

DESH BHAGAT COLLEGE BARDWAL-DHURI

(Affiliated to Punjabi University, Patiala, approved by NCTE, Accredited by NAAC "B" Grade)



PG DEPARTMENT OF COMPUTER SCIENCE & IT

Session 2018-2019

Specific Programme Outcomes – On completion of B.C.A., PGDCA, M. Sc IT – (Regular) and M. Sc. IT – (LE) degrees the graduates and post graduate will be able to:

- Apply standard Software Application / Engineering practices and strategies in real-time software project development using open-source programming environment or commercial environment to deliver quality product for the organization success.
- Design and develop computer programs / computer-based systems in the areas related to algorithms, coding, networking, web design, cloud computing, information technology and data analytics of varying complexity.
- Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

Programme Outcomes are as:

- ✓ **Problem analysis:** Identify, formulate and analyze complex computer application problems reaching substantiated conclusions using first principles of programming, coding, designing, research methodology, and modern technology of computer sciences.
- ✓ **Design / development of solutions:** Design solutions for complex technical problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- ✓ **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- ✓ **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex technical activities with an understanding of the limitations.

- ✓ **The technology and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- ✓ **Environment and sustainability:** Understand the impact of the professional technology solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- ✓ **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- ✓ **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- ✓ **Communication:** Communicate effectively on complex technical activities with the technical community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- ✓ **Project management and finance:** Demonstrate knowledge and understanding of the technical and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- ✓ **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

The Objectives of Computer Application are:-

- I. The Information Technology prepares a student for basic knowledge using computer to solve data processing problems in daily life.
- II. The Computer Studies is designed for students to understand and operate the computer and have special emphasis on sound design principles and programming development.
- III. The aims of Computer Application is to provide the students with an opportunity to develop understanding of the basic operations of a computer system and computer applications software.
- IV. They also develop the skill of using computer applications software for solving problems.
- V. They appreciate the social implications of developments in information technology.

COURSE OUTCOME

BACHELOR OF COMPUTER APPLICATION: (B. C. A. – Three Year Course)

Students will be able to recognize & appreciate the role of computing in a wide variety of activities & application of Modern society, including education, communication. Analyze a given problem and develop an algorithm to solve the problem. Demonstrate the basic technicalities of creating word document, creating power point presentation, design spreadsheet for office use. Develop the software projects by understanding the client requirement. Define fundamental account concept, conventions & terminologies. Implement the various programming languages like C, C++, DBMS, Java, Computer Networks, software design, coding techniques and software testing principle. Students will be able to know various issues, latest trends in technology development and thereby innovate new ideas and solutions to existing problems.

General Education

No.	Name of Course	Description of Course outcome
CO-01	Fundamentals of Information Technology & Its Practical Software Lab-I	The Students after completing course will be able to: Understand basic computer hardware architecture and design fundamental logic circuits. Conversion of different number systems and describe some different codes. Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components. Understand the role of CPU and its components. Learn essential IT support skills including installing, configuring, securing and troubleshooting operating systems and hardware. Gain hands-on experience of working in Microsoft products such as: MS Word, MS Excel and MS PowerPoint.
CO-02	Programming Fundamentals Using C & Its Practical Software Lab- II	The Students after completing course will be able to: Develop logics to create the programs in C. Also learning the basic programming concepts they can easily switch over to any other language in future. Learning Outcomes: After the completion of this course, the student can develop application. Understand the basic terminology used in computer programming, writing, compiling and debugging involving decision structures, loops and functions, arrays, strings and pointers, union, file handling.

CO-03	Digital Electronics	<p>The Students after completing course will be able to: Digital Electronics is the study of electronic circuits that are used to process and control digital signals. In contrast to analog electronics, where information is represented by a continuously varying voltage, digital signals are represented by two discrete voltages or logic levels. This distinction allows for greater signal speed and storage capabilities and has revolutionized the world electronics. Digital electronics is the foundation of all modern electronic devices such as cellular phones, MP3 players, laptop computers, digital cameras, high definition televisions, etc.</p>
CO-04	Data Structures & Its Practical Software Lab- III	<p>The Students after completing course will be able to: Have a comprehensive knowledge of the data structures and algorithms on which file structures and data bases are based. Understand the importance of data and be able to identify the data requirements for an application. Have an understanding and practical experience of algorithmic design and implementation. Have practical experience of developing applications that utilize databases. Understand the issues involved in algorithm complexity and performance.</p>
CO-05	Computer System Organization and Architecture	<p>The Students after completing course will be able to: Computer organization and architecture: instruction formats and construction; addressing modes; memory hierarchy (cache, main memory and secondary memory) operation and performance; simple pipelines; basic performance analysis; simple OS functions, particularly as they relate to hardware; virtual memory; computer I/O concepts, including interrupt and DMA mechanisms; inter computer communication concepts.</p>
CO-06	Object Oriented Programming Using C++ & Its Practical Software Lab-IV	<p>The Students after completing course will be able to: Explain object-oriented concepts and describe how they are supported by C++ including identifying the features and peculiarities of the C++ programming language. Use C++ to</p>

		demonstrate practical experience in developing object-oriented solutions. Design and implement programs using C++. Analyze a problem description, design and build object-oriented software using good coding practices and techniques. Implement an achievable practical application and analyze issues related to object-oriented techniques in the C++ programming language.
CO-07	Fundamentals of Database Management System & Its Practical Software Lab-V	The Students after completing course will be able to: Understand the current theory and practice of database management system. These include data independence, data constraints procedure, integrity, security, recovery, database design and database administration and conceptual data models. Implement a relational database into a database management system.
CO-08	Computer Networks	The Students after completing course will be able to: Learn the need to create a Network. Learn about different layers and protocols present in those layers. Learn to configure the network devices. Learn about IP -Addressing. Learn about Network Security.
CO-09	Management Information System	The Students after completing course will be able to: Understand the concepts of user, system, functional and non-functional requirements and will be able to explain how software requirement may be organized in a requirements document.
CO-10	Relational Database Management Systems with Oracle & Its Practical Software Lab-VII	The Students after completing course will be able to: Understand the current theory and practice of database management system. These include data independence, data constraints procedure, integrity, security, recovery, database design and database administration and conceptual data models. Implement a relational database into a database management system. Become proficient in using database query language, i.e., Microsoft Office Access, My SQL.

