermal neutron and slowing down of reactor neutrons.

CO2: Calculate transport mean free path and scattering cross-section and Slowing down time, Resonanceescape probability

CO3: Examine Neutron cycle and multiplication factor Neutron leakage and critical size, Nuclear reactors and their classification

CO4: Evaluate thermal Neutron diffusion, Neutron diffusion equation, Thermal diffusion length, Exponential pile, Diffusion length of a fuel-moderator mixture, Fast neutron diffusion and Fermiage equation, Correction for neutron capture

CO5: Analyze nuclear spectrometric data, Measurements of nuclear energy levels, spins, parities and moments

CO6: Calculation of g-factors and hyperfine fields.

CO7: Categorize experimental techniques used (or developed) for nuclear physics purposes and discuss their influence on development of new technologies

CO8: Apply radiation physics applications in medical diagnostics and therapy, energetic, geology, archaeology.

Course: Electronics Communication System

CO1: What is the use of modulation during communication and various types of Noisepresent during transmission.

CO2: To study the AM, its frequency spectrum and calculate its power relations. Design of AM generation and receiver circuit.

CO3: To study various generation and receiver circuit of (SSB, DSBSC, Pilot carrier, ISB andVSB) and compare their output

CO4: To study the use of FM and evaluate its mathematical representation and frequencyspectrum.

CO5: Demonstrate the transmission and receiver circuit of FM.

CO6: To study the basic principle of Radar and compare different Radar system (Pulsed radar,Moving target indication, CW Doppler radar, frequency modulated CW radar and phasedarray radars.

CO7: To study about various pulse communication modulation and compare the (Pulse amplitude modulation (PAM), pulse width modulation (PWM), pulse position modulation (PPM) and pulse code modulation (PCM).

CO8: Differentiate between Frequency division multiplexing and Time division multiplexing and design of different Communication link system (Fiber optics, microwave, tropospheric and, submarine cables.

CO9: Demonstrate the Frequency modulated microwave radio system and examine path details and system gain

CO10: Study of optical fibers, optical sources, light detectors and their classification. Calculate losses occur in optical fiber cables.

GURU NANAK COLLEGE BUDHLADA, District Mansa, Punjab-151502

Head
Deptt. Of Science
Guru Nanak College
Budhlada (Mansa)

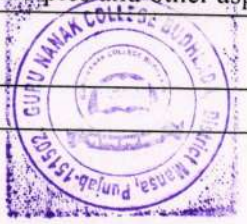
Department of Library and information Science

Program Outcome

Sr.No.	Programme	Outcome of Program
1.	B.Lib.I.Sc.	The Program B.Lib. I. Sc. Focuses on skill development of Library & Information Science students for selecting, acquiring, organizing, processing, storing and dissemination of information. It also enhances the competencies for managing libraries and information centers by applying the principles of librarianship and professional ethics.
2.	M.Lib.I.Sc.	The M.Lib.I.Sc. Course has been designed to produce the competent, skilled and dynamic Library Professionals to meet the challenges on the changing scenario of Libraries & Librarianship. A part from that the students will be capable to Manage the Library & Information Centres in best possible way. Moreover after completion the course the students may join as researcher after clearing UGC-Net/JRF and also join the teaching profession. The Students will serve in academic, public, special and national Libraries in the following capacities: Librarian Deputy Librarian Assistant Librarian Information Scientist Knowledge Manager

Course Outcome of B.Lib.I.Sc.

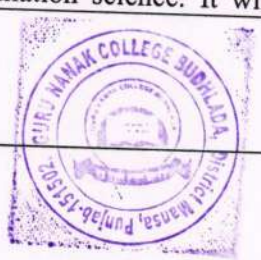
LIS101	Foundations of Library and Information Science
This paper enhances the knowledge of students about the basics of Library & Information Science. Moreover, the students will be able to understand the different categories of libraries & Information centres.	
LIS102	**Knowledge Organization and Information Processing: Theory**
This paper focuses on the theoretical aspects of Library classification and cataloguing. It will help the students to understand the various principles and other aspects of library classification and cataloguing.	



LIS103	Knowledge Organization and Information Processing: Classification Practice CC&DDC
This paper develops practical skills in classification with both schemes colon classification & Dewey Decimal Classification. It enhances the skill of students for organizing the knowledge in best way.	
LIS104	**Knowledge Organization and Information Processing: Cataloguing Practice CCC&AACR II**
This paper develops the cataloguing skills of students for developing effective OPAC & Web-OPAC. Moreover, students can join as knowledge manager in different institutions.	
LIS105	**Management of Libraries and Information Centres**
This paper develops the managerial skills in students .They will become efficient information and knowledge managers in different type of academic, Public, Special and National Libraries.	
LIS106	**Information Sources and Services**
This paper develops the skill about information sources and services among students. They will be capable to provide the different type of information sources & services to the library users.	
LIS107	**Information and Communication Technology**
Information & Communication Technology is an integral part of library & Information science. It develops the technical skills among library science students for library automation, networking and resource sharing at different levels.	
LIS109	**Library and its Users**
To enhances the use of library resources and services and create the awareness among students about library resources and services, this paper has been designed. Even, the students will understand the different categories of library users and their information needs.	

Course Outcome of M.Lib.I.Sc.

LIS201	Information, Communication and Society
Nowadays we are lining in information society. Every person of society needs information for various purposes. This paper will help to students to understand the various aspects of information and knowledge management. Even they will be capable to understand the concept of information science and also will help to become efficient information scientists.	
LIS202	**Information Storage and Retrieval**
This paper develops the skills of information storage and consolidation among the library science students. They will be capable to provide authentic and consolidated information to the different categories of users as per their information needs.	
LIS203	**Research Methodology in LIS**
This paper will develop the research skills among the library science students. They can do research in different aspects of library and information science. It will help to understand the various tools and	



techniques of research.	
LIS204	**College and University Library System**
This paper helps to understand the College and University library system. The students understand the various commissions and committees of library and information science. Even they will develop the skills of library planning and financial management of library and information centres.	
LIS207	**E-Resources in Library and Information Centres**
Nowadays libraries are providing both electronic and print information resources. This paper will enhance the knowledge and skills among library & information science students about the electronic resources and their management.	
LIS208	**Information Analysis, Consolidation and Repackaging**
Information Analysis, Consolidation and Repackaging develops the competencies among library science students about the analysis, consolidation and repackaging of information. Moreover the students will be able to understand the authenticity of information and they will provide the right information to right user at right time.	
LIS209	**Advanced Knowledge Organization:** **(a) Classification Practice*** **(b) Cataloguing Practice***
Advances knowledge organization develops the advanced classification and cataloguing skills among library science students. It develops competencies to organize the information documents and other materials in library and information centres.	
LIS210	**Information and Literature Survey in Social Sciences**
This paper enables the students to understand the various subjects of social sciences. It also helps to identify the different kind of information resources and services in social sciences .Moreover, the students will understand the evaluation criteria and different type of databases available for social scientists.	

Head
Dept. of Library & Information Science
Guru Nanak College, Budhlada (Mansa)

GURU NANAK COLLEGE BUDHLADA, District Mansa, Punjab-151502

Department of Mathematics

M.Sc.Mathematics

Programme Outcomes

The M.Sc. Mathematics programme aims to prepare students with a deep understanding of mathematical concepts, research oriented attitude and skill of application of mathematical and computational tools and techniques in formulation and solution of real world problem.

COURSE Outcomes

MM 401: ALGEBRA - I

- Apply the Internal Direct Product Theorem in simple cases
- Decide whether a given group is cyclic, and given a finite cyclic group, find a generator for a subgroup of a given order
- 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
- Express products of elements of a group defined by generators and relations in appropriate standard form
- Recognize the dihedral and dicyclic groups when described using a standard form

MM 402: MATHEMATICAL ANALYSIS

- To get intuitive idea about linear transformations
- Get the idea of measureable set and integration with geometric interpretation
- To write the function in implicit form using implicit function theorem
- Deep study of convergence of integrals

MM 403: TOPOLOGY I

- To get the idea of countability and uncountability of sets
- Study of topological spaces and their various properties
- Recognize metric spaces geometrically
- Study the compactness and connected properties of topological space

MM 404: Differential Geometry

- To get introduced to the concept of a regular parameterized curve
- To Understand the concept of curvature of a space curve and signed curvature
- To be able to understand the fundamental theorem for plane curves.
- To get introduced to the notion of Serret-Frenet frame for space curves
- To study involutes and evolutes of space curves with the help of examples.
- To be able to understand the fundamental theorem for space curves

CS-405 A: Introduction to Computer Programming using C

- To learn the fundamental programming concepts and methodologies which are essential to building good C/C++ programs.
- To practice the fundamental programming methodologies in the C/C++ programming language via laboratory experiences. Microsoft Visual Studio is the programming environment that will be used.
- To code, document, test, and implement a well-structured, robust computer program using the C/C++ programming language.
- To write reusable modules (collections of functions)

MM 501: ALGEBRA-II (RINGS AND MODULES)

- To know the definitions of and understand the key concepts introduced in this module.
- To understand and be able to use the main results and proofs of this course.
- To be able to investigate the properties of a ring or module.
- To relate the concept of an ideal to homomorphisms and factor rings.
- To distinguish between the concepts of primeness and irreducibility.

MM 502: TOPOLOGY II

- To get to introduct to higher separation axioms
- To analyse products of different types of topological spaces
- To learn about filters and filterbase, convergence and clustering
- To get the idea about categories and functors

MM 503: DIFFERENTIAL EQUATIONS-I

- Solve first-order ordinary differential equations
- Find solution of higer-order linear differential equations
- Solve systems of linear differential equations
- Solve the linear systems in normal form

MM 504: COMPLEX ANALYSIS

- Define the concept of analytical function
- Study Cauchy's integral formula and about entire functions
- Study the poles and other singularities of the function
- To calculate the residue of rational functions

CS 505(A): Object Oriented Programming Using C++

- To describe the advantages of a high level language like C/C++, the programming process, and the compilation process
- To describe and use software tools in the programming process
- To design, implement, debug and test programs using the fundamental elements of C/C++

MM601: DIFFERENTIAL MANIFOLDS

- To study differential manifolds
- To introduce the concept of Riemann Manifolds having wide applications in various fields of Mathematics
- To understand torsion tensors and curvature

MM 602: FIELD THEORY

- To study field extensions
- To understand about normal and separable extensions
- To understand about insolvability of polynomials of higher degree

MM 603: DIFFERENTIAL EQUATIONS II

- To study differential equations started in previous semester
- To introduce more advanced techniques like Green's function and symmetry methods

MM606: COMPLEX ANALYSIS II

- To introduce more advanced techniques like Green's function and symmetry methods
- To study MittagLefflers expansion
- To analyse Monodromy theorem and Harmonic methods

MM609: OPTIMIZATION TECHNIQUES I

- To various types of programmings to obtain optimal solution
- To solve transportation and assignment problems
- To understand the strategy applied in game theory

MM 702: THEORY OF LINEAR OPERATORS

- To introduce the spectral techniques
- To study bounded linear operators
- To study operators in Hilbert space

MM 709: ALGEBRAIC CODING THEORY

- To understand the concept of error detection and error correction codes
- To introduce the application of finite field methods to the problem of coding theory
- To study simplex codes and related bounds

MM 710: COMMUTATIVE ALGEBRA

- To introduce the techniques of commutative algebra
- To discuss the behavior of prime ideals under localization

MM 716: MATHEMATICAL METHODS

- To solve integral equations
- To study variation methods

MM 717: ANALYTICAL NUMBER THEORY

- To develop the understanding of arithmetical functions
- To study the use of generating functions as an essential tool for additive theory of numbers
- To apply these concepts and techniques in various applications

Head
Department of Mathematics
Guru Nanak College, Budhlada

GURU NANAK COLLEGE BUDHLADA, District Mansa, Punjab-151502

Department of History

M.A. History

Program outcomes

History is a great domain to pursue and gradually it is becoming quite a popular subject. A degree in history, backed by some specialization at Master's level, will open up a lot of avenues for you. History subject has lots of career options after graduation and Masters in History. Degree in history provides you with a set of transferable skills that are applicable to a wide range of careers such as law, publishing, journalism and the media, teaching, advertising, work in the development sector Global Charity work etc. In Government organizations, a number of people choose history as a subject at the graduation level in order to have an edge in the public service commission examinations. Graduation with honors in history paves you way to different government jobs such as SSC, UPSC, or IBPS etc. after clearing their respective examinations.

