SRI GURU TEG BAHADUR KHALSA COLLEGE

SRI ANANDPUR SAHIB

SESSION: 2020-21

PROGRAMME OUTCOMES, PROGRAMME SPECIFIC OUTCOMES & COURSE OUTCOMES

(A) Programme Outcomes & Programme Specific Outcomes

Department of Political Science

B.A. (Political Science)

Programme Outcome:-

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

Programme Specific Outcome:-

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

1) For teaching in schools after qualifying requisite tests.
2) For working or participating in political institutions, political groups and international political sector.
3) For pursuing further studies in the field of state, national and international politics.

M.A. (Political Science)

Programme Outcome:-

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

Programme Specific Outcome:-

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

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

Department of Punjabi
M.A. Punjabi

Programme Specific Outcome

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

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

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

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

B.A. (Punjabi)

Programme Specific Outcomes

B.A.Punjabi is an undergraduate Programme that envelops the study of topics such as Poetry, Modern Punjabi Story, Punjabi Sufi-Poetry, Old And Modren Punjabi Folklore and culture, Punjabi Litrature, Punjabi Criticism and Western Literary Approaches etc.

Those candidate who are interested in Punjabi in Punjabi language and its related fields etc. most appropriate for this course and also those who are willing to go for teaching fields at higher degree level both in private colleges or government institutions.

This Programme empowers the candidate to go for a wide variety of Punjabi jobs of an interpreter or translator which may be of various sorts , for example general interpreting consecutive interpreting and liaison interpreting. Most of translator work in an assortment of fields, which oncorporate specialized logical abstract, technical scier literary or business.

Bachlor of arts (B.A) Punjabi is the specialization or primary concentration of one degree. Punjabi is the study and philosophy of the Punjabi language. Subjects typically study Drama, Poetry, Fiction, Literary, History And criticism etc. under BA Punjabi Course structure.

Department of Geography
B.A.(Geography)

Programme Outcome (PO): -

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

1) Student will gain the knowledge of physical geography. Student will have a general understanding about the geomorphological and geotechnical process and formation. They will be able to correlate the knowledge of physical geography with the human geography.
2) Student will be able to analyse the problems of physical as well as cultural environments of both rural and urban areas. Moreover, they will try to find out the possible measures to solve those problems.
3) They will be eligible for conducting social survey project which is needed for measuring the status of development of a particular group or section of the society.
4) Students will be able to learn the application of various instruments and by these they will be able to collect primary data.
5) As a student of Geography Course, they will be capable to develop their observation power through field experience and in future they will be able to identify the socio-environmental problems of a locality.
6) After the completion of the Programme, they will be efficient in their communication skill as well as power of social interaction. Some of the students are being able to understand and write effective reports and design credentials.
7) They will perform effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
8) Identify the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of societal and environmental change.

Programme Specific Outcome (PSO): -

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

1) Graduates will be able to explain physical processes and their spatial distribution on the Earth’s surface, including landforms, climate, soils, vegetation, and hydrology.

2) They will identify and critically analyse patterns of human-environment interactions, including perception, problems distribution and use of natural resources.
3) Graduates will design maps to analyse and interpret patterns of physical and human characteristics on the Earth's surface and apply geospatial tools to appraise real-world problems.
4) Graduates will be able to explain principles and tools of geographic information science including cartography, remote sensing, and geographic information systems.
5) Imbibing knowledge, skills and holistic understanding of the Earth, atmosphere, oceans, and the planet through analysis of landform development; crustal mobility and tectonics, climate change and dynamics; soil formation and classification; hydrological and oceanographic studies etc.
6) Understanding the role and functioning of global economies, industrial locations; and the use and exploitation of resources with impacts.
7) Developing a sensitive and sustainable approach towards the ecosystem and the biosphere with a view to conserve natural systems and maintain ecological balance.
8) Inculcating a tolerant mindset and attitude towards the vast socio-cultural diversity of India by studying and discussing contemporary concepts of social and cultural geography.
9) Sensitization and awareness about the hazards and disasters to which the subcontinent is vulnerable, and their management.
10) Training in practical techniques of mapping, cartography, software's, interpretation of maps, photographs, and images etc; to understand the spatial variation of phenomena on the Earth's surface.