CO-11	System Analysis and Design	The Students after completing course will be able to: Develop skills of system analysis and design. It includes expanded coverage of data flow diagrams, data dictionary, and process specifications.
CO-12	System Software	The Students after completing course will be able to: Understand the concepts of user, system, functional and non-functional requirements and will be able to explain how software requirement may be organized in a requirements document.
CO-13	Java Programming & Its Practical Software Lab-IX	The Students after completing course will be able to: Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism encapsulation and overloading. Identify classes, objects, members of a class and the relationships among them needed for a specific problem. Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling). Use testing and debugging tools to automatically discover errors of Java programs as well as use versioning tools for collaborative programming/editing. Develop programs using the Java Collection API as well as the Java standard class library.
CO-14	Web Designing using HTML and DHTML & Its Practical Software Lab-X	The Students after completing course will be able to: The course introduces students to basic web design using HTML (Hypertext Markup Language), DHTML (Dynamic Hypertext Markup Language) and CSS (Cascading Style Sheets). The course does not require any prior knowledge of HTML or web design. The course is designed to teach the participants how to create web documents using HTML that comprises the best practices of webpage design through the use of CSS, DHTML and XML.

CO-15	E-Commerce	The Students after completing course will be able to: to focuses on principles of e-commerce from a business perspective, providing an overview of business and technology topics, business models, virtual value chains and social innovation and marketing strategies. Students will build their own web presence and market it using an online platform.
CO-16	Operating Systems	The Students after completing course will be able to: Gain extensive knowledge on principles and modules of operating systems. Understand key mechanisms in design of operating systems modules. Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks. Compare performance of processor scheduling algorithms - produce algorithmic solutions to process synchronization problems. Use modern operating system calls such as Linux process and practice with operating system concepts such as process management, synchronization, networked processes and file systems.
CO-17	Software Engineering	Know about the software product and process. Know about software characteristics, components and applications, methods and tools. Understand the software development paradigms. The software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction and deployment.
CO-18	Web Designing using ASP.NET and Its Practical Software Lab - XII	At the end of the course the participant will create a Web form with server controls. Separate page code from content by using code-behind pages, page controls, and components. Display dynamic data from a data source by using Microsoft ADO.NET and data binding. Debug ASP.NET pages by using trace.
CO-19	Computer Applications in Business	Students will learn to solve business problems using computer software, manage data to make data-driven decisions using statistical ideas.

COURSE OUTCOME

POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS: (PGDCA)

It will equip the students with skills required for designing, developing applications in Information Technology. Students will be able to learn the latest trends in various subjects of computers & information technology. The PG Diploma aims at graduates with a computing background and provides a detailed coverage of the key concepts and challenges in data and resource protection and computer software security. To give hands on to students while developing real life IT application as part of the study. To train graduate students in basic computer technology concepts and information technology applications. Design and develop applications to analyze and solve all computer science related problems.

General Education

No.	Name of Course	Description of Course outcome
CO-1	Fundamentals of Information Technology & Its Practical Software Lab - I	The Students after completing course will be able to: Understand basic computer hardware architecture and be able to design fundamental logic circuits. Convert between different number systems and describe some different codes. Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components. Understand the role of CPU and its components. Learn essential IT support skills including installing, configuring, securing and troubleshooting operating systems and hardware. Gain hands-on experience of working in Microsoft products such as: MS Word, MS Excel and MS PowerPoint.
CO-2	Operating Systems	The Students after completing course will be able to: Gain extensive knowledge on principles and modules of operating systems. Understand key mechanisms in design of operating systems modules. Understand process management, concurrent processes and

		threads, memory management, virtual memory concepts, deadlocks. Compare performance of processor scheduling algorithms - produce algorithmic solutions to process synchronization problems. Use modern operating system calls such as Linux process and practice with operating system concepts such as process management, synchronization, networked processes and file systems.
CO-3	Problem Solving using C & Its Practical Software Lab- II	The Students after completing course will be able to : Develop logics to create the programs in C. Also learning the basic programming constructs they can easily switch over to any other language in future. Learning Outcomes: After the completion of this course, the student will be able to develop application. Understand the basic terminology used in computer programming, writing, compiling and debugging involving decision structures, loops and functions, arrays, strings and pointers, union, file handling.
CO-4	Database Management System & Its Practical Software Lab-III	The Students after completing course will be able to: Understand the current theory and practice of database management systems. These include data independence, Data constraints, procedure, integrity, security, recovery, database design and database administration and conceptual data models. Become proficient in using database query language, i.e., Microsoft Office Access, My SQL.

CO-5	Introduction to Computer Network, Internet and E-Commerce	<p>The Students after completing course will be able to:</p> <p>Have a basic knowledge of the use of cryptography and network security. Specify and identify deficiencies in existing protocols and better protocols. Have an understanding of the issues surrounding Mobile and Wireless Networks. The need for Computer Security, Security Strategies, Security Tools, Encryption, Enterprise Networking and Access to the Internet, Antivirus Programs, Security Teams. Define and differentiate various types of Ecommerce. Describe Hardware and Software Technologies for Ecommerce. Explain payment systems for E - commerce. Describe the process of Selling and Marketing on web.</p>
CO-6	Object Oriented Programming Using C++ & Its Practical Software Lab-IV	<p>The Students after completing course will be able to:</p> <p>Explain object-oriented concepts and describe how they are supported by C++ including identifying the features and peculiarities of the C++ programming language. Use C++ to demonstrate practical experience in developing object-oriented solutions. Design and implement programs using C++. Analyze a problem description, design and build object-oriented software using good coding practices and techniques. Implement an achievable practical application and analyze issues related to object-oriented techniques in the C++ programming language.</p>

COURSE OUTCOME

M. Sc. IT – (Information Technology) Regular & Lateral Entry

To provide technology students with the knowledge and ability to students develop creative solutions. Develop skills to learn new technology. Apply computer science theory and software development concepts to construct computing-based solutions. Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, Artificial Intelligence, Mobile applications. Be able to understand the role of Computer Science in solving real time problems in society. Know the recent developments IT, future possibilities and limitations, and understand the value of lifelong learning.