Course outcomes

History of Punjab (1469-1675)

- To understand the various concepts regarding Sikhism Institutions of guru's period.
- To provide information regarding Sikh religion and social development in queuing period.
- To enhance the knowledge of learner about Punjab history.
- The students will be able to give basic information about the work and teachings of 9th Sikh Masters.

History of the world (1500-1815)

- To enhance the knowledge of learning about the basic ground of world history.
- The students will be able to trace the development and dispersal of religion.
- The students will be able to identify the achievements in art, architecture, literature and philosophy and assess their impact on Society of world history.
- The students will be able to describe the development and explain the significance of distinctive forms of political, social and economic organizations of this period.
- To provide information of Renaissance era of Europe.

History of the world (1871 – 1919)

- The students will be able to identify major discoveries, inventions and scientific achievements and assess and their impact on Society of this period.
- The students will be able to assess the significance of key turning points in world history.
- To provide information regarding background of political revolutions.
- To understand the causes of effects of social reforms.

Theory and research methodology

- Students understand the basic skills of history writings and research
- The students will be able to understand the depth of subject theory and research methodology
- Students got exposure and understanding of different historical aspects that have become debatable among historians

- This subject made students understand and see in detail the analytical thinking in process of reconstruction of history

History of Punjab from (1675 -7019)

- To enhance the knowledge of the learner about the history of Punjab
- To provide information regarding political, economic, social and religious issue of this period
- Students will acquaint the pupils with major ideas and thoughts of the Sikh religion development during this period
- To provide information regarding Sikh struggle against the Mughals during this period

History of the word (1815- 1870)

- To enhance the knowledge of the students about world history
- The student able to understand world history and its impact on India
- To understand the meaning of nationalism and their respect towards great international personality
- Students have understood the process of colonialism in different parts of world

History of the world (1919 – 1991)

- Students gain knowledge about political history of modern world
- Students will be able to explain the various political movements and growth of nationalism in different parts of the world
- Students trace and analyze the main development of contemporary word and explored the important developments of 20th century word
- Students have understood the necessity of universal brotherhood

Theory and research methodology

- The students will be able to go exposure to difference in perspective and understanding of European and Indian historians
- The students understood different aspects and data that are used to re-construct history and now this has made certain topic that are debatable
- Students have understood the concept of historiography and its different perspectives
- Students got exposure to research methodology and presentation

History of Punjab from (1799- 1849)

- The course AIMS at acquainting students with history of Punjab during the period of Maharaja Ranjit Singh
- The students will understand the history of Punjab from the foundation of the first Sikh Empire in 1799
- Students will understand effects on Punjab after the death of Ranjit Singh

History of India from (1707 -1772)

- The students will be able to understand the social, economic, cultural and political background of modern India
- Students will be able to understand the key concept related to history of India

- Students can learn about foundation and expansion of Colonial rule in India
- Students aware about the historiography on the decline of the Mughal Empire
- Students will be able to explain how the company's rule in India was established after the Battle of Plassy and legitimized the regulating act, socio-religious reforms movements and educational reforms

History of India from (1818-1947)

- The students will be able to evaluate consolidation of English power in India
- The students will be able to describe the revenue systems under the company's rule in India
- The students will be able to trace the British colonial expansion in the political context of 18th century in India
- They will learn about the change in society, political, religion and economy during this period
- The students will be able to acquire knowledge about the freedom struggle

National movements in India and constitutional development (1858- 1930)

- The students will be able to explain Indian nationalism and freedom struggle
- The students will be able to understand the core ideas of national movements in its conceptuality
- The students will learn about the constitutional development during British rule
- Students have understood the process of healthy nationalism and secularism by struggling work of social reformer and freedom fighters

History of Punjab from (1849 -1947)

- The students will understand to Punjab's contribution in the freedom struggle
- Students will understand the history of Punjab to the formation of new Punjab in 1966
- The students will be able to provide information regarding background of partition of Punjab

History of India (1772 -1818)

- The students will be able to provide information regarding background of British rule
- To understand economic development in this period
- To enhance the knowledge of learner about History of India
- To understand the various concept of this period

Social and economic history of modern India (1818 -1947)

- Students able to understand of various terms, key concept related to economic and social history of India
- They develop ability of critical and logical thinking of Indian society
- The students will be able to develop and Awareness of the diversity and complexity of human social, cultural, political and economic Institutions of history of India
- The students will be able to learn The Legacy of British rule in India

National Movement in India and constitutional development (1930-1947)

- Students develop the knowledge and understanding of ideas of leaders and movements during National Movement
- Students will be able to reflect upon choices humans have made in the past and consider how choices made today very affect the future
- Highlight the significance of Government of India Act of 1935 and independent act 1947
- Learn the contribution of Indian freedom fighters

Head
Deptt. Of History
Guru Nanak College
Budhlada (Mansa)

GURU NANAK COLLEGE BUDHLADA, DISTT. MANSA, Punjab-151502

Department of Political Science

M.A. Political Science

PROGRAMME OUTCOME

The Department of Political Science is dedicated to promote teaching and research in diverse fields of Political Science including Indian Politics, Comparative Politics, and International Relations while maintaining conventional fields like Political theory. The Learning Outcomes are as Follows:

1. To develop comprehensive knowledge of the subject by teaching both conventional and new areas , relevance in the domain of Indian Politics, Comparative Politics, International Relations, Public Administration etc
2. To develop comprehensive and inter-disciplinary knowledge by emphasizing inter linkage between various Political, social issues and challenges.
3. To generate socially- informed knowledge and cater to the education upliftment and marginalized community.
4. To develop theoretically rich and grounded knowledge to motivate and inform students about the opportunities and future prospective in the field.

COURSE OUTCOME

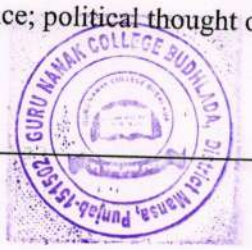
M.A Ist Year Sem- I

Paper – I INDIAN POLITICAL THOUGHT

1. Tracing the evolution of Indian political thought from ancient India to modern India.
2. Helping the students in enhancing knowledge in the field of Indian Political thought in the initial stage of their study.
3. Apprising the students about India' contribution towards the enrichment of the field of political thought.
4. Gathering knowledge regarding India's orientation towards politics and apprising the students about the growth of modern democratic political consciousness in India.
5. Helping the students in their future course of study in India's political thought.

Paper -II WESTERN POLITICAL THOUGHT

1. Providing an insight into the dominant features of Ancient Western Political Thought: Ancient Greek political thought with focus on Aristotle and Plato; Roman Political Thought: its contributions with special emphasis on the emergence of Roman law.
2. Examining the features of Medieval Political Thought with focus on Thomas Aquinas and Augustine.
3. Evaluating the Renaissance; political thought of Reformation; and Machiavelli.



Paper- III INDIAN GOVERNMENT AND POLITICS

1. Introducing the Indian Constitution with a focus on the role of the Constituent Assembly and examining the essence of the Preamble.
2. Examining the Fundamental Rights and Duties of Indian citizens with a study of the significance and status of Directive Principles.
3. Assessing the nature of Indian Federalism with focus on Union-State Relations.

Paper- IV INTERNATIONAL RELATIONS

1. Explaining scope and subject matter of International Relations as an autonomous academic discipline.
2. Approaches and methods to study the discipline through Political realism, Pluralism and Worlds system's Mode
3. Examining the issues of Underdevelopment, Terrorism, Regionalism and Integration that characterizes the Post Second World War order.
4. Explaining certain basic concepts like Globalisation in contemporary world order.
5. Studying the developments in third world countries in post world war II era like NAM: Relevance, ASEAN, SAFTA and SAARC, OPEC, OAU, West Asia-Palestine problem after Cold War.

SEM- II

Paper –I Modern Indian Political Thought

1. Tracing the evolution of Indian political thought from ancient India to modern India.
2. Helping the students in accruing knowledge in the field of Indian Political thought in the initial stage of their study.
3. Apprising the students about India' contribution towards the enrichment of the field of political thought.
4. Gathering knowledge regarding India's orientation towards politics and apprising the students about the growth of modern democratic political consciousness in India.
5. Helping the students in their future course of study in India's political thought.

Paper –II Contemporary Issues in Global Politics

1. With a focus on politics at the transnational or global level, it demonstrates a generalized understanding of the diplomatic relationship between nation- states, the functioning of international organizations, international law and economy, disarmament and peace efforts, foreign policies of states, the behaviour and roles of nation-states in diverse political situationsand also help gain an insight into subjects of Human Rights law and theory.

2. Understand the major concepts of international relations, including: power, the international system, balance of power, hegemony, conflict, cooperation, integration, globalization, interdependence, dependence, regimes, globalization, equality, justice, sustainability and international political economy.

3. Understanding and critically evaluating the theories and approaches to international relations, including realism, liberalism, classical and neo-Marxism, Neo-Gramscian, critical, postmodernist, post-colonial, sexuality and feminist.

4. Identify the key actors in international relations—including states, intergovernmental organizations, non-governmental organizations, transnational corporations, global civil society, and individuals—and understand how these actors interact to give substance to international relations.

Paper –III Liberal Political Theory

1. To understand the nature and scope of political theory

2. To understand the significance of political theory.

3. To acquaint with the theories, approaches, concepts and principles of political theory.

4. To appreciate the procedure of different theoretical ideas in political theory.

5. To Interpret and assess information regarding a variety of political theory.

6. To understand the various traditional and modern theories of political

science.

7. To evaluate the theories of origin of the state.
8. To comprehend the sources of political

Paper –IV Democracy in India

1. To understand the significance of democracy
2. To understand the difference between parliamentary and presidential system of India
3. To understand various theories of democracy and critically examine them.

M.A IInd Year

SEM –III

Paper –I Contemporary Political Thought

Understand several theories of Indian political thought

1. Analyze the evolution and nature of Indian state and its principles
2. Discuss and debate about the theories pertaining to modern India through its evolution.
3. Identify the role Indian political thought and their contribution in shaping the contemporary idea of India.
4. helps in understanding views of contemporary thinkers like karl marx, Friedman , Marcuse etc

Paper –II Modern Political Analysis

1. Identify the historical origin of various states.
2. Discern and comprehend the concept and theories of State and its various features
3. Study the comparison between Traditional and Modern Approaches of Political System.

Paper – III Political Parties and Pressure Groups of India

1. Discuss about the party system in India and impact of coalitional politics on the party system.
2. Understand the changing nature of national party and the regional parties.
3. Analyze the role of gender, caste, religion etc on the voting behavior in particular and on electoral politics in general.
4. Identify the impact of several non-party movements and Non-governmental Organizations on the party system in India.

Paper – IV Foreign Policy of India

1. An understanding of the fundamentals of foreign policy-making in India;
2. An understanding of the foreign policy challenges facing India;
3. A developed capacity to present strong arguments in their written and oral work and to deploy relevant key facts, concepts and theories.

Sem- IV

Paper- I Theory and Practice of Public Administration

Demonstrate broad understanding of public affairs, policy development, policy analysis, economic analysis, management skills, and organization theory and their applications to public service.

1. Conduct a purposeful inquiry exploring the problem/issue a client is experiencing.
2. Apply critical thinking and appropriate technology for public policy analysis.
3. Work with and for others in ways that translate community need into policy solutions & public service action to promote a just and humane world.
4. The working of local self-governments in our political system.

Paper –II Comparative Politics

1. Helping the students in building their base in the study of comparative government.
2. Accruing knowledge about different forms of government found in different political systems in the world.
3. Students have stronger and more informed perspectives on approaches in studying politics, governments and political systems comparatively. They become familiar with the primary theories and concepts that form the building blocks of the subfields.

Paper- III Research Methodology

1. This paper trains the students to undertake research by familiarizing them with the basic and advance tools and techniques of field studies. So after competing it the students will be able to design research projects and programmes in diverse areas of political science.
2. This paper trains the students to undertake research by familiarizing them with the basic and advance tools and techniques of field studies. It would also familiarize them with the philosophical foundation of research methods in social sciences. Upon completion of this paper, students will be able to design research projects, conduct field investigations and carry out experimental plus qualitative research.
3. Understand and apply the knowledge about research design and methods gained from the taught components to develop the dissertation project.
4. Discuss the ethical dimensions of research and obtain appropriate ethical approval if needed
5. Synthesize knowledge and skills previously gained and apply these to an in-depth study.