Department of Religious Studies

B.A. 1,2 ,3 (Sem 1 to 6)

Paper Code : (115,215,315,415,515,615)

Programme Learning and Specific Outcome

Learning about religion and learning from religion are important for all students, religious studies education. It helps the students develop an understanding of themselves and others. Religious studies promotes the spiritual, moral, social and cultural development of individuals and of groups and communities. development. Because education is important for all citizens and the government invests heavily in the field of education , any factor that significantly promotes academic achievement is importanttainm[1)]ent to the common good. A growing body of research has consistently indicated that the frequency of religious practice is significantly and directly related to academic outcomes and educational attainment. Religious education emphasises respect for others, regardless of their beliefs, race or social status. In teaching about the beliefs and traditions of other people, the subject promotes discernment and enables students to combat prejudice. It keeps students out of trouble. They provide students with skills for communication, social interaction, and work discipline that can create pathways to both independence and

obedience. But what about religion? Just like education, religion plays a major role in the socialization process. Religion is a strong belief in power or powers that control human destiny. Religion and Education are seemingly two different roads in the present day scenario. But religion is as much a part of education as education is a part of religion. Yet both are distant from each other when it comes to the modern-day system of education. The fact is that Religion itself is an education and education has been influenced by Religion in more than one way. Today, there are very few institutions which actually utilise religious teaching in education or impart religious education as a part of University curriculum. Now a days in higher education religious education seems to be lost in such a sphere. The importance of the colleges/ universities is evident in the architectural marvel of the buildings and the advanced facilities like computers, refreshment during the college / university day which lay more emphasis on materialistic gains but what about spiritual growth. In all kinds of colleges / universities, whether simple colleges and universities with a religious character be it Muslim, Jewish, Christian, Sikh, religious teachings are the important component of education and as such college / universities have a prime obligation to promote the understanding of religion and its fundamentally important place in human attitudes and contribution to human flourishing. It is important to introduce it at the right stage of development for a proper understanding of different religious traditions. It is only out of this understanding that a respect will grow for different faith and traditions amongst the students.

The department of Religious studies with its graduate Programme, intends to preserve further and disseminate the various aspects and forms of religious education and knowledge of religious traditions in modern perspectives. The Programme aims at equipping enabling future researchers with the fundamental concepts, theories and practices of different religions knowledge domains. To empower the students with modern and scientific tools, inter – religious approach and to design such modules to help them in becoming good citizens are some of the main objectives of the course.

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

Department of English
M.A. (English)

Programme Outcome

1) To acquaint a student with conventional as well as contemporary areas in the discipline of English.
2) The study of this paper will enhance the critical thinking of the students.
3) Students will obtain ample knowledge about the various critical approaches
4) To provide in-depth understanding of all core areas specifically
5) Literature and Modernity,Twentieth Century Poetry and Fiction, Literature and Postcoloniality ,Literature and Gender,Creative Writing.

Programme Specific Outcome

After the completion of the M.A Course, a student is able

1) For pursuing research in their chosen areas.
2) For teaching in Schools and Colleges after qualifying requisite tests.
3) For working as data analyst.
4) For obtaining ample knowledge about the various critical approaches.

B.A. Honours in English

Programme Outcomes

Pursuing B.A Honours in English chiefly makes the students‟ understanding of English Literature more profound. The course is designed to help learners to analyse, appreciate, understand and critically engage with literary texts written in English from various perspectives, paying attention to themes, generic conventions, historical contexts, and linguistic and stylistic variations and innovations. This course provides the students with a good literary base to take up their master‟s and further research oriented courses in English Literature. Depending upon how students engage their time in building their profile and skills, this course can open many career options: from being a content writer to a civil servant. Students can also go for English related jobs in various sectors such as information technology, educational institutions, free lancing and commercial undertakings etc.

Programme Specific Outcomes

Apart from developing the literary skills, the course helps students build skills of analytical and interpretive argument; become careful and critical readers; practice writing in a variety of genres as a process of intellectual inquiry and creative expression; and ultimately to become more effective thinkers and communicators who are well-equipped for a variety of careers in our information-intensive society.

Department of Fine Arts
B.A. (Fine Arts)

Programme Outcomes (PO):

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

1) Apply theoretical knowledge of principles and concepts of Fine arts to practical problems.
2) Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
3) Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.
4) Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.
5) To impart knowledge of theoretical perspectives of art.
6) The range of experience covers two- and three-dimensional forms both the point of view of specially defined structural problems and their social and historic significance.

Programme Specific Outcome (PSO)

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

1) Apply theoretical knowledge of principles and concepts of Fine arts to practical problems.
2) Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
3) Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.
4) Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.
5) To impart knowledge of theoretical perspectives of art.
6) The range of experience covers two- and three-dimensional forms both the point of view of specially defined structural problems and their social and historic significance.

Department of Journalism and Mass Communication (JMC)
B.A. (JMC)

Programme Outcomes

The students will be able to understand the different phases of print and broadcast journalism.

To develop the communication skills, theoretical and practical knowledge among the students in print, electronic and new media. The Communication and Journalism Department is committed to providing undergraduate students with a quality education in the communication and journalism disciplines that is current, relevant, practical, and personal. The department's goals include enabling students who graduate to be able to compete successfully for positions at graduate schools nationwide. Another departmental goal is that students who graduate in communication will be prepared for entrylevel positions as professionals within communication-related fields. Students who graduate in journalism will be prepared for entry-level positions as professionals within journalism and related fields.