General Education

No.	Name of Course	Description of Course outcome
CO-1	Introduction to Information Technology	The Students after completing course will be able to: Understand basic computer hardware architecture and be able to design fundamental logic circuits. Convert between different number systems and describe some different codes. Understand the fundamental hardware components that make up a computer's hardware and the role of each of these components. Understand the role of CPU and its components. Learn essential IT support skills including installing, configuring, securing and troubleshooting operating systems and hardware. Gain hands-on experience of working in Microsoft products such as: MS Word, MS Excel and MS PowerPoint.
CO-2	Computer Programming using C & Its Practical Software Lab - I	The Students after completing course will be able to: Develop logics to create the programs in C. Also learning the basic programming constructs they can easily switch over to any other language in future.

		<p>Learning Outcomes: After the completion of this course, the student will develop application. Understand the basic terminology used in computer programming, writing, compiling and debugging involving decision structures , loops and functions, arrays, strings and pointers, union, file handling.</p>
CO-3	Computer Organization and Architecture	<p>The Students after completing course will be able to understand Computer organization and architecture: instruction formats and construction; addressing modes; memory hierarchy (cache, main memory and secondary memory) operation and performance; simple pipelines; basic performance analysis; simple OS functions, particularly as they relate to hardware; virtual memory; computer I/O concepts, including interrupt and DMA mechanisms; inter computer communication concepts.</p>
CO-4	Operating Systems	<p>The Students after completing course will be able to: Gain extensive knowledge on principles and modules of operating systems. Understand key mechanisms in design of operating systems modules. Understand process management, concurrent processes and threads, memory management, virtual memory concepts, deadlocks. Compare performance of processor scheduling algorithms - produce algorithmic solutions to process synchronization problems. Use modern operating system calls such as Linux process and practice with operating system concepts such as process management, synchronization, networked processes and file systems.</p>

CO-5	Object Oriented Programming Using C++ & Its Practical Software Lab - II	<p>The Students after completing course will be able to: Explain object-oriented concepts and describe how they are supported by C++ including identifying the features and peculiarities of the C++ programming language. Use C++ to demonstrate practical experience in developing object-oriented solutions. Design and implement programs using C++. Analyze a problem description, design and build object-oriented software using good coding practices and techniques. Implement an achievable practical application and analyze issues related to object-oriented techniques in the C++ programming language.</p>
CO-6	Data and File Structures	<p>The Students after completing course will be able to: Have a comprehensive knowledge of the data structures and algorithms on which file structures and data bases are based. Understand the importance of data and be able to identify the data requirements for an application. Have an understanding and practical experience of algorithmic design and implementation. Have practical experience of developing applications that utilize databases. Understand the issues involved in algorithm complexity and performance.</p>
CO-7	Visual Basic & Its Practical Software Lab - III	<p>The Students after completing course will be able to: Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)</p>

		<p>Develop a Graphical User Interface (GUI) based on problem description. Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events. Develop an Algorithm to verify processing is accurate. Develop and debug applications using Visual Basic 2010 (or version required for the course) that runs under Windows operating system Develop programs that retrieve input from a file as opposed to input only provided by user.</p>
CO-8	RDBMS and Oracle & Its Practical Software Lab - III	<p>The Students after completing course will be able to: understand the current theory and practice of database management system. These include data independence, data constraints procedure, integrity, security, recovery, database design and database administration and conceptual data models. Implement a relational database into a database management system. Become proficient in using database query language, i.e., Microsoft Office Access, My SQL.</p>
CO-9	Web Technology & Its Practical Software Lab - IV	<p>The Students after completing course will be able to: Develop web application using server side and client side PHP programming and Database connectivity using My SQL.</p>

CO-10	Java Programming & Its Practical Software Lab - V	<p>The Students after completing course will be able to: Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading. Identify classes, objects, members of a class and the relationships among them needed for a specific problem. Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling). Use testing and debugging tools to automatically discover errors of Java programs as well as use versioning tools for collaborative programming/editing. Develop programs using the Java Collection API as well as the Java standard class library.</p>
CO-11	Software Engineering	<p>The Students after completing course will be able to: Apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction and deployment.</p>
CO-12	Computer Network	<p>The Students after completing course will be able to: Learn the need to create a Network. Learn about different layers and protocols present in those layers. Learn to configure the network devices. Learn about IP -Addressing. Learn about Network Security.</p>

CO-13	Computer Graphics & Its Practical Software Lab - VI	<p>The Students after completing course will be able to: Provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations. To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations. To implement various graphics drawing algorithms, 2D-3D transformations and clipping techniques. To implement depth calculations and algorithms to find lines and surfaces algorithms. To implement surface rendering and illumination models.</p>
CO-14	Linux Administration & Its Practical Software Lab - VII	<p>The Students after completing course will be able to: Learn how to install, configure and maintain an Enterprise Linux system in a networked environment, Creating and maintaining system users and groups, Understanding and administering file permissions on directories and regular files.</p>
CO-15	Research Methodology	<p>The Students after completing course will be able to: Research proposal and its elements, Formulation of research problem: criteria of sources and definition, Development of objectives and characteristics of objectives, Development hypothesis and applications. Types of Reports, Planning of Report Writing, Research Report Format, Principles of Writing, Documentation, Data and Data Analysis reporting in a Thesis, Writing of Report, Typing of Report, Briefing. Case study formats of research proposal writing.</p>