Paper- IV Contemporary Debates in Political theory

1. To understand the concept of state, nation and civil society.
2. To understand contemporary ideologies likes liberalism, socialism, environmentalism etc
3. To know about various theories of feminism.
4. To analyse critically the theories of democracy.

GURU NANAK COLLEGE SUDHLADA Distt. Mansa, Punjab-151502

Head
Deptt. Of Pol. Sc.
Guru Nanak College
Budhlada

Department of Music

M.A. Music (Vocal)

Program Specific Outcomes:

PSO 1 Gain complete knowledge about scientific and fundamental aspects of Indian Classical Music

PSO 2 Understand the background history of Indian Music in ancient, medieval and modern periods.

PSO 3 Gather attention about principles and importance of Aesthetical Study of Hindustani Music and Raga and Tala: Their Physics and Aesthetics with particular reference to Music

PSO 4 Appreciate the Modern Trends in Classical Music as well as Traditional and Modern Systems of Teaching Music.

PSO 5 Gain practical knowledge with performance of Indian Classical forms of music like Khayal, Dhrupad, Dhamar with different layakaries, Light Classical forms like Thumri, Dadra, Tarana, Ghazal, Sufiana Qalam, Raga based Bhajan or Shabad in different Ragas as well as folk singing forms of Punjab.

PSO 6 Learn about 'on the spot composition' of the lyrics given by the examiner by playing Harmonium

PSO 7 Demonstration of different Taals on hand and on Tabla with different layakaries,PSO 8 Able to give stage performance and viva-voce of Ragas

Course Outcomes:

Semester-I

Paper I Scientific & Accoustical Study of Hindustani Music (Vocal).
Paper II History of Indian Music (Vocal)
Paper III Stage Performance
Paper IV Viva-Voce

CO-1 Students will know of fundamental of auditorium acoustic

CO-2 Students will understand the Vibration; Pitch; Intensity; Timbre.

CO-3 Students will get attention about development of different music scales.

CO-4 Students will learn the concept of Swar Sthapna on the string of veena as described by scholars of medieval period.

CO-5 Students will know the importance of notation system in music education.

CO-6 Students will learn how to create of voice culture atmosphere and correct intonation of swaras in the context of Hindustani Music.

CO-7 Students will make detailed study of technical terms of music like avirbhav-tirobhav; alpatva-bahutav; kan ; meend; gamak; khatka; murki

CO-8 Students will get complete knowledge of development of Indian Music in various periods oh history

CO-9 Students will know about contribution of the following music scholars and musicians

CO-10 Students will Gather attention about analytical Study of Musical references mentioned in Shri Guru Granth Sahib

CO-11 Students will get information about contribution of Punjab in the field of Indian Classical Music

CO-12 Students will study the Historical Development of different Gayan shaillies on Indian Music

CO-13 Students will know the origin, development and characteristics of the different gharanas of Khayal Gayan

CO-14 Students will Gain Practical knowledge and performance of Raga of Khayal, Tarana, Folk Gayan of Punjab, playing Harmonium

CO-15 Students will also able to sing Dhrupad in any one raga prescribed in syllabus

CO-16 Students will learn a Bhajan or a Shabad in raga as prescribed in Sri Guru Granth Sahib while playing Harmonium

CO-17 Students will able to demonstrate the following talas on hand in Ekgun, Dugun and Chaugun Layakaries: Jhap Taal, Jhumra, Jat, Deepchandi and Roopak

CO-18 Students will able demonstrate the different taals on hand and table.

CO-19 Students will know the viva-voce of ragas Rageshri , Ahir Bhairav , Puriya Dhanashri, Bhimplasi, Alhaiya Bilawal , Bihag.

Semester-II

Paper I Scientific & Accoustical Study of Hindustani Music.

Paper II History of Indian Music .

Paper III Stage Performance .

Paper IV Viva-Voce .

CO-1 Students will clear the basis of accoustical terms like Frequency, Beats, Echo, Resonance, Overtones.

CO-2 Students will study of sound with particular reference to the study of studio recording techniques with special reference to composing, editing and mixing.

CO-3 Students will study of Moorchhna along with its relevance in modern times

CO-4 Students will know the comparative system of Hindustani and Karnatka styles of music with special reference to Swar, raag and taal system.

CO-5 Students will make detailed study of Shruti from Ancient to Modern Period

CO-6 Students will be cleared cycle of fourths & fifths in the context of Swar-Samvad

CO-7 Students will Study about the Melody & Harmony and its application in music.

CO-8 Students will learn the usage of Electronic gadgets in the presentation of music for public performances, their techniques and importance.

CO-9 Students will know the development of Indian music in the British Period and Post-independence Era.

CO-10 Students would be able to draw the life sketch and contribution of the scholars and musicians like Ustad Amir Khan, Ustad Bade Gulam Ali Khan, Prof. Tara Singh, Pandit Onkar Nath Thakaur, Acharya Brihaspati.

CO-11 Students will know the contribution of the royal patrons in the development of Indian Music like Allauddin Khilji, Maan Singh Tomar, Mohammad Shah Rangila, Wajid Ali Shah.

CO-12 Students will get information about historical development of the different Gayan shaillies like Khayal, Thumri, Tappa.

CO-13 Students will understand the Origin, development and characteristics of the gharanas of khyal gayan like Kirana, Jaipur, Rampur Sehaswan.

CO-14 Students will Study of Gharana Tradition in Punjab with particular reference to Patiala Gharana.

CO-15 Students will able to sing a Dhrupad in any one raga prescribed in paper IV exceptthe raga selected for the stage performance.

CO-16 Students will able to sing a raga based Bhajan or a Shabad in raga as prescribed inSri Guru Granth Sahib while playing Harmonium.

CO-17 Students will able how to demonstrate the talas, Jhap Taal, Jhumra, Jat, Deepchandi and Roopak on hand in Ekgun, Dugun and Chaugun Layakaries.

Semester-III

Paper I: Aesthetical Study of Hindustani Music
Paper II: Raga and Tala: Their Physics and Aesthetics
Paper III: Stage Performance
Paper IV: Viva-Voce

CO-1 Students will know the principles of Aesthetics with particular reference to Music.

CO-2 Students will make the relationship of Music with other Fine Arts.

CO-3 Students will learn Traditional and Modern Systems of Teaching Music.

CO-4 Students will get Importance of Audio Visual & Electronic Media in promotionand propagation of Music.

CO-5 Students will make essays on various forms of Light Music, Rabindra Sangeet,Impact of Globalization on Indian Music.

CO-6 Students will know the characteristics of Folk Music with particular reference toPunjab.

CO-7 Students will Study of the different forms of Punjabi folk music like Kwishri, Vaar Gayan, Lammi Hek Wale Geet.

CO-8 Students will know the definition, concept and characteristics of Raga.

CO-9 Students will make analytical Study of Ten Ashray Raags.

CO-10 Students will Study of the Jati system and its role in the evolution of Raag.

CO-11 Students will get information about Ancient and Medieval systems of Raag-classification Grama -Raag Classification,Dash-Vidh Raag Classification, Shudha- Chhayalag-Sankiran Raag Classification, Raag-Ragini Classification, Mela-Raag Classification.

CO-12 Students will know about Time Theory of Ragas, its importance and relevance in contemporary music scene with Particular study of Sandhi Prakash Raag, Adhava Darshak Swara, Parmel Parveshak Raag, Uttar Raag and Poorav Raag, Seasonal Raag.

CO-13 Students will know about Tala, its definition, concept, various elements and its importance in music.

CO-14 Students will Study the Laya and Layakaries and ability to write Teentaal, Ektaal, Jhaptaal, Rupak Taals in various layakaries.

CO-15 Students will able Perform a Vilambit Khayal and Drut Khayal, Dhamar with different layakaries,

CO-16 Students will able Perform a Ghazal/Sufiana Qalam while playing Harmonium.

CO-17 Students will able to demonstrate the Taals on Tabla with dugun layakari likeDhamar, Aada Chautaal, Sooltaal, Tilwara.

CO-18 Students will able to perform and make viva-voce of Ragas Mian Malhar, Jaunpuri, Jaijaiwanti, Kedar, Nat Bhairav, Puriya Kalyan.

Semester-IV

Paper I: Aesthetical Study of Hindustani Music

Paper II: Raga and Tala: Their Physics and Aesthetics

Paper III: Stage Performance

Paper IV: Viva-Voce

CO-1 Students will know about general idea of Aesthetics as described by the WesternScholars.

CO-2 Students will understands the concept of Rasa in Indian Music.

CO-3 Students will learn how to relate the Music with Religion & Philosophy.

CO-4 Students will know importance and Principles of Accompaniment in ClassicalMusic.

CO-5 Students will would get idea about modern trends in Classical Music.

CO-6 Students will predict the relationship of Folk Music & Classical Music.

CO-7 Students will make a detailed study of different folk forms of Sri Guru GranthSahib.

CO-8 Students will study of Folk Music of North West Region of India (Punjab, Haryana, Himachal, Jammu & Kashmir and Rajasthan.

CO-9 Students will understand aesthetical study of Ragas and various elements of Raga-Vistaar.

CO-10 Students will know concept of Raag-Dhyan.

CO-11, Students will Explore the new possibilities in Raag-classification system while doing critical,study of modern systems like Thaat Raag Classification, Raagang Padhati.

CO-12 Students will know the contribution of Punjab to Raga of Hindustani Music withspecial reference to Gurmat Sangeet and Punjabi Folk Music.

CO-13 Students will able to Distinction of Samprakirtik Raag.

CO-14 Students will know the Principles of Combination of Raag.

CO-15 Students will make Physical study of Tabla and its various styles (Baaj).

CO-16 Students will know the evolution and development of Percussion Instruments andtheir importance in Indian classical music.

CO-17 Students will able to performance Vilambit Khayal and Drut Khayal, A Thumri orDadra, On the spot composition of the lyrics given by the examiner.

CO-18 Students will able to demonstration of Taals on Tabla with Dugun layakaries like Punjabi Theka, Deepchandi, Basant, Pancham Swari.

CO-19 Students will able to perform and make viva-voce of Ragas Madhuwanti, Jog,Maru Bihag, Gaud Sarang, Bairagi, Marwa.

Department of Humanities

Public administration

Program outcome

Public administration provides students knowledge skills and aptitude needed to begin career in the public service sector and not for non profit sector. After the completion of the same student will develop a sound theoretical and practical understanding of the basic concept and theories of organized and function of public administration in diverse fields prepare and inculcate the requisite skills and aptitude imperative for to be a good public administrator

Course outcome

Paper I Administrative Theory

It intends to acquaint the students with the basic knowledge of evolution of the separate discipline as a public administration along with various theories and principles of public administration

Paper II Indian Administration

The paper attempts to make the students understand the system of Indian administration and governance students understand and the basic structure, function and behaviour of Indian administration.

Paper III Personal Administration

This course intends the familiarization the student bureaucracy various aspects of personnel administration such as classification of services recruitment and training and promotion.

Paper IV Financial Administration

This course intends to familiarize the students about financial structure of the government economic, policy, fiscal policy.

Paper V Local government in India

To acquaint the students with the evolution of urban and rural governance constitutional provision and it's working along with issue and challenges related to urban and rural government

Paper VI Development administration

This course attempts to develop a better understanding about development administration under this student will be taught about concepts debates machinery of planning role of civil society people's participation and so on.

Physical Education

Course outcomes

- The development of skills related to physical fitness i.e. strength, flexibility, movement, endurance etc.
- The development of knowledge and skills regarding teamwork and fair play.
- Physical education or activities can improve your health and reduce the risk of developing several diseases.
- It promotes physical and mental alertness.
- The another outcomes are verbal information, demonstration method for coaching, motor skills and information about healthy lifestyle, self-confidence and self work as they relate to physical education recreation programmes. Physical education and sports develops teamwork, leadership, punctuality, discipline quality and social adjustment

Sociology

Course outcomes

By the time of graduation, sociology majors should be able to:

- Explain the sociological perspective, broadly defined; use sociological theory to explain social problems and issues; make theoretically-informed recommendations to address current social problems; and demonstrate the utility of the sociological perspective for their lives.
- Demonstrate the ability to interpret, locate, evaluate, generate, and use sociologically relevant data to test hypotheses and draw evidence-based conclusions.
- Integrate sociological theory, research, and data in order to assess various explanations of social phenomena and to assess social policy.