Programme Specific Outcomes

Students will be able to write a variety of mass media products, including news stories, press releases, and advertising copy, following accepted journalistic standards, including Associated Press style. Students will be able to create and design emerging media products, including blogs, digital audio, digital video, social media, digital photography, and multimedia.

Department of Hindi
M.A. (Hindi)

Programme Outcomes

□□□□□□ □□□□ □□□□ □□ □□□□□□□ □□□ □□□□□ □□□□□ न □□ □□, वह □□□□□□ □□ □□□□□ □□□ □□□□ □□ □□□ □□□□□□□ □□□□ □□, □□□ □□□□□□ □□ □□□□□□□□□□ □□□□□ □□□□ और □□□□□□□ □□ □□□□ □□□□□□□□□□□ □□□□ □□ □□□□ □□□ □□□□ □□□□□□

□□ □□□□□ □□□ □□□□ □□□□□□□□□ □□□□□ □□□□ □□□□ □□□□□ □□□□ □□ □□□□□□□ □□□□□□□□□ एक □□□□□□□□ □□□□, □□□□□ □□□□□□□□□ और □□□□□ □□□□□□□ बन कर □□□□□□□ □□□ □□□□□□ □□□□□□□ □□ □□□□□□ □□□□□□ कर □□□□ □□□ आज □□ □□□□□□ □□□ □□□ □□□□□□ □□□□□□□ □□□ □□□□□□ □□□□□□ □□ □□ चलन □□, □□□□□□□□□□ □□□□ □□□□ □□ □□□□□□ इस □□□□□□□ □□ □□ □□□□ □□□□ □□□ □□□□□□ □□□□□□, □□□□□□ □□□□□□□□□ □□ □□□ □□□□□ □□□□ □□ □□□□□ □□ इस □□□□□□□ □□□□□□र □□□ आ □□□□ □□□ □□□□□□ □□□□□, □□□□□□□□ □□□□□□□ □□ □□□□□ □□ □□□ □□□ □□□□□□ □□□ □□□ □□□□□□ □□□□□□ □□□ □□□□□□□ □□□□□□□, □□□□□□□□ □□□□□□ □□□□□□□□ □□□ □□□□□ □□□□□□□ □□□□□ □□□□□□ □□□□□ □□ अवसर □□ □□□□□□□□□□□□ □□□□□ □□ □□□□□□□□□□□□□□ □□ □□□ □□□□□□ □□□□ □□□□□ □□□□ □□ □□□□□□□□□□□□□□ □□ □□□□□□ □□□ □□□□ □□□□□□□□□ □□□□□ □□□ □□□□□ □□□□ □□□□ □□□□□□ □□□□ □□□

Program Specific Outcomes

The Post Graduate Course in Hindi enable the students in following aspects:

1) The student is able to gain sound knowledge of the subject. This will help in clearing various competitive exams.
2) The student can take up teaching as profession.
3) The student can become a translator job.
4) The student can join any publishing house or media house after the completion of the course.

Department of History
M.A. (History)

Programme outcomes

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

Programme specific outcomes

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

Department of Gurmat Sangeet

B.A. (Gurmat Sangeet)

Programme Outcomes

1) To Introduce various definitions in context of Gurmat Sangeet such as: Raag, Rahao, Mahalla, Ank etc.
2) To impart knowledge about the various gayan shaillies of Gurmat Sangeet.
3) To increase the knowledge about Notation system of Gurmat Sangeet.

Programme Specific outcomes:

1) The students will be learning about the historical background, musical terms, role of music in human life and contribution of different musicologist in the field of Music.
2) The students will also know about the different Raags and Taals, and how Instruments are used.

BA (Music)

Programme Outcomes

1) To Introduce various definitions in context of Indian Classical Music.
2) To impart knowledge about various Gayan Shaillies of Indian Classical Music.
3) To aware the students about brief knowledge about Bhatkhande and Digumber Pulskar Notation system.

Programme Specific outcomes:

1) The student will be learning about the historical background, Musical terms, Role of Music in Human life and contribution of different musicologist in the field of music.
2) The students will also know about the different Raags and Taals, and how Instruments are used.

Department of Physical Education

B.A. (Physical Education)

Programme Outcomes

Physical Education develops students competence and confidence to take part in a range of physical activities that become a central part of their lives. The course will help the students in

1) To nurture sportsmanship in all aspects of competition.
2) To widen the sporting experience and enjoyment of each student.
3) To develop passion for active recreation and sport.
4) To assist the students to realize their physical potential in a variety of sporting environments.
5) To encourage healthy and active lifestyle .