CO-16	Artificial Intelligence	The Students after completing course will be able to: Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents. Apply concept Natural Language processing to problems leading to understanding human communication computing, Decision making, problem solving, perception, understanding human communication.
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Prof. Amrit Singh Madahar

Head

PG Department of Computer Science & IT
Desh Bhagat College Bardwal Dhuri – Sgr

Series	Name of the Course	Description of Course Outcome	Help in/ Application
CO1	Physical Geography "Geomorphology"	That regarding lithosphere of the earth/ regarding solid parts ie Rock, Minerals, Metal structure of the earth, earth rotation, River, glacin, slopeother related ports, sonimic Zone, Volcano etc.	Dam, Road, Airport, Building sky scrapper
CO2	Physical Geography "Climatology"	That regarding Atmosphere in general and climate, its content Temp., Humidity, Winds, Rain, Stooms, toonando, Hurricane, Masses Climatic zone, Daya Hight, Season Climate, weather forecasting in general.	Weather forecasting rocket/ Missle Technology
CO3	Resources Geography, Utilization Environment	All types of resources in the world, their exploitation, impact on environment, human resource, their number, distribution, intotally whole natural wealth a it dependent relation loads to Ecological imbalance	Help to make Eco Policy, budy earth summit to make the world safe for
CO4	Geography of Punjab	A microlevel study of the state about its resources, people, manufacturer, climate, Soil about its people, culture, regional devision	To make policy about the people who have and havn't
CO5	Regional Geography of (N.E.S. America's Ecrope)	A brief study of Resource, Human, Physical setting automobile, Mineral of human population Trade to make balance growth	To make people safe the planet habitable
CO6	Regional Geography of (Asia, Africas' Oceans)	A brief study of Resource, Human, Physical setting automobile, Mineral of human population Trade to make balance growth	To make people safe the planet habitable

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DEPARTMENT OF CHEMISTRY

NAME OF PROGRAMME: B.Sc (N.M)

NAME OF COURSE: CHEMISTRY

NAME OF FACULTY: NAVPREET KAUR

PROGRAM PURPOSE

The purpose of undergraduate chemistry program at Desh Bhagat College Bardwal-Dhuri is to provide the comprehension base and laboratory resources to prepare students for careers as professionals in the field of chemistry, for graduate study in chemistry and relevant fields, and for professional school including medical, dental, law and business programs.

B.Sc. CHEMISTRY -- PROGRAMME STRUCTURE

Sem	Paper	Title of the course	Period /week	Marks		Total
				Paper Asstt.	Int.	
I	I	Inorganic chemistry	3	26	09	35
	II	Organic chemistry	3	26	09	35
	III	Physical chemistry	3	26	09	35
	I	Practical chemistry -I	6	45	—	45
II	I	Inorganic chemistry	3	26	09	35
	II	Organic chemistry	3	26	09	35
	III	Physical chemistry	3	26	09	35
	II	Practical chemistry - II	6	45	—	45
III	I	Inorganic chemistry	3	26	09	35
	II	Organic chemistry	3	26	09	35
	III	Physical chemistry	3	26	09	35
	I	Practical chemistry -I	6	45	---	45

IV	I	Inorganic chemistry	3	26	09	35
	II	Organic chemistry	3	26	09	35
	III	Physical chemistry	3	26	09	35
	II	Practical chemistry -II	6	45	---	45
V	I	Inorganic chemistry	3	26	09	35
	II	Organic chemistry	3	26	09	35
	III	Physical chemistry	3	26	09	35
	I	Practical chemistry -I	6	45	---	45
VI	I	Inorganic chemistry	3	26	09	35
	II	Organic chemistry	3	26	09	35
	III	Physical chemistry	3	26	09	35
	II	Practical chemistry -II	6	45	---	45

COURSE OUTCOMES

Graduates from the chemistry degree program will have demonstrated:

- an understanding of major concepts, theoretical principles and experimental findings in chemistry.
- an ability to work effectively in diverse teams in both classroom and laboratory.
- an ability to employ critical thinking and efficient problem-solving skills in the four areas of chemistry [organic, inorganic, physical and analytical]
- the ability to use modern instrumentation for chemical analysis and separation.
- an ability to conduct experiments, analyze data and interpret results, while observing responsible and ethical scientific conduct.
- are able to identify and solve chemical problems and explore new areas of research.
- a familiarity with application of safety and chemical hygiene regulations and practices.
- are able to communicate the results of their work to chemists and non-chemists.
- an ability to gain entry into professional schools, graduate programs or the job market.

GENERAL EDUCATION

C.Os	Name of Course	Description of Course outcome
CO1	Inorganic chemistry	<ul style="list-style-type: none"> ▪ This course covers the brief ideas about atomic structure, properties of periodic table, bonding and structure of noble gases. ▪ Second part of the course cover's the Chemical bonding including VSPER theory, valence bond theory, electronegativity, dipole moments. ▪ students will able to draw and explain the shapes and

		<p>hybridisation of simple organic compounds.</p> <ul style="list-style-type: none"> ▪ It enable the students to draw the MO diagram for both homonuclear and heteronuclear atoms. ▪ Helps to gain the depth knowledge about general properties trend of periodic table both across the periods and along the groups.
CO2	Organic chemistry	<ul style="list-style-type: none"> ▪ Students review the basic principles of structure and chemical bonding as they apply to organic molecules and are introduced to the concepts of organic reactions and their mechanism, nomenclature, stereochemistry. ▪ The systematic chemistry of Alkanes, cyclo alkanes, Alkenes, cycloalkenes, Alkynes and Dienes are discussed. ▪ Students will acquire the knowledge of basic principles and mechanism of organic reaction and able to explain the mechanism of few selected reactions. ▪ Students should be able to predicting geometries of simple compounds.
CO3	Physical chemistry	<ul style="list-style-type: none"> ▪ This course is an introduction to Mathematical concepts, evaluation of analytical data, physical properties and molecular structure, liquid and gaseous state. ▪ Students become familiar with various physical properties like optical activity, polarization, induced dipole moments. ▪ At the completion of course students may able to calculate dipole moment, refractive index of molecules. ▪ Enable to understand and explain the magnetic properties of molecules - paramagnetism, diamagnetism and ferromagnetism.
CO4	Practical chemistry -I	<ul style="list-style-type: none"> ▪ This course covers practical work of inorganic chemistry. ▪ It familiarize the students about semi-micro analysis of Cation and Anion. ▪ The main objective of semi-micro analysis is to enable the students to identify and separate the ions from Groups I, II, III, IV, V and VI. ▪ Students will gain an understanding of how to engage in safe laboratory practices handling laboratory glassware, equipment, and chemical reagents. ▪ Engage in safe laboratory practices handling laboratory equipment and Chemical regents.