Fine Arts

Course Outcomes

- Formulate questions and responses clearly and precisely based on relevant information and research and to come to well reasoned conclusions and solutions. Students will develop the ability to think open-mindedly with the ability to consider alternative systems of thought that challenge received notions and social cultural bias.
- Effectively express concepts in concrete form.

- Skillfully create artistic form using techniques and methods appropriate to the intended result.
- Understand that the meaning of a work of art is conditioned by the manner in which it is exhibited or otherwise presented and distributed. They will have the ability to consider methods of presentation and distribution in innovative ways that respond to, and potentially influence, existing conditions in the field.
- Consider the role of art making in the larger social context.
- Develop an awareness of current professional standards in their chosen media and in the larger field of contemporary art as well as the ability to effectively meet or redefine those standards. Recognizing that one aspect of being a professional artist is autonomy; Fine Arts Students will develop artistic autonomy to identify and focus on their practice, act upon their ideas and continue to learn over the length of their career.

Religion
Course Outcomes

1. **Critical Thinking Skills:** Acquire and further develop core humanities skills of critical thinking, textual analysis, expository and persuasive writing, and organized research that display academic knowledge of religious studies.
2. **Citizenship Skills:** Articulate the roles of religiosity in a secular democratic society and cultivate characteristics of engaged citizenship.
3. **Global Literacy Skills:** Demonstrate sufficient familiarity with three classical world religions, including knowledge of at least one religious cultural tradition outside of European/American culture.
4. **Methodological Skills:** Utilize various disciplinary approaches – historical, literary, philosophical, religious, ethical – to articulate the concept and meaning of "religion" and the nature of its academic study.
5. **Problem-Solving Skills:** Apply scholarly methods to understand how religious communities address concrete issues such as environment, gender, violence, and secularity.

Home science

Course Outcomes

1. Human resources & management
2. Clothing & textile
3. Food & nutrition

1. HUMAN RESOURSES & MANGEMENT (T) -The aim of the B.A in Human Resource Management (HRM) is to give students the knowledge, understanding and key skills that are required by today's HR professionals and to enable students to effectively contribute to dynamic organizations. Critically assess existing theory and practice in the field

of HRM. Develop an ability to undertake qualitative and quantitative research. Apply knowledge about qualitative and quantitative research to an independently constructed piece of work Respond positively to problems in unfamiliar contexts. Identify and apply new ideas, methods and ways of thinking. Work effectively with colleagues with diverse skills, experience levels and way of thinking. Be able to evaluate HRM related social, cultural, ethical and environmental responsibilities and issues in a global context.

2. **CLOTHING& TEXTILES SCIENCE (T) -** To develop an understanding of textiles materials i.e. fibre, yarns, fabrics and their manufacturing process. To understand the suitability of different fabrics and their end use. To introduce the basic scientific concepts related to processing and production of textiles.
3. **Food science & nutrition (T) -** To develop an understanding of textiles materials i.e. fibre, yarns, fabrics and their manufacturing process. To understand the suitability of different fabrics and their end use. To introduce the basic scientific concepts related to processing and production of textiles.

Economics

Program Outcomes The undergraduate Economics programs help students to learn how to apply economic analysis to everyday problems in real world to understand current events and evaluate specific policy proposals.

Program Specific Outcomes

Core1: Micro Economics It helps the students to identify and explain micro economic concepts and theories related to the consumer and producer behavior in the market, market structure, factor pricing and welfare economics.

Core2: Macro Economics The students will be able to understand the overall aggregate economic activities such as output, unemployment, inflation, national income, price level and the major challenges associated with the measurement of these aggregates.

Core3: Indian Economy Indian economy gives students the knowledge of planning undertaken by the government of India and to understand the success or failure of policies to achieve intended outcomes and economic reforms taken by the government.

Core4: Economics of Development It provides knowledge to students in understanding the theories and strategies of growth and development.

Core5: International Economics The students will be able to understand the theories of international trade and to examine the impact of trade policies on the dynamic economy.

Core6: Public finance The students will acquire knowledge to understand the nature and scope of public finance and various sources of finance from where government generates funds and their utilization in various fields for the development and welfare of the country.

Core7: Basic Quantitative Methods Students will be able to demonstrate the role of quantitative techniques most commonly used in economic problems. The students will acquire knowledge to understand the basic mathematical and statistical concepts.

Department of Fashion Technology and Home Science

B.Voc Fashion Technology and Garment Designing

Programme Outcomes

The B.Voc Programme is focused on to provide universities and colleges undergraduate studies which would also incorporate specific job roles based on general education. 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.

Specific Outcomes

Bachelor of Vocation (B.Voc.) Degree in Fashion Designing will acquaint students with the relevant technical expertise to step into a professional world, in skills like drawing, draping, pattern making, sewing, haute couture along with training in production.

The programme establishes strong technical skills required to work as an innovative practicing fashion designer. Students also develop the required technical skills in custom and commercial quality garment construction as well as pattern making both manually and using computer-based design.

Course Outcomes

1. **Personality development and Communication skills** Communication skills impact our ability to persuade people – to enroll people in our ideas, our visions, and our visions. This has a huge impact on how effective we are and the outcomes we experience in life. Listening is also crucial for effectiveness – particularly in sales or leadership roles.
2. **Basic computer skills/ Computer Aided Fashion Design** CAD allows designers to view designs of clothing on virtual models and in various colors and shapes, thus saving time by requiring fewer adjustments of prototypes and samples later. Software can help students draw, create woven textures, drape models to create patterns, adjust sizes and even determine fabric colors.
3. **Concept of fashion** Explain the meaning and definition of Fashion. Describe the Terminologies of Fashion. Explain the fashion terms and their meaning. Enumerate the skills required for leather footwear. Explain the meaning and significance of Eyelets and Shoe Lacing System. Explain the fashion terms and their meaning. Describe the technology for modify of Fashion Style
4. **Textile Science -** To develop an understanding of textiles materials i.e. fibre, yarns, fabrics and their manufacturing process. To understand the suitability of different fabrics and their end use. To introduce the basic scientific concepts related to processing and production of textiles.
5. **Pattern making and construction** making basic adaptations to a pattern to accommodate the key measurements. Interpreting pattern symbols and using a patterns guide sheet to correctly place pattern pieces to suit material width and type. Developing a construction plan, using appropriate language, symbols and diagrams.

6. **Design Illustration** Present fashion and textiles design work and effectively utilize various visual platforms. Creatively problem solves approaches to fashion and textile design practices through illustration processes. Develop an original aesthetic sensibility to

illustration and visual presentation. Demonstrate a capacity to use creative approaches to technology based activities for presentation and generation of fashion and textiles design work. Develop appropriate technical skills for both digital and hand illustration techniques.

7. **Garment Quality and cost control** In the subject, students learn about quality control system to maximise the production of goods within the specified requirements, doing so the first attempt. To achieve an acceptable level of satisfaction quality control is important for Design quality Stylistic approach.

8 **Indian Traditional Textiles -** Be able to appreciate traditional textiles of India and their material, colours, texture and motifs. To be able to identify and appreciate various Indian traditional crafts /garments and accessories. To understand the importance of textile craftswith the historical perspective, the impact of modernization. To be able to apply Indian traditional designs and motifs for contemporary designs. To be able to identify traditionalIndian textiles and their product diversification in the local markets.

9. **Principles of marketing** This course provides students with an overview of the marketing function with an emphasis on creating value through marketing, market research, consumer behavior, pricing strategies, marketing channels, and various methods of promotion.
10. **Garment Production Management** Provide basic infrastructure and guidance to support and enhance quality in the textile industry.
11. **History of Indian costumes** To gain knowledge of the significant development in production of textiles in the world. To assess similarities and dissimilarities in different civilizations in terms of production, Ornamentation and usage. To acquaint students with the prevailing designs of costumes worn by people of different countries during different periods.
12. **Fashion Marketing** Fashion Marketing aims at giving in-depth knowledge to the individual about the most important aspects of retail fashion industry which includes marketing management and merchandising. The programme offers intensive studies about brand building, brand marketing, customer relationship management, digital fashion marketing, consumer behavior, new approach to retailing and faster and innovative marketing strategies build the current thinking and the latest development in the field.
13. **Draping Methods** forms the design on the model. fixes the details in accordance with the needs of the draping method.
14. **Fashion Show -** Organizes the design process according to the collection.

Determines the collection theme.

Draws sketches for the collection.

Designs pieces composing the collection.

Decides main material of the collection.

Establishes relationship between material and product.

Neelam Head
Deptt. Of Fashion Tech.
Guru Nanak College
Sudhlada(Mansa)

M.Sc. Fashion Technology

Programme Outcomes

To promote an understanding of Fashion and Textile Designing with current needs of fashion, contractual furnishings, home textiles, and the business textile products. To provide hands-on experience using a set of complex technologies found in industry today to build prototypical solutions to solve current needs. To provide experience in responding to market opportunities with creative and innovative products that integrate a set of academic disciplines such as textile materials, design Fundamentals, business fundamentals, sourcing, data mining of market information, and new developments in material science and engineering. To create an educational environment that approximates the actual conditions in industry by building studios and workshops containing state-of-the-art systems, resources, technologies and a community of creativity and innovation. To develop strong multi-functional teamwork and communication skills using visual and verbal Presentation assignments and interfaces with practitioners in design community and the industry.

Course Outcomes

1. **Textiles Science (T) -** To develop an understanding of textiles materials i.e. fibre, yarns, fabrics and their manufacturing process. To understand the suitability of different fabrics and their end use. To introduce the basic scientific concepts related to processing and production of textiles.

2. **Indian Traditional Textiles (T) -**Be able to appreciate traditional textiles of India and their material, colours, texture and motifs. To be able to identify and appreciate various Indian traditional crafts /garments and accessories. To understand the importance of textile crafts with the historical perspective, the impact of modernization. To be able to apply Indian traditional designs and motifs for contemporary designs. To be able to identify traditional Indian textiles and their product diversification in the local markets.

3. **Communications Skills (T) -**Students will develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively withothers. Such skills could include communication competencies such as managing conflict, understanding small group processes, active listening, appropriate self- disclosure, etc.

4. **Fashion Illustration (P) -** Present fashion and textiles design work and effectively utilize various visual platforms. Creatively problem solves approaches to fashion and textile design practices through illustration processes. Develop an original aesthetic sensibility

5. **Research Methodology (T) -** Research methodologies in education, both qualitative and quantitative. The subject introduces students to contemporary perspectives in educational research, and in particular focuses on developing a range of skills involved in formulating a research proposal; including framing research questions, reviewing the literature and choosing appropriate methodologies for different types of study.

6. **Computer aided Fashion (P) –** The garment industry is rapidly growing with new concepts for keeping fashion business alive. To survive in the fashion industry new innovations are necessary for a while. In order to meet the demands for the market, a computer-aided design (CAD) system gives opportunity for mass customization in fashion. The system enables to create more styles, random changes, make new design, dimension of collection, pattern generation, graded size pattern, marker creation and fabric cutting. By integrating the system with the processes of garment sewing, test of fit and final adjustment, mass customization can be realized in the apparel industry. For the manufacturers, the efficiency of the supply chain can be improved by reducing human efforts, costs, and production time. For the customers, better fittings with faster delivery stimulate the desire of purchase and enhance their satisfaction.

7. **Drafting & garment Construction (P) -**Demonstrate self-directed learning and decision-making in pattern making and construction. Demonstrate appropriate levels of technical skills for patternmaking and garment construction. Develop accuracy, rigor and care for patternmaking and construction documentation. Develop an understanding of methods to enable accuracy, rigour and care when constructing finished patterns and garments. Utilize a variety of research methods for pattern making and construction including visual research.

8. **Retail Management & Merchandising (T)** - The overall objective of retail marketing is creating and developing services and products that meet the specific needs of customers and offering these products at competitive, reasonable prices that will still yield profits.

9. **Statistic (T)-** Student will effectively use professional level technology tools to support the study of mathematics and statistics. Students will clearly communicate quantitative ideas both orally and in writing to a range of audiences.