Programme Specific Outcomes

The course will help the students to foster a career in Physical Education. The students on completion of professional degree in the field of physical education will be able to pursue career in various streams. The student can work as Assistant Professor, Coach, PET,DPE .

Department of Defence Studies

B.A. (Defence Studies)

Programme Outcomes

Deep insight about the key indicators of Defence which help the students to know about the working of Defence Services, international relations indicators insure global security, working of Defence policies and their impact on National Security. It also helps the students to know about the functioning of D.P.S.U sector. It also equips the students with knowledge to make them more logical and realistic.

Programme Specific Outcomes

The Programme will help the students to develop a realistic view which make them competitive globally. It will enhance their overall knowledge and help them to fetch jobs both in public and private domain. The students can compete easily for different jobs like economic services, insurance sector, banking and other private jobs. It also helps to equip more knowledge about business environment and to start their own venture and help them self employment.

Department of Physics
Bachelor of Science (Honors) Physics

Programme Overview

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

Programme Outcomes

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

Programme Specific Outcomes

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

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

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

Master of Science Physics

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

Programme Educational Objectives

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

Programme Outcomes

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

1) Apply theoretical knowledge of principles and concepts of Physics to practical problems.
2) Use mathematical techniques and interpret mathematical models of physical behavior.
3) Demonstrate the ability to plan, undertake, and report on a Programme of original work; including the planning and execution of experiments, the analysis and interpretation of experimental results.
4) Assess the errors involved in an experimental work and make recommendations based on the results in an effective manner.
5) Develop communication skills, both written and oral, for specialized and non-specialized audiences.

B.Sc (NON-MEDICAL)

Programme Outcomes

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

1) The graduates will have knowledge of fundamental laws and principles in a variety of areas of Physics along with their applications.

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

Department of Chemistry
M. Sc. Chemistry

Programme Outcomes (PO)

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

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

Programme Specific Outcome (PSO)

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

B.Sc(Hons) Chemistry

Programme Outcomes (PO)

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

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

Programme Specific Outcome (PSO)

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

B.Voc (Pharmaceutical Chemistry)

Programme Outcomes

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

1) Understand need, importance and use of lab management techniques.
2) Create awareness and sense of responsibilities towards Good Lab Practices.
   Undertake higher study/job in the field of pharmaceutical/chemical sciences based institutes/industries.

Programme Specific Outcome (PSO)

1) Exhibit and apply the fundamental knowledge of Safely handling glass ware and chemicals.
2) Collaborate effectively on team-oriented projects in the field.
3) Apply the knowledge to employ Good Lab Practices while working in chemical laboratories.
   Make the students efficient enough to use sophisticated instruments used in Pharmaceutical Industries.

PG Department of Computer Science
BCA

Programme outcomes:

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

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

Programme Specific outcomes

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

B.Sc. (H) AI & DS

Programme outcomes:

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

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

Programme Specific Outcomes:

1) Enable graduates to design and harness the power of AI in broad application fields from vision to advanced autonomous systems.
2) Explain and critically assess a range of artificial intelligence techniques used in data analytics and in other related areas.
3) Examine large amounts of data to uncover hidden patterns, correlations, insights, and help organizations harness their data to identify new opportunities.
4) Critically evaluate emerging data analysis technologies and assess how it can be applied to different types and amounts of data.
5) Obtain expertise to turn actionable insights and cutting-edge technology into innovative products to solve real world problems.

6) Effectively communicate findings in terms of reports and presentations.
7) Inculcate independent research ability that addresses fundamental problems.

B.Voc. (SD)

Programme Outcomes:

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

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

Programme Specific outcomes:

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

Diploma in Computer Hardware and Networking

Programme outcomes:

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

Programme Specific Outcomes:

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

platforms.

Add on Certificate Course in Web Designing

Programme Outcomes:

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

Programme specific Outcomes:

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

M.Sc. (IT)

Programme Outcomes:

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

Programme Specific Outcomes:

1) Demonstrate a comprehensive understanding of the broad themes in Information Technology.
2) Use and apply current technical concepts and practices in the core information technologies of networking, data management, software engineering etc.
3) Demonstrate a deep understanding of the IT methodologies and frameworks used to solve complex computing problems related to at least one IT Body-of-Knowledge.
4) Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.
5) Effectively integrate IT-based solutions into the user environment.
6) Developed and implement optimal solutions to complex computing problems using industry-recognized best practices and standards.
7) Apply ethical decision makingin the development, implementation and

management of IT systems.