CO5	Inorganic chemistry	<ul style="list-style-type: none"> ▪ This course covers the comparative study (including diagonal relationship) of S-block, P-block, Group 13 elements and ionic Solids. ▪ To be able to explain the difference between conductor, semiconductor, insulator. ▪ To understand the periodic law and significance of atomic no and electronic configuration as the basic for periodic classification. ▪ To classify elements into a s,p,d and f blocks and learn their main characteristics.
CO6	Organic chemistry	<ul style="list-style-type: none"> ▪ To know about the concepts of stereochemistry of organic compounds , Aromaticity, Nomenclature, reactions and methods of formation of Alkyl and aryl halides, reactivity order of alkyl halides vs allyl, vinyl and aryl halides. ▪ Understand the difference between various terms - configuration and conformation, relative and absolute configuration. ▪ In stereoisomerism part a student may know the basic idea about conformational and configurational isomers; enantiomers and diastereomers; syn/anti, cis/trans and E/Z designation.
CO7	Physical chemistry	<ul style="list-style-type: none"> ▪ This paper covers the basic idea about thermodynamics and kinetics in chemistry. ▪ In chemical thermodynamics part students may know different thermodynamics terms mainly closed, open and isolated system, heat capacity,enthalpy and their significance ▪ This chapter covers first law of thermodynamics and second law of thermodynamics as well as different terms related to these laws. ▪ By this chapter, students also have come to know how to calculate the bond dissociation energies from thermochemical data. ▪ In chemical kinetics part, students may know the definition of reaction rate, rate law, zero order, first order reaction, second order reaction and half life time. ▪ Here students may gain the knowledge of consecutive and concurrent reaction, kinetics of chain reaction.

CO8	Practical chemistry- II	<ul style="list-style-type: none"> ▪ Experimental practice of qualitative and quantitative analysis. ▪ This course enhances awareness about determination of melting and boiling points for various organic compounds - (Naphthalene, Benzoic acid, urea, succinic acid, Aspirin, m-Dinitrobenzene, Ethanol, cyclohexane, Benzene, Tolune) crystallization, chemical kinetics. ▪ To learn depth knowledge to use the laboratory techniques. ▪ Students will learn how to summarize findings in writing in a clear and concise manner. ▪ How to use the scientific method to create, test, and evaluate a hypothesis. ▪ Engage in safe laboratory practices handling laboratory equipment and Chemical reagents.
CO9	Inorganic chemistry	<ul style="list-style-type: none"> ▪ This course provide the knowledge of the elements of Frist, Second and Third transition series, chemistry of Lanthanide and Actinides elements. ▪ Able to find the similarities and difference between the later actinides and the later lanthanides. ▪ Able to find the oxidation state, coordination number and magnetic behavior. ▪ Basic knowledge about radioactive materials.
CO10	Organic chemistry	<ul style="list-style-type: none"> ▪ This course primarily focus on the classification, nomenclature, methods of formation, physical and Chemical properties, mechanism & synthesis of Alcohols, Phenols, Aldehydes and ketones. ▪ The primary goal of this course is to make students aware of how the reaction proceed and provides the knowledge about their mechanics. ▪ Working through this course, students are expected to apply their knowledge to problem-solve, deduce structures, and synthesize simple organic molecules using the studied reactions. Relationships between organic chemistry and other disciplines are noted. ▪ Improve their theoretical knowledge about Chemical reactions.
CO11	Physical chemistry	<ul style="list-style-type: none"> ▪ This paper covers the basic idea about thermodynamics and kinetics in chemistry. ▪ To understand all the key features of first and second and third law of thermodynamics and utilise the acquire knowledge to derive the various mathematical expression at different conditions of P, V & T. ▪ In chemical equilibrium part students familiar with the principles and important equations of reactions mainly

		<p>Le Chatelier's principle, isochore-Clapeyron equation.</p> <ul style="list-style-type: none"> ▪ Use the expression from thermodynamic data to calculate various terms in numeral portion. ▪ calculate the bond dissociation energies from thermochemical data.
CO12	Practical chemistry -I	<ul style="list-style-type: none"> ▪ Experimental practice of quantitative volumetric analysis. ▪ The objective of the titration is the determination of the concentration or the mass of the minimum formula from the titrated chemical material composing a pure liquid or a solution. ▪ The main objective of volumetric analysis is to determine the amount of a substance in a given sample. ▪ Engage in safe laboratory practices handling laboratory equipment and Chemical reagents. ▪ Upon successful completion students should be able to: <p>Facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.</p>
CO13	Inorganic chemistry	<ul style="list-style-type: none"> ▪ To understand the key features of coordination compounds, including: <ul style="list-style-type: none"> - the variety of structures. - oxidation numbers and electronic configurations. - coordination numbers. - ligands, chelates. - bonding, stability of complexes. ▪ To be able to use Crystal Field Theory to understand the magnetic properties (and in simple terms) of coordination compounds. ▪ To be able to describe the shapes and structures of coordination complexes with coordination numbers ranging from 4 to 12. ▪ To be able to describe the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters from them. ▪ Students become familiar with some applications of coordination compounds.
CO14	Organic chemistry	<ul style="list-style-type: none"> ▪ Students continue their study of organic chemistry by discussing carboxylic acid and its derivatives, ethers and epoxides, organic compounds of nitrogen, oils ,fats and detergents. ▪ Students will understand the concept of organic reactions mechanism.