10. **Quality Control Process(T)-** To explain quality and quality control, define quality, explain differences between quality control and statistical quality control, determine several quality concept, define Quality Assurance System and Total Quality Management, express the main attributes of Quality Assurance System

11. **Fashion Entrepreneurship (T) -** Entrepreneurship is very new regarding scientific research, is approached locally and globally, to contribute to the scientific exploration of fashion design and entrepreneurial activity in the field. Moreover, this study seeks to understand who are these fashion design entrepreneurs in Portugal and abroad, as well as comprehending their stories, the point of view as professionals of the industry, the main difficulties they encountered in their journey, and most importantly, if fashion design higher-education can contribute to the increase of such behavior.

12. **Portfolio (P) -**Portfolios are a great way to demonstrate the competencies you would list on a resume or talk about in an interview — they allow you to show and not just tell. During a job search, the portfolio showcases your work to potential employers. It presents evidence of your relevant skills and abilities.

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हिन्दी विभाग

उद्देश्य -

1. छात्रों को संवेदनशील नागरिक बनाने के लिए, राष्ट्रीय एकता के महत्व को समझने के लिए तैयार करना, हिंदी के उपयोग और संचार कौशल में सुधार करना, हिंदी साहित्य के विभिन्न पहलुओं पर प्रकाश डालना है।
2. समाज के विभिन्न समुदायों के प्रति सहिष्णता की भावना का विकास करना।
3. भारतीय राष्ट्रीय भाषा और साहित्य के विभिन्न विषयों में ज्ञान की खोज में छात्रों का मार्गदर्शन और सहायता करना।
4. उनके पढ़ने, लिखने और अभिव्यक्ति के कौशल में सुधार करना।
5. बोलचाल की हिंदी के माध्यम से प्रभावी ढंग से संवाद करने और वक्ता का उच्चारण प्राप्त करने की उनकी क्षमता को बढ़ाने के लिए।
6. विभिन्न साहित्यिक विधाओं की जानकारी देना।

अधिगम प्रतिफल

हिन्दी काव्य – 1

1. विद्यार्थियों की आदिकालीन व मध्यकालीन हिन्दी काव्य में रुचि उत्पन्न होगी।
2. आदिकालीन व मध्यकालीन काव्य की प्रवृत्तियों से अवगत होंगे।
3. साहित्य के माध्यम से समाज की परिस्थितियों से अवगत होंगे।
4. हिन्दी काव्य के नवीन रूपों तथा भाषा से परिचित होंगे।

हिन्दी भाषा – उद्भव और विकास

1. विद्यार्थी हिन्दी भाषा की ऐतिहासिक पृष्ठभूमि से अवगत होंगे।
2. हिन्दी का भौगोलिक विस्तार और हिन्दी की उपभाषाएं विद्यार्थियों को सीखने को मिलेगी।
3. हिन्दी की संवैधानिक स्थिति से परिचित होंगे।
4. देवनागरी लिपि की विशेषताओं की जानकारी मिलेगी।

हिन्दी साहित्य का इतिहास

1. विद्यार्थी आदिकाल से लेकर मध्यकाल के पूर्वार्ध तक के सामाजिक, राजनीतिक संदर्भों का ज्ञान प्राप्त कर सकेंगे।
2. हिन्दी साहित्य के प्रारंभिक और विकासात्मक स्वरूप से परिचित हो सकेंगे।
3. हिन्दी साहित्य के साहित्यकारों और उनकी रचनाओं के बारे में जान सकेंगे।
4. हिन्दी के भावगत, भाषागत और शैलीगत विकास से परिचित हो सकेंगे।

हजारी प्रसाद द्विवेदी – विशेष अध्ययन

1. विद्यार्थी भारतीय संस्कृति और उसकी देन से अवगत होंगे।
2. साहित्य का महत्व और लक्ष्य ज्ञात होगा।
3. सिक्ख इतिहास से परिचित होंगे।

हिन्दी काव्य – 2

1. विद्यार्थी सगुण भक्ति धारा के प्रारंभिक और विकासात्मक स्वरूप से परिचित होंगे।
2. भक्ति साहित्य के साहित्यकारों और उनकी रचनाओं के बारे में जान सकेंगे।
3. साहित्य का भावात्मक और राजसत्तात्मक प्रभाव का ज्ञान प्राप्त होगा।

भाषा विज्ञान

1. विद्यार्थियों को हिन्दी भाषा की उत्पति के सिद्धान्तों की जानकारी प्राप्त होगी।
2. भाषा के स्वरूप और महत्त्व का ज्ञान प्राप्त होगा।
3. वैज्ञानिक और उपयोगी लिपि नागरी का अपेक्षित ज्ञान प्राप्त होगा।

हिन्दी साहित्य का इतिहास (आधुनिक काल)

1. भारतेंदु युग से छायावाद तक के काल की परिस्थितियों व परिवेश से विद्यार्थी परिचित हो सकेंगे।
2. तत्कालीन राजनीति, सांस्कृतिक आंदोलनों व उनके साहित्यिक रूपान्तरण के बारे में जान सकेंगे।
3. इतिहास दृष्टि और लोकजीवन तथा प्रकृति से कविता के सरोकार को रेखांकित कर सकेंगे।
4. गद्य की विधाओं से परिचित होंगे।

हिन्दी कथा साहित्य

1. विद्यार्थी सम्पूर्ण मानव जगत की मानवीयता से परिचित होंगे।
2. रचनात्मक विचार और सृजन धर्म का विकास होगा।
3. गंभीर भावबोध को समझने का अवसर मिलेगा।
4. जीवन की वास्तविकता से परिचित होंगे।

आधुनिक हिन्दी काव्य – 1

1. विद्यार्थियों की आधुनिक हिन्दी काव्य में रुचि उत्पन्न होगी।
2. आधुनिक काव्य की प्रवृत्तियों से अवगत होंगे।
3. साहित्य के माध्यम से समाज की परिस्थितियों से अवगत होंगे।
4. हिन्दी काव्य के नवीन रूपों तथा भाषा से परिचित होंगे।

भारतीय काव्यशास्त्र

1. विद्यार्थी काव्य के स्वरूप व काव्य के भेदों से परिचित होंगे।
2. भारतीय काव्यशास्त्र के विभिन्न सम्प्रदायों तथा शब्द-शक्तियों से परिचित होंगे।
3. काव्यशास्त्र में रुचि पैदा होगी।
4. साहित्य की समझ पैदा होगी।

हिन्दी नाटक और निबन्ध

1. विद्यार्थियों की नाटक विधा में रुचि पैदा होगी।
2. रामचन्द्र शुक्ल के निबन्धों के माध्यम से विद्यार्थियों में मानवीय गुण पैदा होंगे।
3. पारिवारिक विघटन के विभिन्न कारणों से अवगत होंगे।
4. सैन्य जीवन में होने वाले दलित शोषण के यथार्थ से परिचित होंगे।

कबीर - विशेष अध्ययन

1. विद्यार्थी भक्तिकालीन साहित्य और उसकी परिस्थितियों से परिचित होंगे।
2. भक्तिकालीन साहित्य की प्रवृत्तियों से परिचित होंगे।
3. कबीर के साहित्य के माध्यम से तत्कालीन सामाजिक परिस्थितियों से अवगत होंगे।
4. बौद्धिक विकास में वृद्धि होगी।

आधुनिक हिन्दी काव्य – 2

1. विद्यार्थी आधुनिक काव्य के विभिन्न पड़ावों व मुख्य कवियों से परिचित होंगे।

2. काव्य के प्रति रुचि बढ़ेगी।

3. आधुनिक हिन्दी काव्य की पृष्ठभूमि से परिचित होंगे।

पाश्चात्य काव्यशास्त्र

1. विद्यार्थी पाश्चात्य काव्यशास्त्र से परिचित होंगे तथा उनकी विषय संबंधी रुचि बढ़ेगी।

2. काव्यशास्त्र की विभिन्न प्रवृत्तियों से परिचित होंगे।

3. शोध-प्रविधि के विभिन्न प्रकारों से अवगत होंगे।

4. पाश्चात्य काव्यशास्त्र के विभिन्न सिद्धांतों से परिचित होंगे।

प्रयोजनमूलक हिन्दी

1. विद्यार्थी हिन्दी की प्रयोजनीयता से परिचित होंगे।

2. हिन्दी के विभिन्न रूपों से परिचित होंगे।

3. जनसंचार के विभिन्न माध्यमों के बारे में जानकारी प्राप्त होगी।

4. हिन्दी भाषा में रोजगार की सम्भावनाओं से अवगत होंगे।

हिन्दी आलोचना और आलोचक

1. विद्यार्थी हिन्दी आलोचना के विभिन्न चरणों से परिचित होंगे।
2. बौद्धिक विकास व साहित्य के प्रति रुचि विकसित होगी।
3. साहित्य विश्लेषण के कौशल का विकास होगा।

Head
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Budhlada (Mansa)

GURU NANAK COLLEGE BUDHLADA, District Mansa, Punjab-151502

Department of Punjabi

ਐਮ.ਏ.-ਪੰਜਾਬੀ
ਸਮੈਸਟਰ-ਪਹਿਲਾ

ਪੇਪਰ- 1 ਪੰਜਾਬੀ ਸਾਹਿਤ ਦਾ ਇਤਿਹਾਸ (ਕੋਰ ਕੋਰਸ)
ਕੋ : ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਵਿੱਚ ਲਿਖੇ ਗਏ ਸਾਹਿਤ ਨੂੰ ਪੰਜਾਬੀ ਸਾਹਿਤ ਕਿਹਾ ਜਾਂਦਾ ਹੈ।ਪੰਜਾਬੀ ਸਾਹਿਤ ਸਿਰਜਨ ਪ੍ਰਕਿਰਿਆ ਸਮੇਂ ਪੈਦਾ ਹੋਈਆਂ ਰਾਜਸੀ,ਸਮਾਜਕ ਅਤੇ ਸੱਭਿਆਚਾਰਕ ਪਰਿਸਥਿਤੀਆਂ ਦੇ ਸਮੁੱਚੇ ਪਿਛੋਕੜ ਅਤੇ ਇਤਿਹਾਸਕ ਵਿਕਾਸ ਨੂੰ ਉਜਾਗਰ ਕਰਕੇ ਇਸ ਸਮੇਂ ਦੌਰਾਨ ਪੈਦਾ ਹੋਈਆਂ ਪਰਿਸਥਿਤੀਆਂ ਦਾ ਮੁਲਾਂਕਣ ਕਰਨਾ ਹੈ। ਇਸ ਮੁਲਾਂਕਣ ਦੇ ਨਾਲ-ਨਾਲ ਆਦਿਕਾਲੀਨ ਅਤੇ ਮੱਧਕਾਲੀਨ ਸਾਹਿਤ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਮਨੁੱਖੀ ਜੀਵਨ ਦੀਆਂ ਘਟਨਾਵਾਂ, ਆਦਿਕਾਲ ਤੋਂ ਲੈ ਕੇ ਅਜੋਕੇ ਸਮੇਂ ਤੱਕ ਦੇ ਸਾਹਿਤ ਪਹਿਲੂਆਂ ਨੂੰ ਸਮਕਾਲੀ ਪਰਿਪੇਖ ਵਿੱਚ ਇਸਦੀ ਪ੍ਰਾਸੰਗਿਕਤਾ ਨੂੰ ਵਿਸ਼ਲੇਸ਼ਿਤ ਕਰਨ ਲਈ ਸੂਝ ਪੈਦਾ ਕਰਦਾ ਹੈ।