M.Sc. (AI &DS)

Programme outcomes:

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

Programme specific outcomes:

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

PGDCA (Post Graduate Diploma in Computer Application)

Programme outcomes:

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

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

Programme specific outcome:

1) The understanding to apply knowledge of computing and technological advances appropriate to the Programme.
2) Skills to analyse a problem, and identify and define the logical modelling of solutions.
3) Analyze real world problems and use available technological solutions to design and implement the same.
4) Effectiveness in communicating with a wide range of audiences.

5) An ability to analyse the local and global impact of business solutions on individuals, organisations, and society.
6) An identification of the need to engage in continuing professional development.
7) The students acquire knowledge about basics and fundamentals of information technology, basic Programmeming. Students learn to develop and debug codes in different languages.

Department of Agriculture
B.Sc. Agriculture

Programme Specific Outcomes

1st year

1) Establishment of agrometeorological observatory for recording various meteorological parameters
2) Cultivation of horticultural crops using hydroponics technique.
3) To establish smart class room for enhanced teaching
4) Cultivation of paddy through DSR method
5) Awareness camps to farmers to control stubble burning
6) Training to farmers and college students to operate the functioning of Meghdoot app developed by India meteorological department, New Delhi.

2nd Year

1) Nursery management of flowers, vegetable and fruit crops
2) To train students through interdisciplinary minor projects (Nursery raising)
3) Seed production of various vegetable crops (OP) varieties.
4) Soil fertility status of different farm and local area.
5) Establishment of vermi-compost unit

3rd year

1) Cultivation of exotic vegetables using organic inputs
2) Establishment of succulent plant garden
3) Establishment of mother plant fruit orchard.
4) Development of medicinal and aromatics plants.

4th year

1) Current application of horticultural principals and practices propagation,pest managements, production and maintenance .
2) Able to demonstrate critical thinking and problem solving skills as they apply to a variety of plant production systems.
3) To understand and analyze the current events and issues that are occurring in agriculture and how they affect futuristic agriculture.
4) This Programme will also help students to enhance their employability for jobs in different sectors.

B.Voc (Food Processing)

Programme Specific Outcomes

1) The Programme outcomes are the skills and knowledge which the students have a teach exit level/at the time of graduation. These outcomes are generic and are common to all exit levels mentioned in the Programme structure.
2) Students with vocational training can find work in several state and central government organizations, non-profit groups, and academic institutions and in private sectors as well.
3) This Programme prepares students for specific types of occupations and frequently for direct entry into the market.
4) After completion of this Programme students will have enough competences,to get benefit from market opportunities.
5) This Programme would enable students to update their knowledge and professional skills for entering the work force executing income generating activities or occupying better positions

Diploma in Agriculture

Programme Specific Outcomes

1) Students will be competent as Agripreneur to start their own business starting from sowing extended to market and product added values.
2) Students can opt job as soil Analyst, food analyst and supervisor at agri based industries.
3) Plant breeding units are always in search of plant breeders.
4) After completing the course students can prefer agri-marketing and also irrigation analyst.

PG Department of Commerce and Management

B.Com (Honours)

B.Com with Honours is similar to the B.Com degree when it comes to the subjects. This is also a 3-year degree course that is easily available in most recognized universities and colleges. This degree is a great stepping for further education, especially if one wants to do professional courses like CA, CS. Students who wants a career in different industries like teaching, journalism, communications, design, etc. go for B.Com (H).

Nature and Objective of Programme:

1) Develop an understanding of commerce and apply the skills and knowledge in a business organization.
2) Equip the graduates with the know-how of operating successfully in a continuously changing business environment.
3) Equip graduates with the skills required to lead management decisions.
4) Make informed and ethical decisions based on thorough knowledge of commerce concepts.

Programme Outcomes:

1) Deep Understanding of Accounting Issues Related to Business.
2) Understanding of General Business Functions Impacting Organization.
3) Interpersonal and Communication Skills.

4) Understanding Ethical, Social Sustainable Business Issues.
5) Developing Entrepreneurship Acumen.

Programme Specification Outcomes

1) Demonstrate ability to interpret and analyze financial statements.
2) Understanding the rules and regulation laid down by Accounting Body.
3) Demonstrate ability to understand Compliance as per various enactment.
4) Acquiring conceptual clarity of various functions and ability to analyze.
5) Various Functional issues demonstrating ability to evolve strategies for business.
6) Demonstrate effectively oral and written Communication.
7) Demonstrate Ability to work in Groups. Exhibit skills like Empathy, EQ.
8) Managerial and Inter-Personnel skills
9) Demonstrate understanding of social cues and contexts in social interaction.
10) Develop Ethical practices and Imbibe values for better corporate governance.
11) Understand Ethical challenges and choices in a business setting demonstrate understanding of sustainability related concerns in varied areas
12) Understand the ecosystem of start up in the country.
13) Demonstrate the ability to create business plans.
14) Students will demonstrate progressive effective domain development of values, the role of Accounting in society and business Learner will get ability to clear exams like CA, CS, ICWA and others.