		<ul style="list-style-type: none"> ▪ Able to recognize the type of organic reactions. ▪ Students acquire the competence to think of chemistry as a sustainable activity.
CO15	Physical chemistry	<ul style="list-style-type: none"> ▪ This course provide the information about phase equilibrium including phase diagram of Water and Sulphur systems, degree of freedom, thermodynamics derivation & applications, electrochemistry. ▪ Students will able to explain the basic definitions and terms in phase diagram. ▪ Able to defines the importance of phase diagram in the field of materials science. ▪ Relates this concept.
CO16	Practical chemistry -II	<ul style="list-style-type: none"> ▪ This course covers the practical work of physical chemistry and quantitative analysis of functional groups in simple organic compounds. ▪ Give a frim knowledge about the detection of elements (N, S and halogens) and functional groups (phenolic, esters, carbohydrates, animes, amides, nitro etc) ▪ Students acquire the basic knowledge of different organic compounds with different functional group. ▪ Students are able to identify the presence various organic compounds with different functional groups. ▪ Engage in safe laboratory practices handling laboratory equipment and Chemical regents.
CO17	Inorganic chemistry	<ul style="list-style-type: none"> ▪ This course is an introduction to modern inorganic chemistry. Topics include Metal-ligand bonding, thermodynamic and kinetics, Magnetic properties and electronic spectra of transition metal complexes. ▪ Apply the knowledge in biochemical reactions. ▪ Able to predicting of simple molecules. ▪ Able to explain and draw the orgel-energy level diagram for d1 and d9 ststes. ▪ Able to calacute the Term symbols, J, L &S.

CO18	Organic chemistry	<ul style="list-style-type: none"> ▪ This course gives the brief introduction about NMR spectroscopy, H NMR, infrared (IR), organometallic and organosulphur compounds. ▪ Students are able to use of nuclear magnetic resonance spectroscopy, mass spectrometry and infrared spectroscopy for organic structure elucidation ▪ Able to discuss the fundamentals of electronic structure and bonding in conjugated and aromatic systems. ▪ Able to explain reactivity patterns of conjugated and aromatic molecules. ▪ Students understand the phenomenon of the fundamental electronic structure and bonding in carbonyl compounds.
CO19	Physical chemistry	<ul style="list-style-type: none"> ▪ This course emphasize on spectroscopy including - vibrational and rotational spectrum and elementary quantum mechanics. ▪ Understanding of various fundamental laws. ▪ Able to generalize the concept of Schrodinger wave equation.
CO20	<ul style="list-style-type: none"> ▪ Practical chemistry -I 	<ul style="list-style-type: none"> ▪ This course covers the synthesis or preparation of organic compounds-(sodium trioxalatoferate. Ni-DMG complex, copper tetra-ammine complex). ▪ By the end of this course, students should be able to Handle organic chemicals in a safe and competent manner. ▪ Perform the standard techniques used in practical organic chemistry. Carry out an organic preparation following a prescribed procedure. Read and explain the information labels on chemical bottles. ▪ Engage in safe laboratory practices handling laboratory equipment and Chemical reagents. ▪ Students gain the understanding of how to perform common laboratory techniques, including filtration, vacuum filtration, crystallization, recrystallization.
CO21	Inorganic chemistry	<ul style="list-style-type: none"> ▪ This course is aimed to provide the students with a solid understanding of all the fundamental concepts and physical principles in modern inorganic chemistry necessary for the study of the more advanced or specialized courses that follow. ▪ The topics discussed include coordination chemistry, organometallics chemistry, bioinorganic chemistry and material chemistry. ▪ To study about the concepts of biochemical and material chemistry.
CO22	Organic chemistry	<ul style="list-style-type: none"> ▪ Students also explore the chemistry of various organic compounds found in biological systems: carbohydrates,

		<p>amino acids, proteins and peptides, and nucleic acids.</p> <ul style="list-style-type: none"> ▪ From the reaction mechanism chapter, it comprises the ideas of mechanism of electrophilic aromatic substitution and nucleophilic aromatic substitution.
CO23	Physical chemistry	<ul style="list-style-type: none"> ▪ This course including photochemistry, Solid state, Electronic and Raman spectrum. ▪ Here students may gain the knowledge of theory of photochemistry, typical photoreactions. ▪ Students acquire the qualitative description of sigma, pi, and n molecular orbital and their energy levels. ▪ Enable to get the brief knowledge about principles of photochemistry.
CO24	Practical chemistry -II	<ul style="list-style-type: none"> ▪ This course provides the knowledge of stereochemical study of organic compounds as well as the experimental work of physical chemistry. ▪ Engage in safe laboratory practices handling laboratory equipment and Chemical reagents. ▪ By the end of this course students will gain an understanding of : <ul style="list-style-type: none"> ❖ How to calculate a limiting reagent yield, and percent yield. ❖ How to maintain a detailed scientific notebook. ❖ How to critically evaluate data collected to determine the identity, purity, and yield of products. ❖ How to perform common laboratory techniques, including distillation, steam distillation, recrystallization, vacuum filtration, aqueous extraction, thin layer chromatography, column chromatography.

SKILL COMPONENTS

At the completion of B.Sc in chemistry the students are able to :

- ✓ After completion of degree, students gained the theoretical as well as practical knowledge of handling chemicals.
- ✓ They expand the knowledge available opportunities related to chemistry in government services through public commission particularly in the field of Food safety, Health inspector pharmacist etc.
- ✓ Achieve the skills required to succeed in graduate school, professional school and chemical industry like Cement industries, Agro product, Paint industries, Rubber industries, Petrochemical industries, Food processing industries, Fertilizer industries etc

- ✓ Understand the importance of the elements in the periodic table including their physical and Chemical nature and role in the daily life.
- ✓ Got exposures of a breadth of experimental techniques using modern instrumentation.
- ✓ Understand the concept of chemistry to inter relate and interact to the other subject like Mathematics, physics, biological science etc.
- ✓ Learn the laboratory skills and safety to transfer and interpret knowledge entirely in the working environment.