ਪੇਪਰ-2 ਸਾਹਿਤ ਅਲੋਚਨਾ ਦੇ ਸਿਧਾਂਤ (ਭਾਰਤੀ ਕਾਵਿ ਸ਼ਾਸਤਰ) (ਕੋਰ ਕੋਰਸ)
ਕੋ : ਸਾਹਿਤ ਦੀ ਪੜਚੋਲ ਕਰਨ ਲਈ ਸਾਹਿਤਕ ਸਿਧਾਂਤਾਂ ਦੀ ਲੋੜ ਹੁੰਦੀ ਹੈ।ਇਸ ਤੋਂ ਬਿਨਾਂ ਕਿਸੇ ਵੀ ਸਾਹਿਤਕ ਰਚਨਾ ਦਾ ਡੂੰਘਾਈ ਨਾਲ ਅਧਿਐਨ ਨਹੀਂ ਕੀਤਾ ਜਾ ਸਕਦਾ। ਇਸ ਲਈ ਇਸ ਵਿਸ਼ੇ ਤਹਿਤ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਰਤੀ ਸਾਹਿਤਕ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਸਥਾਰ ਪੂਰਵਕ ਅਧਿਐਨ ਕਰਵਾਇਆ ਜਾਂਦਾ ਹੈ।
ਇਸ ਸਮੈਸਟਰ ਵਿੱਚ ਸੰਸਕ੍ਰਿਤ ਵਿਦਵਾਨਾਂ (ਰਸ ਸਿਧਾਂਤ, ਸਾਧਾਰਨੀਕਰਨ, ਵਕ੍ਰੋਕਤੀ, ਅਲੰਕਾਰ, ਰੀਤੀ, ਧੁਨੀ ਅਤੇ ਅਚਿੱਤਰ) ਦੇ ਸਾਹਿਤਕ ਸਿਧਾਂਤਾਂ ਦਾ ਅਧਿਐਨ ਕੀਤਾ ਜਾਂਦਾ ਹੈ।ਇਸ ਤੋਂ ਇਲਾਵਾ ਮੁੱਢਲੇ ਪੰਜਾਬੀ ਆਲੋਚਕਾਂ ਦੀ ਆਲੋਚਨਾ- ਖੂਬੀਆਂ ਅਤੇ ਸੀਮਾਵਾਂ ਦਾ ਵਿਸ਼ਲੇਸ਼ਣ ਕਰਕੇ ਮੈਟਾ ਆਲੋਚਨਾ ਦੇ ਸਿਧਾਂਤ ਨੂੰ ਸਿਖਾਇਆ ਅਤੇ ਪੜ੍ਹਾਇਆ ਜਾਂਦਾ ਹੈ।

ਪੇਪਰ-3 ਪੰਜਾਬੀ ਨਾਟਕ (ਵਿਕਲਪ-1) (ਇਲੈਕਟਿਵ ਕੋਰਸ)
ਕੋ1: ਨਾਟਕ ਨੂੰ ਸਮਾਜ ਦਾ ਸ਼ੀਸ਼ਾ ਮੰਨਿਆ ਜਾਂਦਾ ਹੈ। ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਨਾਟਕ ਵੀ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਸਮਾਜ ਦੀ ਸਮੱਸਿਆ ਨੂੰ ਦਰਸਾਉਂਦਾ ਹੈ।
ਕੋ2: ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ ਅਤੇ ਸਮਾਜ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨਾਲ ਜੋੜੇਗਾ।

ਪੇਪਰ-4 ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਾਵਿ (ਵਿਕਲਪ-1) (ਚੋਣਵਾਂ ਕੋਰਸ)
ਕੋ: ਸਾਹਿਤ ਨੂੰ ਸਮਕਾਲੀ ਸਮਾਜ ਦਾ ਸ਼ੀਸ਼ਾ ਮੰਨਿਆ ਜਾਂਦਾ ਹੈ। ਇਸੇ ਤਰ੍ਹਾਂ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਵੀ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਸਮਾਜ ਦੀ ਸਮੱਸਿਆ ਦੀ ਤਰਜਮਾਨੀ ਕਰਦੀ ਹੈ। ਇਸ ਵਿਸ਼ੇ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਕਸਦ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਆਧੁਨਿਕ ਸਮੇਂ ਦੇ ਹਰ ਸਮਾਜਿਕ ਅਤੇ ਸੱਭਿਆਚਾਰਕ ਮੁੱਦੇ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਣਾ ਹੈ। ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਸ ਵਿਸ਼ੇ ਨੂੰ ਪੜ੍ਹ ਕੇ ਆਨੰਦ ਵੀ ਮਿਲਦਾ ਹੈ ਜਿਸ ਨਾਲ ਉਨ੍ਹਾਂ ਨੂੰ ਮਾਨਸਿਕ ਤਣਾਅ ਤੋਂ ਛੁਟਕਾਰਾ ਮਿਲਦਾ ਹੈ।

ਇਸ ਸਮੈਸਟਰ ਵਿੱਚ ਵਿਦਿਆਰਥੀ ਕਵਿਤਾ ਦੀ ਪਰਿਭਾਸ਼ਾ, ਕਵਿਤਾ ਦੇ ਤੱਤ, ਕਵਿਤਾ ਦੀ ਵਿਚਾਰਧਾਰਾ, ਕਵਿਤਾ ਦਾ ਵਿਹਾਰਕ ਅਧਿਐਨ, ਪ੍ਰੋ: ਪੂਰਨ ਸਿੰਘ, ਪ੍ਰੋ.ਮੋਹਨ ਸਿੰਘ, ਬਾਵਾ ਬਲਵੰਤ ਅਤੇ ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ ਦੀ ਕਵਿਤਾ ਦੇ ਸਰੋਕਾਰ, ਵਿਚਾਰਧਾਰਾ ਅਤੇ ਕਲਾ ਦੇ ਪਹਿਲਆਂ ਦਾ ਗਿਆਨ ਹਾਸਿਲ ਕਰਦੇ ਹਨ।

ਪੇਪਰ-5 ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਗਲਪ (ਵਿਕਲਪ-2) (ਚੋਣਵਾਂ ਕੋਰਸ)
ਕੋ: ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਪ੍ਰਤੀ ਰੁਚੀ ਪੈਦਾ ਕਰਨਾ ਹੈ। ਇਸ ਕੋਰਸ ਦੇ ਪਹਿਲੇ ਸਮੈਸਟਰ ਵਿੱਚ ਪੰਜਾਬੀ ਨਾਵਲ ਦੀਆਂ ਮਹੱਤਵਪੂਰਨ ਟੈਕਸਟਾਂ ਰਾਹੀਂ ਸਮਕਾਲੀ ਪੰਜਾਬੀ ਅਤੇ ਪਰਵਾਸੀ ਸਮਾਜ ਦੀਆਂ ਪ੍ਰਮੁਖ ਸਮੱਸਿਆਵਾਂ ਤੇ ਉਨ੍ਹਾਂ ਦੇ ਹੱਲ ਲੱਭਣ ਦਾ ਯਤਨ ਕੀਤਾਂ ਜਾਂਦਾ ਹੈ। ਨਾਵਲ ਉਹ ਲਿਖਤੀ ਰਚਨਾਵਾਂ ਹਨ ਜਿਨ੍ਹਾਂ ਵਿੱਚ ਪਾਠਕ ਜੀਵਨ ਦੀਆਂ ਕਠੋਰ ਹਕੀਕਤਾਂ ਨੂੰ ਗਾਲਪਨਿਕ ਬਿੰਬਾਂ ਰਾਹੀਂ ਜਾਣੂ ਹੁੰਦੇ ਹਨ, ਕਿਉਂਕਿ ਨਾਵਲ ਇੱਕ ਲੇਖਕ ਦੁਆਰਾ ਲਿਖੀ ਗਈ ਜੀਵਨ ਕਹਾਣੀ ਹੈ। ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸਾਹਿਤਕ ਰੁਚੀ ਨੂੰ ਵਿਸ਼ਾਲ ਕਰਨ ਅਤੇ ਇੱਕ ਬਿਹਤਰ ਜੀਵਨ ਜਿਉਣ ਵਿੱਚ ਮਦਦ ਕਰਦਾ ਹੈ।

ਸਮੈਸਟਰ-ਦੂਜਾ

ਪੇਪਰ-1 ਪੰਜਾਬੀ ਸਾਹਿਤ ਦਾ ਇਤਿਹਾਸ (ਕੋਰ ਕੋਰਸ)

ਕੋ: ਇਸ ਕੋਰਸ ਵਿੱਚ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਸਿਰਜਣਾ ਦੇ ਇਤਿਹਾਸਕ ਪਿਛੋਕੜ,ਆਧੁਨਿਕਤਾ,ਆਧੁਨਿਕ ਸੰਵੇਦਨਾ ਅਤੇ ਇਸ ਵਿੱਚੋਂ ਪੈਦਾ ਹੋਇਆ ਆਧੁਨਿਕ ਸਾਹਿਤ ਅਤੇ ਪ੍ਰਵਿਰਤੀਆਂ ਰਾਹੀਂ ਸਮਕਾਲੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੇ ਸੁਭਾਅ ਬਾਰੇ ਚੇਤਨਾ ਪੈਦਾ ਕਰਨੀ ਹੈ।ਪੰਜਾਬੀ ਸਾਹਿਤ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਮਨੁੱਖੀ ਜੀਵਨ ਦੀਆਂ ਘਟਨਾਵਾਂ, ਆਦਿਕਾਲ ਤੋਂ ਲੈ ਕੇ ਅਜੋਕੇ ਸਮੇਂ ਤੱਕ ਦੇ ਸਾਹਿਤਕ ਤੇ ਸਮਾਜਕ ਪਹਿਲੂਆਂ ਬਾਰੇ ਆਲੋਚਨਾਤਮਕ ਦ੍ਰਿਸ਼ਟੀ ਪੈਦਾ ਕਰਦੀ ਹੈ।ਇਹ ਕੋਰਸ ਸਾਹਿਤ ਦੀ ਇਤਿਹਾਸਕ ਪਿੱਠਭੂਮੀ ਰਾਹੀਂ ਪੰਜਾਬੀ ਸਮਾਜ ਤੇ ਜਨ-ਜੀਵਨ ਦੇ ਇਤਿਹਾਸ ਨਾਲ ਜੋੜਦਾ ਹੈ।

ਪੇਪਰ-2 ਸਾਹਿਤ ਅਲੋਚਨਾ ਦੇ ਸਿਧਾਂਤ (ਪੱਛਮੀ ਕਾਵਿ ਸ਼ਾਸਤਰ) (ਕੋਰ ਕੋਰਸ)

ਕੋ1: ਸਾਹਿਤ ਦੀ ਜਾਂਚ ਕਰਨ ਲਈ ਸਾਹਿਤਕ ਸਿਧਾਂਤਾਂ ਦੀ ਲੋੜ ਹੁੰਦੀ ਹੈ। ਇਸ ਤੋਂ ਬਿਨਾਂ ਕਿਸੇ ਵੀ ਸਾਹਿਤਕ ਰਚਨਾ ਦਾ ਡੂੰਘਾਈ ਨਾਲ ਅਧਿਐਨ ਨਹੀਂ ਕੀਤਾ ਜਾ ਸਕਦਾ। ਇਸ ਲਈ ਇਸ ਵਿਸ਼ੇ ਅਧੀਨ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੱਛਮੀ ਸਾਹਿਤਕ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਸਥਾਰ ਪੂਰਵਕ ਅਧਿਐਨ ਕੀਤਾ ਜਾਂਦਾ ਹੈ।

ਕੋ2: ਗ੍ਰੀਕੋ-ਰੋਮਨ ਸਾਹਿਤਕ ਸਿਧਾਂਤ (ਇਮਟੇਸ਼ਨ ਥਿਊਰੀ, ਕੈਥਾਰਸਿਸ, ਅਤੇ ਤ੍ਰਾਸਦੀ), ਪੱਛਮੀ ਸਾਹਿਤਕ ਸਿਧਾਂਤ (ਮਾਰਕਸਵਾਦ, ਨਵ-ਮਾਰਕਸਵਾਦ, ਮਨੋਵਿਸ਼ਲੇਸ਼ਣ, ਸੰਰਚਨਾਵਾਦ, ਉੱਤਰ-ਸੰਰਚਨਾਵਾਦ, ਆਧੁਨਿਕਤਾਵਾਦ, ਉੱਤਰ-ਆਧੁਨਿਕਤਾਵਾਦ, ਨਾਰੀਵਾਦ, ਹੋਂਦਵਾਦ ਆਦਿ) ਦੀਆਂ ਪ੍ਰਾਪਤੀਆਂ ਅਤੇ ਸੀਮਾਵਾਂ ਨੂੰ ਉੱਘੇ ਪੰਜਾਬੀ ਆਲੋਚਕਾਂ ਦੀ ਆਲੋਚਨਾ-ਦ੍ਰਿਸ਼ਟੀ ਰਾਹੀਂ ਸਮਝਾਉਣਾ ਹੈ।

ਪੇਪਰ- 3 ਪੰਜਾਬੀ ਨਾਟਕ (ਵਿਕਲਪ-1) (ਇਲੈਕਟਿਵ ਕੋਰਸ)