B.Com.

The aim of three years degree Programme in B.Com. is to provide the learners a platform for character building to perform well & contribute to the society. Learning outcomes based curriculum framework (LOCF) is adopted to impart students with sound knowledge and humanistic skills, constructive & productive character developments so that they can respect the best people of the society.

Programme Outcomes (PO):

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

1) Learning outcomes based curriculum framework LOCF based curriculum three years degree B.Com. Programme help students to develop in depth knowledge of the areas like accounting, finance, marketing, human resource management, economics and business laws.
2) The graduates of B.Com. Programme will be able to develop skills and attitudes needed for critical thinking which will help them in a comprehensive problem solving approach. They shall be exposed to the pedagogy that helps them understand real life situations through class room training & and case studies. It aims at building the basic ability to think critically, evaluate dispassionately and solve complex problems creatively. The content is organised in such a way that the students would be able to think from diverse perspectives and suggest solutions according to their own sensibilities.

3) The Programme will help the students to develop reasoning based analytical ability which often requires in practical business life. B.Com. Programme is prepared in such a way that it helps students to solve various issues related to business:
    - Basics of accounting will help them to solve the problems like making accurate financial statements.
    - Managerial skills will help them to tackle various managerial centric problems like; to plan, to organise, decision- making, ideas formulating, controlling
4) B.Com. Programme contains various courses like principles of management, HR management, Industrial Relations which will help to learn managerial & entrepreneurial skills to work & timely manage the affairs of the business. These attitudes are developed through application of concept based practices, participative classroom discussions, problem solving tasks, case studies etc.

Programme Specific Outcome (PSO)

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

1) Understanding of individual and company accounting system.
2) Understand the functions and operations of bank, technological development in banking and insurance companies.
3) Adequate knowledge on income tax provision and implication.

B.Voc. Retail Management

Programme Outcomes (PO):

Retail Sector has been at the helm of India's growth story. The Retail industry in India is vibrant and one of the fastest growing markets in the world especially in the sectors such as modern retail, traditional retail, e-commerce, direct selling, direct marketing etc. The B.Voc.in Retail Management is a specialised undergraduate bachelor's degree Programme which prepares the graduate to acquire such skills so that they become trained skilled manpower in the Retail sector.

Programme Objective: Following are the broad Programme Objectives:

1) To provide students with a comprehensive understanding of the theoretical and applied aspects of retail management.
2) To inculcate all the desired skills to meet the needs of today’s customer by procuring the desired merchandise from the retail stores for their personal use.
3) To equip students with skills required to bring the customers into the store and respond to their buying needs.
4) Students completing the first year get a Diploma certificate, after second year they get the Advanced Diploma certificate and after completion of three years, the B.Voc. Retail Management Degree is awarded.
5) The course curriculum has 40% general education (theory) and 60% vocational training (practical) components.

6) These Programmes follow semester system and offer credits after completion of the course.
7) Adequate emphasis should be given to language and communication skills.
8) The students who have enrolled in B.Voc. Retail Management courses appreciate the practical focus and are confident that their chances of getting a suitable job are higher than other graduates.
9) The advantages of B.Voc. Retail Management courses are that they help ensure the learners have adequate skills, make them work-ready and enhance the employability of the graduate students.
10) A unique feature of the curriculum is the blend of vocational and business management concepts. This higher education system incorporates the requirements of various industries in a flexible manner which develops holistic and well – groomed graduates thus meeting the emerging needs of the economy.
11) Industry experts and academicians welcome this announcement and view this as an opportunity for vertical mobility.

Programme Specific Outcome (PSO)

After completing this course students will be able to:

1) Explain theoretical framework of Retail Management
2) Demonstrate the job role of Sales Associate
3) Demonstrate the job role of Team leader in retailing sector
4) Demonstrate the job role of Departmental Manager in an organised retail sector
5) Demonstrate the job role of Store Manager in any retail organisation
6) Effectively use Point Of Sale software
7) Appraise and interpret various acts and laws related to retail sector
8) Skill-based education should be the foundation of modern education", with a similar view, the University Grants Commission (UGC), in 2013, introduced Bachelor of Vocation, commonly known as B.Voc. Retail Management degree Programme with multiple entry and exit points. B.Voc. Retail Management is a three-year Programme which specifically focuses on skill development and makes the students industry-ready.
9) Bachelor of Vocation is quite different from a common degree Programme as the curriculum of B.Voc. Retail Management degrees involve 60 percent practical and 40 percent theoretical learning's. The emphasis given on the practical and training aspect ensures that the students become more skilled and trained in their disciplines.
10) The multiple entry and exit points add to the flexible nature of the B.Voc. Retail Management Programme. After completing one year, if the student opts for the exit, he/she is awarded a diploma certificate. Similarly, there are other exit points from where the students can take an advanced diploma or a full-fledged B.Voc. Retail Management degree.
11) Enhancing the employability of the graduates and meeting the industry requirements was one of the many objectives behind introducing a Bachelor of Vocation degree course.The course not only prepares the students for getting employment but also provides them with

entrepreneurship skills. The career options after completing B.Voc. Retail Management degree are trade-specific and are vast.