DESH BHAGAT COLLEGE BARDWAL-DHURI

(Affiliated to Punjabi University, Patiala, approved by NCTE, Accredited by NAAC "B" Grade)



DEPARTMENT OF B.SC(N.M)

Programme outcome:

B.Sc also known as Bachelor of Science, is one of the most popular courses amongst science and research enthusiasts. The duration of the course is 3 years and the curriculum comprises various subjects related to the field of study that the student has opted for. The curriculum of B.Sc. comprises theory as well as practical knowledge enabling the student to get an all-round science.

Physics :-

Physics is the branch of science that deals with the structure of matter and how the fundamental constituents of the universe interact. It studies objects ranging from the very small using quantum mechanics to the entire universe using general relativity.

Physics is a natural science that involves the study of matters and its motion through space and time, along with related concepts such as energy and force. More broadly, it universe behaves.

GENERAL EDUCATION

C.O.s Name of Course Description of Course outcomes

C.O.s	Name of Course	Description of Course outcomes
c.o1	Optics	To provide the knowledge of behavior of light
C.O.2	Electronics	To motivate the students to apply the principles of electronics in their day to day life, it deals with both analog and digital signals.
C.O.3	Nuclear physics	To acquire the knowledge and apply it to study the structure of nucleus. know the formation of nucleus and their binding energy. to motivate the students and analyze the energy released by the nucleus during the fission and fusion process.
C.O.4	Quantum mechanics	To motivate the students to apply schrodinger wave equation or solving problems in wave and nuclear physics
C.O.5	Mechanics	The concept of central force system and application of variational principle to solve different problems in mechanics will be learnt.
C.O.6	Laser	Knowledge about laser, optical fibers and their application will be acquired by the students.
C.O.7	Electricity and magnetism	Electromagnetism is a branch of physical science that describes the interactions of electricity and magnetism
C.O8	Statistical physics and thermodynamics	Statistical mechanics, one of the pillars of modern physics, describes how macroscopic parameters that fluctuate around an average
C.O9	Condensed matter physics	Condensed matter physics is the study of substances in their solid state. this includes the investigation of both crystalline solids in which atoms are positioned on a repeating three dimensional lattice, such as diamond and amorphous materials in which atomic position is more irregular like in glass

Skills :-

1. Research skills
2. Problem solving
3. Effectively research organize and arrange information and develop new ideas .
4. Ability to perform calculations
5. Ability to conduct experiments
6. Ability to develop theories
7. Ability to prepare technical reports
8. Knowledge of mathematical modeling

Programme Outcome

B.A. B.Ed. Integrated is a four-year undergraduate programme that offers a dual degree. The programme is designed according to NCTE guidelines to prepare qualitative future teachers for nation-building. The programme was started with a vision to impart in-depth knowledge of different subjects of Humanities including Political Science, History, Geography, Economics, Sociology, Mathematics, Psychology as well as English, Hindi, Punjabi languages and Education in this programme. The B.A. B.Ed graduates become eligible for teaching in upper primary and secondary Govt. and Private/Public schools. They can also work as Content Developers with various educational organizations and publishing houses. The Programme makes them capable of working as Academic Coordinators and Supervisors. Besides this, with a strong and extensive professional training, these graduates can open, establish and manage their own schools. B.A. B.Ed. graduates have a choice of different PG courses like M.Ed., PG Diploma (Teacher Training) courses and MA.

Programme Specific Outcome

The BA B Ed. Programme is a professional course. The BA B.Ed. curriculum facilitates all round development of pupil teachers. The specific programme outcomes can be listed as follows:

- Appreciate the role of teacher in prevailing socio-cultural, Economic and Political Systems in general and education system in particular.
- To build the right attitude, values needed for teaching profession.
- Practice skills and approaches for enhancing understanding of subject matter knowledge to be taught in secondary schools (Science, Mathematics Social Science, English, Hindi, Punjabi languages).
- Analyze the secondary school curriculum of various Schools affiliated to different Boards.
- To develop teachers who are professionally equipped with skills and competencies for changing technological needs.
- To develop Social awareness and skills in pupil teachers who can be leaders and agents of social change and transformation in society.

DETAILS OF COURSES AND COURSE OUTCOMES

C.O. NO.	NAME OF COURSE	DESCRIPTION OF COUSE OUTCOME
CO1:	Psychological Perspective in Education	<ul style="list-style-type: none"> • Understand the learner and his abilities. • Understand the process of human development with special reference to adolescence. • Familiarize with administration and interpretation of Psychological tests. • Apply the understanding of the different type of learners in various classroom situations.
CO2	Philosophical Perspective in Education	<ul style="list-style-type: none"> • Understand concepts and principles of foundations of education. • Apply theories, ideas and generalization of educational foundations. • Express and discuss philosophies and social concepts precisely and rationally. • Analyze different views and schools of thoughts on education and draw generalization.
CO3	Educational Policy and Planning in Contemporary India.	<ul style="list-style-type: none"> • Understand the education policy and its determinants. • Identify and apply various approaches of educational planning • Analyze the functioning of administrative bodies. • Critically analyze recent education policies.