ਕੋ1: ਨਾਟਕ ਰੰਗਮੰਚ ਰਾਹੀਂ ਜੀਵਨ ਦੀਆਂ ਹਕੀਕਤਾਂ ਨੂੰ ਨਾਟਕੀ ਰੂਪ ਵਿੱਚ ਦਰਸਾਉਂਦਾ ਹੈ।ਪੰਜਾਬੀ ਦੀਆਂ ਮਹੱਤਵਪੂਰਨ ਨਾਟ-ਕਿਰਤਾਂ ਰਾਹੀਂ ਸਮਾਜ ਦੀਆਂ ਕਰੂਪ ਅਤੇ ਉਸਾਰੂ ਜੀਵਨ ਝਲਕੀਆਂ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀ ਸਮਾਜ ਦੇ ਯਥਾਰਥ ਨੂੰ ਜਾਣਨ ਦੀ ਕੋਸ਼ਿਸ਼ ਕਰਦਾ ਹੈ।
ਕੋ2: ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਸੱਭਿਆਚਾਰ ਅਤੇ ਸਮਾਜ ਦੀਆਂ ਸਮੱਸਿਆਵਾਂ ਨਾਲ ਜੋੜੇਗਾ।

ਪੇਪਰ- 4 ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਾਵਿ (ਵਿਕਲਪ-1) (ਚੋਣਵਾਂ ਕੋਰਸ)

ਕੋ: ਸਾਹਿਤ ਨੂੰ ਸਮਕਾਲੀ ਸਮਾਜ ਦਾ ਸ਼ੀਸ਼ਾ ਮੰਨਿਆ ਜਾਂਦਾ ਹੈ। ਇਸੇ ਤਰ੍ਹਾਂ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਵੀ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਸਮਾਜ ਦੀ ਸਮੱਸਿਆ ਦੀ ਤਰਜਮਾਨੀ ਕਰਦੀ ਹੈ। ਇਸ ਵਿਸ਼ੇ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਕਸਦ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਆਧੁਨਿਕ ਸਮੇਂ ਦੇ ਹਰ ਸਮਾਜਿਕ ਅਤੇ ਸੱਭਿਆਚਾਰਕ ਮੁੱਦਿਆਂ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਣਾ ਹੈ। ਵਿਦਿਆਰਥੀਆਂ ਇਸ ਵਿਸ਼ੇ ਨੂੰ ਪੜ੍ਹਕੇ ਜਿਥੇ ਸੁਹਜ ਮਾਣਦਾ ਹੈ,ਉਥੇ ਆਪਣੇ ਆਪ ਦਾ ਕਥਾਰਸਿਸ ਵੀ ਕਰਦਾ ਹੈ।
ਇਸ ਸਮੈਸਟਰ ਵਿੱਚ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਅਲੰਕਾਰਿਕ ਗੀਤ, ਗ਼ਜ਼ਲ, ਬਿਰਤਾਂਤਕ ਕਾਵਿ ਆਦਿ ਬਾਰੇ ਪੜ੍ਹਾਇਆ ਜਾਂਦਾ ਹੈ, ਇਸ ਤੋਂ ਇਲਾਵਾ ਪੰਜਾਬੀ ਕਵੀਆਂ ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ, ਸੁਰਜੀਤ ਪਾਤਰ, ਜਗਤਾਰ ਅਤੇ ਪਾਸ਼ ਦੀ ਕਵਿਤਾ ਦਾ ਆਲੋਚਨਾਤਮਕ ਅਧਿਐਨ ਕਰਵਾਇਆ ਜਾਂਦਾ ਹੈ।

ਪੇਪਰ-5 ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਗਲਪ (ਵਿਕਲਪ-2) (ਚੋਣਵਾਂਕੋਰਸ)

ਕੋ: ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਪ੍ਰਤੀ ਰੁਚੀ ਪੈਦਾ ਕਰਨਾ ਹੈ। ਇਸ ਕੋਰਸ ਦੇ ਦੂਜੇ ਸਮੈਸਟਰ ਵਿੱਚ ਗਲਪ ਸਾਹਿਤ ਦੀ ਵਿਧਾ ਕਹਾਣੀ ਬਾਰੇ ਪੜ੍ਹਾਇਆ ਜਾਂਦਾ ਹੈ। ਇਸ ਵਿਸ਼ੇ ਦਾ ਮੁੱਖ ਉਦੇਸ਼ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਪੰਜਾਬੀ ਸਾਹਿਤ ਨਾਲ ਜੋੜਨਾ ਹੈ। ਇਨ੍ਹਾਂ ਕਹਾਣੀਆਂ ਦੇ ਬਿਰਤਾਂਤ ਰਾਹੀਂ ਪਾਠਕ/ਵਿਦਿਆਰਥੀ ਜੀਵਨ ਦੀ ਅਸਲ ਤਸਵੀਰ ਦੇ ਪਾਸਾਰਾਂ ਨੂੰ ਸਮਝਣ ਦਾ ਯਤਨ ਕਰਦਾ ਹੈ ਜੋ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਕਾਰਾਤਮਕ ਰਵੱਈਏ ਨਾਲ ਜੀਵਨ ਦੇ ਖਤਰਿਆਂ ਦਾ ਸਾਹਮਣਾ ਕਰਨ ਵਿੱਚ ਮਦਦ ਕਰਦੀ ਹੈ।

ਸਮੈਸਟਰ- ਤੀਜਾ

ਪੇਪਰ-1 ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ (ਕੋਰ ਕੋਰਸ)

ਕੋ1: ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਇਸ ਕੋਰਸ ਦਾ ਪ੍ਰਕਾਰਜ ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਦੇ ਇਤਿਹਾਸਕ ਪੈਰਾਡਾਇਮ ਨੂੰ ਸਿਰਜ ਕੇ ਵਿਸ਼ਵ ਵਿੱਚ ਬੋਲੀਆਂ ਜਾਂਦੀਆਂ ਭਾਸ਼ਾਵਾਂ ਦੇ ਇਤਿਹਾਸਕ ਵਿਕਾਸ ਬਾਰੇ ਜਾਣਕਾਰੀ ਪ੍ਰਾਪਤ ਕਰਨਾ ਹੈ।ਸੰਸਾਰ ਭਾਸ਼ਾ-ਪਰਿਵਾਰਾਂ ਬਾਰੇ ਮੁੱਢਲੇ ਵਿਸ਼ਲੇਸ਼ਣ ਦੇ ਨਾਲ-ਨਾਲ ਭਾਸ਼ਾ ਦੇ ਵਿਸ਼ਲੇਸ਼ਣ ਸਬੰਧੀ ਪ੍ਰਮੁਖ ਸਿਧਾਂਤਾਂ ਦਾ ਗਿਆਨ ਪ੍ਰਦਾਨ ਕਰਨਾ ਹੈ ਤਾਂ ਜੋ ਵਿਦਿਆਰਥੀ ਵਿਸ਼ਵ ਭਾਸ਼ਾਵਾਂ ਤੇ ਸਿਧਾਂਤਾਂ ਦੇ ਹਵਾਲੇ ਨਾਲ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸਰੂਪ ਅਤੇ ਅਸਤਿਤਵ ਬਾਰੇ ਗਿਆਨ ਪ੍ਰਾਪਤ ਕਰ ਸਕੇ।
ਕੋ2: ਵਿਦਿਆਰਥੀ ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਦੇ ਵੱਖ-ਵੱਖ ਪਹਿਲੂਆਂ ਬਾਰੇ ਗਿਆਨ ਪ੍ਰਾਪਤ ਕਰਨਗੇ।

ਪੇਪਰ-2 ਸਭਿਅਚਾਰ ਅਤੇ ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ (ਕੋਰ ਕੋਰਸ)

ਕੋ 1: ਇਹ ਕੋਰਸ ਸਭਿਅਚਾਰ ਦੇ ਸਿਧਾਂਤਕ ਸਰੂਪ ਰਾਹੀਂ ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ 'ਤੇ ਰੌਸ਼ਨੀ ਪਾਵੇਗਾ।
ਕੋ2: ਵਿਦਿਆਰਥੀ ਵੱਖ-ਵੱਖ ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ ਦੇ ਪਹਿਲੂਆਂ ਬਾਰੇ ਗਿਆਨ ਪ੍ਰਾਪਤ ਕਰਨਗੇ।

ਪੇਪਰ-3 ਗੁਰਮਤਿ ਕਾਵਿ (ਵਿਕਲਪ-1) (ਚੋਣਵਾਂ ਕੋਰਸ)

ਕੋ: ਗੁਰਮਤਿ ਕਾਵਿ ਦਾ ਵਿਸ਼ਾ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਮੁੱਚੀ ਮਾਨਵਤਾ ਦੀ ਬਿਹਤਰੀ ਲਈ ਜਾਤ, ਧਰਮ, ਨਸਲ, ਲਿੰਗ ਅਤੇ ਖੇਤਰਵਾਦ ਤੋਂ ਉਪਰ ਉਠਕੇ ਉਨ੍ਹਾਂ ਵਿੱਚ ਮਾਨਸਿਕ ਤੇ ਆਤਮਿਕ ਉੱਚਤਾ ਪ੍ਰਦਾਨ ਕਰਦਾ ਹੈ।ਇਸ ਸਮੈਸਟਰ ਵਿੱਚ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਭਾਰਤੀ ਦਰਸ਼ਨ, ਗੁਰਮਤਿ ਸਿਧਾਂਤ, ਕੀਮਤ ਸਿਧਾਂਤ ਅਤੇ ਗੁਰੂ ਗ੍ਰੰਥ ਸਾਹਿਬ ਦੇ ਸਮੁੱਚੇ ਬਾਣੀਕਾਰਾਂ ਦੀ ਬਾਣੀ ਤੋਂ ਜਾਣੂ ਕਰਵਾਇਆ ਜਾਂਦਾ ਹੈ।ਪ੍ਰਮੁਖ ਤੌਰ 'ਤੇ ਚਾਰ ਗੁਰੂ ਸਾਹਿਬਾਨ ਦੀ ਬਾਣੀ ਦੇ ਹਵਾਲੇ ਨਾਲ ਮਾਨਵੀ,ਸਮਾਜਕ ਅਤੇ ਅਧਿਆਤਮਕ ਸਰੋਕਾਰਾਂ ਦਾ ਡੂੰਘਾਈ ਨਾਲ ਅਧਿਐਨ ਕੀਤਾ ਜਾਂਦਾ ਹੈ।

ਪੇਪਰ-4 ਪੰਜਾਬੀ ਵਾਰਤਕ - (ਵਿਕਲਪ-1) (ਚੋਣਵਾਂ ਕੋਰਸ)

ਕੋ: ਵਾਰਤਕ ਸਾਹਿਤ ਹੋਰ ਸਾਹਿਤਕ ਰੂਪ ਨਾਲੋਂ ਬੋਧਿਕਤਾ ਦਾ ਪ੍ਰਗਟਾਵਾ ਵਧੇਰੇ ਕਰਦਾ ਹੈ।ਇਸ ਕੋਰਸ ਵਿੱਚ ਵਿਦਿਆਰਥੀ ਵਾਰਤਕ ਦੇ ਸਿਧਾਂਤਕ ਸਰੂਪ ਅਤੇ ਵਾਰਤਕ ਦੇ ਮੁੱਢਲੇ ਰੂਪਾਂ ਦਾ ਗਿਆਨ ਹਾਸਿਲ ਕਰਦੇ ਹਨ।ਪੁਰਾਤਨ ਅਤੇ ਮੱਧਕਾਲੀ ਵਾਰਤਕ ਜਿਸਦਾ ਆਧੁਨਿਕ ਵਾਰਤਕ ਨਾਲੋਂ ਸਰੂਪਗਤ ਅਤੇ ਸ਼ੈਲੀਗਤ ਵਖਰੇਵਾਂ ਹੈ,ਰਾਹੀਂ ਵਿਦਿਆਰਥੀ ਸਮਾਜਕ ਤੇ ਸਾਹਿਤਕ ਵਿਰੋਧਤਾਵਾਂ ਤੇ ਸਮਾਨਤਾਵਾਂ ਨੂੰ ਸਮਝਣ ਦੇ ਸਮਰੱਥ ਹੁੰਦੇ ਹਨ।ਮੁੱਢਲੇ ਪੰਜਾਬੀ ਵਾਰਤਕਕਾਰਾਂ ਭਾਈ ਵੀਰ ਸਿੰਘ,ਸ਼ਰਧਾ ਰਾਮ ਫ਼ਿਲੋਰੀ ਅਤੇ ਗੁਰਬਖਸ਼ ਸਿੰਘ ਦੀਆਂ ਚੋਣਵੀਆਂ ਵਾਰਤਕ-ਕਿਰਤਾਂ ਰਾਹੀਂ ਇਹ ਕੋਰਸ ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਬੋਧਿਕ ਸੂਝ ਪੈਦਾ ਕਰਨ ਵਿੱਚ ਮਹੱਤਵਪੂਰਨ ਰੋਲ ਅਦਾ ਕਰਦਾ ਹੈ।