B.Voc. Hospitality and Tourism

Programme Outcomes (PO):

The broad category of fields within service industry includes lodging, event planning, theme parks, transportation, airline, cruise line, and such other employment opportunity within the hospitality & tourism industry. Today, service industry is a major source of income for many countries, and brings impact on the economy of both the source and host countries, in some cases being of vital importance. The B.Voc. In Hospitality and Tourism is a specialised undergraduate bachelor's degree Programme which prepares the graduate to acquire such skills so that they become trained skilled manpower in the Tourism & Hospitality Industry.

Programme Objective: Following are the broad Programme Objectives:

1) Industry experts and academicians welcome this announcement and view this as an opportunity for vertical mobility.
2) To provide students with a comprehensive understanding of the theoretical and applied aspects of Tourism & Hospitality Industry.
3) To inculcate all the desired skills of standard operating procedures & service provisions to meet the needs of today's customer by providing desired services required in Tourism &Hospitality Industry.
4) To equip students with hospitality skills required to provide customer satisfaction into the hotel & tourism sector and fulfil guest requirements for food & beverage service, meetings, conferences, events, travel moments & caterings
5) Students completing the first year get a Diploma certificate, after second year they get the Advanced Diploma certificate and after completion of three years, the B.Voc. Hospitality and Tourism Degree is awarded.
6) The course curriculum has 40% general education (theory) and 60% vocational training (practical) components.
7) These Programmes follow semester system and offer credits after completion of the course.
8) Adequate emphasis should be given to language and communication skills.
9) The students who have enrolled in B.Voc. Hospitality and Tourism courses appreciate the practical focus and are confident that their chances of getting a suitable job are higher than other graduates.
10) The advantages of B.Voc. Hospitality and Tourism courses are that they help ensure the learners have adequate skills, make them work-ready and enhance the employability of the graduate students.
11) A unique feature of the curriculum is the blend of vocational and business management concepts. This higher education system incorporates the requirements of various

industries in a flexible manner which develops holistic and well – groomed graduates thus meeting the emerging needs of the economy.

Programme Specific Outcome (PSO)

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

1) Explain theoretical framework of Tourism & Hospitality Industry.
2) Demonstrate the job role of F&B Service Steward in Hospitality Sector.
3) Demonstrate the job role of Meeting, Conference and Event Planner.
4) Demonstrate the job role of Tour Manager in Tourism Sector. • Demonstrate the job role of Asst. Catering Manager in Hospitality Industry.
5) Effectively learn Customer Handling, service recovery & Guest Interfaces.
6) Appraise and interpret various acts and laws related to service sector.
7) Appraise and interpret various acts and laws related to retail sector
8) Skill-based education should be the foundation of modern education", with a similar view, the University Grants Commission (UGC), in 2013, introduced Bachelor of Vocation, commonly known as B.Voc. Hospitality and Tourism degree Programme with multiple entry and exit points. B.Voc. Hospitality and Tourism is a three-year Programme which specifically focuses on skill development and makes the students industry-ready.
9) Bachelor of Vocation is quite different from a common degree Programme as the curriculum of B.Voc. Hospitality and Tourism degrees involve 60 percent practical and 40 percent theoretical learning's. The emphasis given on the practical and training aspect ensures that the students become more skilled and trained in their disciplines.
10) The multiple entry and exit points add to the flexible nature of the B.Voc. Hospitality and Tourism Programme. After completing one year, if the student opts for the exit, he/she is awarded a diploma certificate. Similarly, there are other exit points from where the students can take an advanced diploma or a full-fledged B.Voc. Hospitality and Tourism degree.
11) Enhancing the employability of the graduates and meeting the industry requirements was one of the many objectives behind introducing a Bachelor of Vocation degree course.The course not only prepares the students for getting employment but also provides them with entrepreneurship skills. The career options after completing B.Voc. Hospitality and Tourism degree are trade-specific and are vast.

BBA

Programme Outcomes (PO):

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

1) Enable students to apply knowledge of management theories and practical to solve business problems.
2) Encourage analytical and critical thinking abilities for decision making.
3) Promote ethical and value based leadership ability.