CO4	School Management	<ul style="list-style-type: none"> • Understand the concept and importance of school management. • Understand the concept of time table and co-curricular activities. • Understand the role of worthy head masters and teachers. • Understand the roles of students' self-government.
CO5	Library Resources and Art in Education	<ul style="list-style-type: none"> • Understand the basic principles of library science and develop library ethics. • Enhance artistic and aesthetic sensibility among learners to enable them to respond to the beauty in different Art forms, through genuine exploration, experience and free expression. • Enhance skills for integrating different Art forms across school curriculum at secondary level.
CO6	Teaching Learning Process	<ul style="list-style-type: none"> • Explain the nature and characteristics of teaching. • Describe the principles and maxims of teaching. • Discuss anatomy of teaching. • Differentiate between teaching and learning. • Understand the role of teacher Motivating, strengthening and sustaining learning styles.
CO7	Sociological Perspective in Education	<ul style="list-style-type: none"> • Understand the concept of education from a sociological perspective. • Analyze social stratification in Indian society. • Inculcate human values among the learners. • Be an agent of change for removal of various types of disparities.

CO8	Curriculum Development	<ul style="list-style-type: none"> • Understand the need and importance of curriculum. • Analyze different issues in curriculum. • Apply different approaches to curriculum construction. • Able to construct curriculum for children with special needs.
CO9	Experiential learning	<ul style="list-style-type: none"> • Develop insight on indigenous models of experiential learning. • Understand and practice models of Indian philosophers for societal reconstruction. • Promote respect for diversity, leadership and social justice. • Identify pedagogical practices for effective implementation of curriculum strategies.
CO10	Enriching Learning through ICT	<ul style="list-style-type: none"> • Understand the role and importance of ICT in teaching-learning process and Integration of ICT in teaching learning process. • Employ hands-on-experience on computer. • Use different multimedia and on-line resources in teaching-learning process. • Familiarize with the new trends in ICT.
CO11	Pedagogy of Social Sciences, History ,Political Science and Geography.	<ul style="list-style-type: none"> • Develop an understanding of aims and objectives of teaching social studies. History, Political Science and Geography. • Acquire skills to inculcate national and international values through Social Science, History, Political Science and Geography. • Develop skills of making teaching learning process experiential and joyful.

CO12	Pedagogy of Physical Education	<ul style="list-style-type: none"> • Develop an understanding of objectives and importance of teaching of Physical Education in schools. • Know the relationship of Physical Education with other subjects. • Understand the importance of Physical Education room, equipment and text book. Bring the overall awareness of values and to inculcate among students the desired habits and attitude towards Physical Education. • Develop an awareness regarding the importance of Physical Fitness and organic efficiency in individual and social life.
CO13	Pedagogy of languages	<ul style="list-style-type: none"> • Develop an understanding of nature of language system and methods of teaching language. • Identify the organs of speech and recognize the vowel sounds in particular language. • Appreciate the various perspectives that have their bearing on the emergence and evolution of Languages as a discipline. • Understand the inter-link between Languages as a disciplines and as a school Subject
CO14	Pedagogy of Mathematics	<ul style="list-style-type: none"> • Understand the importance and objectives of teaching mathematics. Understand in nature of mathematics. • Know about in contribution of mathematician. • Understand in pedagogical analysis of different topic.

CO15	Assessment for Learning	<ul style="list-style-type: none"> • Gain a critical understanding of issues in assessment and evaluation. • Differentiate between various types of assessment. • Use of a wide range of assessment tools. • Select and construct various types of assessment tools appropriately. • Evolve realistic, comprehensive and dynamic assessment.
CO16	Gender, School and Society	<ul style="list-style-type: none"> • Develop basic understanding of gender and its related key concepts. • Understand some important landmarks in connection with gender and education in the contemporary perspective. • Learn about gender issues in school curriculum, text and pedagogical processes. • Understand the relationship of gender, power and sexuality to education.
CO17	Inclusive School	<ul style="list-style-type: none"> • Understand the concept and importance of inclusiveness in education. • Use different teaching strategies for inclusive education. • Understand the role of teachers, parents and community for supporting inclusion. Understand the recommendations of various Policies

CO18	Understanding the Self	<ul style="list-style-type: none"> • Understand the self of the growing student as well as teacher. • Shape their own and student's sense of identity. • Reflect on one's aspirations and possibilities in order to develop a growing sense of agency as a 'teacher', a 'professional', as well as a 'human being'.
CO19	Reading and Reflecting on Texts	<ul style="list-style-type: none"> • Understand different types of Text. • Reflect upon different types of policy document. • Discuss narrative text, autobiographical text and ethnographical text.
CO20	ENVIRONMENTAL EDUCATION	<ul style="list-style-type: none"> • Understand the concept of environment. • Understand the concept of environmental crisis and Management. • Understand the nature, need and importance of environmental education. • Know about the natural disasters. • Identify and correlate the role of International organisations in the management of environment.
CO21	Health and Physical Education	<ul style="list-style-type: none"> • Understand the concept of holistic health and its various dimensions. • Understand the importance of sports and yoga for development of holistic health. • Be equipped about their health status. • Sensitize, motivate and help them to acquire the skills for physical fitness.

CO22	Guidance and counseling	<ul style="list-style-type: none"> • Understand the need and importance of Guidance and Counseling. • Develop skills of collection of data through testing and non-testing tools. Conduct a counseling interview. • Organize guidance programs in secondary/senior secondary schools.
CO23	Strengthening Language Proficiency	<ul style="list-style-type: none"> • Comprehend ideas for reflection and thinking, as well as for expression and communication. • Enhance one's facility in the language of instruction is thus a vital need of student-Teachers. • Strengthen the ability to 'read', 'think', discuss and communicate' as well as to 'write'.
CO24	Special Education	<ul style="list-style-type: none"> • Develop an awareness and skill in identifying special children. • Equip themselves with latest trends of the. special education. • Impart knowledge about functioning of special schools.
CO25	School internship	<ul style="list-style-type: none"> • Develop observational skills of teaching profession. • Develop a comprehensive and critical understanding on school plant and related activities. • Develop the managerial skills required in schools. • Understand pedagogical skills and how to apply these skills in real teaching situations.

Note - These are the course outcomes of subject Education as it is an integrated course comprising BA and B.ED So Regarding the course outcome of subject psychology, History ,Political Science ,Geography, Sociology, mathematics, Physical Education and languages are same as BA(traditional) .So it will not separately defined.