ਪੇਪਰ-5 ਸੂਫੀ ਅਤੇ ਬੀਰ ਕਾਵਿ - (ਵਿਕਲਪ-1) (ਚੋਣਵਾਂ ਕੋਰਸ)

ਕੋ: ਪੰਜਾਬੀ ਸੂਫੀ ਅਤੇ ਬੀਰ ਕਾਵਿ ਪਰੰਪਰਾ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੇ ਆਦਿਕਾਲੀਨ ਅਤੇ ਮੱਧਕਾਲੀਨ ਦੌਰ ਦੀ ਮਹੱਤਵਪੂਰਨ ਕਾਵ-ਧਾਰਾ ਹੈ। ਇਹ ਸ਼ਾਇਰੀ ਪੰਜਾਬੀ ਸਾਹਿਤ, ਇਤਿਹਾਸ ਅਤੇ ਸੱਭਿਆਚਾਰ ਦੀ ਗੌਰਵਮਈ ਪੂੰਜੀ ਹੈ। ਪੰਜਾਬੀ ਸੂਫ਼ੀ ਕਵੀਆਂ ਨੇ ਸਾਮੀ ਅਤੇ ਸਨਾਤਨੀ ਮੱਤ ਦੇ ਸਿਧਾਂਤਾਂ ਨੂੰ ਜੋੜਨ ਵਿੱਚ ਇਕ ਕੜੀ ਦਾ ਕਾਰਜ ਕੀਤਾ ਹੈ। ਪੰਜਾਬ, ਪੰਜਾਬੀ ਅਤੇ ਪੰਜਾਬੀਅਤ ਦੇ ਗੂੜ੍ਹੇ ਰੰਗ ਇਸ ਕਾਵਿ ਵਿੱਚੋਂ ਵੇਖੇ ਜਾ ਸਕਦੇ ਹੈ। ਇਸ ਸਾਹਿਤ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਮਾਜ, ਕੁਦਰਤ ਅਤੇ ਮਨੁੱਖਤਾ ਨਾਲ ਜੁੜਨ ਦਾ ਮੌਕਾ ਮਿਲਦਾ ਹੈ। ਸੂਫ਼ੀ ਕਾਵਿ ਵਿੱਚ ਹਰ ਸਮਾਜਿਕ ਪਹਿਲੂ ਦੀ ਚਰਚਾ ਹੁੰਦੀ ਹੈ। ਪੰਜਾਬ ਦੀ ਭੂਗੋਲਿਕ ਸਥਿਤੀ ਨੇ ਪੰਜਾਬੀਆਂ ਵਿੱਚ ਵੀਰਤਾ ਦੇ ਗੁਣਾਂ ਨੂੰ ਜਨਮ ਦਿੱਤਾ ਹੈ।ਪੰਜਾਬੀ ਦੇ ਅਜਿਹੇ ਅਣਖੀਲੇ ਅਤੇ ਜੁਝਾਰੂ ਸੁਭਾਅ ਨੇ ਪੰਜਾਬੀ ਸਾਹਿਤ ਨੂੰ ਵਾਰ ਤੇ ਜੰਗਨਾਮਾ ਕਾਵਿ ਵਰਗਾ ਮਹੱਤਵਪੂਰਨ ਕਾਵਿ ਦਿੱਤਾ।ਇਹ ਕੋਰਸ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਉਹਨਾਂ ਦੇ ਇਤਿਹਾਸਕ ਵਿਰਸੇ ਨਾਲ ਜੋੜਨ ਵਿੱਚ ਮਹੱਤਵਪੂਰਨ ਰੋਲ ਅਦਾ ਕਰਦਾ ਹੈ।

ਸਮੈਸਟਰ- ਚੌਥਾ

ਪੇਪਰ-1 ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ (ਕੋਰ ਕੋਰਸ)

ਕੋ:1 ਇਹ ਕੋਰਸ ਭਾਸ਼ਾਵਾਂ ਦੇ ਗਿਆਨ ਰਾਹੀਂ ਮਾਨਵਤਾ ਦੇ ਇਤਿਹਾਸ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਂਦਾ ਹੈ। ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੇ ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੇ ਸਰੂਪ,ਇਸਦੇ ਇਤਿਹਾਸਕ ਵਿਕਾਸ,ਇਸਦੀ ਵਿਆਕਰਨਿਕ ਵਿਲੱਖਣਤਾ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀਆਂ ਭਾਸ਼ਾਗਤ ਵਿਲੱਖਣਤਾਵਾਂ ਬਾਰੇ ਜਾਣੂ ਕਰਵਾਉਣਾ ਹੈ।ਇਹ ਕੋਰਸ ਭਾਸ਼ਾ ਦੇ ਗਿਆਨ ਦੀ ਭਾਰਤੀ ਦਾਰਸ਼ਨਿਕ ਪਰੰਪਰਾ ਨਾਲ ਵੀ ਵਿਦਿਆਰਥੀ ਨੂੰ ਜੋੜਦਾ ਹੈ।

ਪੇਪਰ-2 ਲੋਕਧਾਰਾ ਅਤੇ ਪੰਜਾਬੀ ਲੋਕਧਾਰਾ (ਕੋਰ ਕੋਰਸ)
ਇਹ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਲੋਕਧਾਰਾ ਦੇ ਸਿਧਾਂਤ,ਲੋਕਧਾਰਾ ਦੀ ਮਾਨਵੀ ਜੀਵਨ-ਜਾਂਚ ਨਾਲ ਸਾਂਝ ਰਾਹੀਂ ਪੰਜਾਬੀ ਲੋਕਧਾਰਾ ਦੇ ਵੱਖ-ਵੱਖ ਪਹਿਲੂਆਂ ਦੀ ਪੜਚੋਲ ਕਰਨ ਦੇ ਸਮਰੱਥ ਬਣਾਉਂਦਾ ਹੈ।

ਪੇਪਰ-3 ਗੁਰਮਤਿ ਕਾਵਿ (ਭਗਤ ਬਾਣੀ ਅਧਿਆਨ ਵਿਕਲਪ-1) (ਚੋਣਵਾਂ ਕੋਰਸ)
ਕੋ: ਗੁਰਮਤਿ ਕਾਵਿ ਦਾ ਵਿਸ਼ਾ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਸਮੁੱਚੀ ਮਾਨਵਤਾ ਦੀ ਬਿਹਤਰੀ ਲਈ ਜਾਤ, ਧਰਮ, ਨਸਲ, ਲਿੰਗ ਅਤੇ ਖੇਤਰਵਾਦ ਤੋਂ ਉਪਰ ਉਠਕੇ ਉਨ੍ਹਾਂ ਨੂੰ ਆਤਮਿਕ ਤੇ ਮਾਨਸਿਕ ਉੱਚਤਾ ਅਤੇ ਸਮਜਕ ਮੁੱਲਾਂ ਲਈ ਪ੍ਰੇਰਿਤ ਕਰਨਾ ਹੈ।ਇਸ ਸਮੈਸਟਰ ਵਿੱਚ ਸ਼੍ਰੀ ਗੁਰੂ ਗ੍ਰੰਥ ਸਾਹਿਬ ਵਿੱਚ ਦਰਜ ਭਗਤ ਸਾਹਿਬਾਨ ਬਾਬਾ ਸ਼ੇਖ ਫਰੀਦ, ਭਗਤ ਨਾਮਦੇਵ, ਭਗਤ ਰਵਿਦਾਸ ਅਤੇ ਭਗਤ ਕਬੀਰ ਜੀ ਦੀ ਸਮੁੱਚੀ ਬਾਣੀ ਰਾਹੀਂ ਸਮਕਾਲੀ ਸਮਾਜ ਵਿੱਚ ਦਰਪੇਸ਼ ਸਮੱਸਿਆਵਾਂ ਅਤੇ ਚੁਣੋਤੀਆਂ ਦੇ ਲਈ ਸੇਧ ਪ੍ਰਦਾਨ ਕਰਨ ਦਾ ਮਹੱਤਵਪੂਰਨ ਸਰੋਤ ਹੈ।

ਪੇਪਰ-4 ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕ (ਵਿਕਲਪ-1) (ਇਲੈਕਟਿਵ ਕੋਰਸ)
ਕੋ: ਵਾਰਤਕ ਸਾਹਿਤ ਹੋਰ ਸਾਹਿਤਕ ਰੂਪ ਨਾਲੋਂ ਬੋਧਿਕਤਾ ਦਾ ਪ੍ਰਗਟਾਵਾ ਵਧੇਰੇ ਕਰਦਾ ਹੈ।ਇਸ ਕੋਰਸ ਵਿੱਚ ਵਿਦਿਆਰਥੀ ਵਾਰਤਕ ਦੇ ਸਿਧਾਂਤਕ ਸਰੂਪ ਅਤੇ ਪੰਜਾਬੀ ਵਾਰਤਕ ਦੇ ਆਧੁਨਿਕ ਰੂਪਾਂ ਦਾ ਗਿਆਨ ਹਾਸਿਲ ਕਰਦੇ ਹਨ।ਪੁਰਾਤਨ ਅਤੇ ਮੱਧਕਾਲੀ ਵਾਰਤਕ ਜਿਸਦਾ ਆਧੁਨਿਕ ਵਾਰਤਕ ਨਾਲੋਂ ਸਰੂਪਗਤ ਅਤੇ ਸ਼ੈਲੀਗਤ ਵਖਰੇਵਾਂ ਹੈ,ਰਾਹੀਂ ਵਿਦਿਆਰਥੀ ਸਮਾਜਕ ਤੇ ਸਾਹਿਤਕ ਵਿਰੋਧਤਾਵਾਂ ਤੇ ਸਮਾਨਤਾਵਾਂ ਨੂੰ ਸਮਝਣ ਦੇ ਸਮਰੱਥ ਹੁੰਦੇ ਹਨ।ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਵਾਰਤਕਕਾਰਾਂ ਦੀਆਂ ਚੋਣਵੀਆਂ ਵਾਰਤਕ-ਕਿਰਤਾਂ ਰਾਹੀਂ ਇਹ ਕੋਰਸ ਵਿਦਿਆਰਥੀਆਂ ਵਿੱਚ ਬੋਧਿਕ ਸੂਝ ਪੈਦਾ ਕਰਨ ਵਿੱਚ ਮਹੱਤਵਪੂਰਨ ਰੋਲ ਅਦਾ ਕਰਦਾ ਹੈ।

ਪੇਪਰ-5 ਕਿੱਸਾ ਕਾਵਿ (ਵਿਕਲਪ-1) (ਚੋਣਵਾਂ ਕੋਰਸ)
ਕੋ:1 ਇਹ ਕਾਵਿ-ਧਾਰਾ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੇ ਮੱਧਕਾਲੀ ਕਾਵਿ-ਰੂਪਾਂ ਨੂੰ ਨਵਾਂ ਸੁਭਾਅ ਅਤੇ ਸਰੂਪ ਪ੍ਰਦਾਨ ਕਰਦੀ ਹੈ।
ਇਹ ਕਾਵਿ-ਧਾਰਾ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਜਿਥੇ ਸਮਾਜਕ ਮੁੱਲਾਂ ਪ੍ਰਤੀ ਚੇਤੰਨ ਹੋਣ ਲਈ ਪ੍ਰੇਰਦੀ ਹੈ,ਉਥੇ ਪੰਜਾਬੀ ਸਮਾਜ ਅਤੇ ਸੱਭਿਆਚਾਰ ਦੇ ਡੂੰਘੇ ਵਿਸ਼ਲੇਸ਼ਣ ਲਈ ਦ੍ਰਿਸ਼ਟੀ ਅਤੇ ਪ੍ਰਤਿਭਾ ਪੈਦਾ ਕਰਦੀ ਹੈ।

ਮੁਖੀ
ਪੰਜਾਬੀ ਵਿਭਾਗ
ਗੁਰੂ ਨਾਨਕ ਕਾਲਜ
ਬੁਢਲਾਡਾ (ਮਾਨਸਾ)

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