4) Enable students to effectively communicate business issues, management concepts, plans and decisional both in oral and written form using appropriate supportive technologies.
5) Enable students to demonstrate the appropriate techniques to effectively manage business challenges.
6) Make students capable of recognizing and resolving ethical issues.
7) Helps to prepare students for managerial roles and as entrepreneurs.

Programme Specific Outcome (PSO):

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

1) Provide verbal, reasoning, data interpretation, Quantitative and communication skill to solve specific business problems and decision making.
2) Apply ethical principles and commitment towards professional ethics and responsibility.
3) Providing an opportunity for the students to gain practical exposure towards the workplace and make them industry ready.
4) Promote entrepreneurship by providing understanding of fundamentals of creating and managing innovation, new business development and high growth potential entities.
5) Ability to analyze various functional issues affecting the organization.
6) Demonstrate effectively Oral and Written Communication.
7) Demonstrate ability to work in Groups.

Master of Commerce

Programme Outcome

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

Programme Specific Outcome

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

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

Bachelor of Commerce (Accounting and Finance) B.Com (A & F)

Programme Outcomes (PO):

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

1) Describe, explain, and integrate fundamental concepts underlying accounting, finance, management, marketing, and economics
2) Use information to support business processes and practices, such as problem analysis and decision making
3) Apply quantitative skills to help analyze and solve business problems and to take advantage of business opportunities
4) Apply oral and written communication skills
5) Describe and explain the ethical and social responsibilities of accountants in ensuring the integrity of financial information
6) Develop an understanding of internal control issues and the effects of the regulatory environment on financial reporting
7) Apply knowledge of managerial accounting theories to business organizations, state and local governments, and nonprofit organizations
8) Apply knowledge of federal tax laws and procedures to individuals and businesses

Programme Specific Outcome (PSO)

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

1) Students will be able to demonstrate progressive learning of knowledge of Accounting and Computerised set of Accounting books.
2) Learner will acquire practical skills to work as Tax Consultant, Audit Assistant and other Financial supporting services.
3) Develop communication skills, both written and oral, for specialized and non-specialized audiences.

Department of Botany
B.Sc Medical (Botany)

Programme Outcomes (PO):

On Completion of the Course, Students will be able to:

1) Acquire theoretical as well as practical knowledge about different subject areas. These subject areas include Chemistry, Biology and other fields depending on the specialization a student opts.
2) Students can join as scientist and can even look for professional job oriented courses. This course also offers opportunities for serving in Indian Army, Indian Navy, and Indian Air Force as officers.
3) Opt for higher studies i.e. M. Sc and then do some research for the welfare of mankind.
4) Develop scientific temper and thus can prove to be more beneficial for the society as the scientific developments can make a nation or society to grow at a rapid pace.

Programme Specific outcomes (PSO):

1) B.Sc. Medical student is able to acquire knowledge regarding Botany, Zoology, Chemistry, Biotechnology, Fish and Fisheries.

2) Medical Students will be able to define and explain major concepts in the biological sciences.
3) They are able to correctly use biological instrumentation and proper laboratory techniques.
4) Students will be able to communicate biological knowledge in oral and written form
5) Students will be able to recognize the relationship between structure and function at all levels: molecular, cellular, and organismal.
6) They can go for Indian Forest Service and other competitive examinations.
7) They can opt for higher studies in Botany, Zoology, Chemistry, Biotechnology and Fisheries.
8) Biotechnology is another fast growing field which is more applicable in Industries and Hospitals.

M.Sc. Botany

Programme Outcomes

On completion of Programme, students will be able to:

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

Programme specific outcomes

On completion of Programme, students will be able to:

1) Identify different groups of plants on the basis of their morphological, anatomical and genetic characters.
2) Practice safe laboratory procedures, using appropriate protective, biosafety and emergency procedures.
3) Identify the composition of prokaryotic and eukaryotic cells, and their functions.
4) Learn about the Structure and Chemical composition of macro and micromolecules.
5) Learn about the Environmental factors affecting the life cycle of plants.
6) Learn about the different research techniques using instuments.
7) Learn about the Ecological and phytogeographical concepts.
8) Learn about the statistical analysis.
9) Learn about the conservation of biodiversity through *in situ* and *ex situ* practises.
10) Learn about the qualitative and quantitative analysis using suitable sampling and techniques.

11) Learn about the origin, history, Botany, cultivation, processing and uses of Plants.
12) Learn about the cytology and genetic characters of plants.
13) Learn about the concept of Intellectual property Rights.

Department of Mathematics
B.A. (General) Mathematics

Programme outcome:

Upon completion of the B.A.(general) Mathematics Programme, students will be able to

1) Develop deep interest in learning mathematics
2) Familiar with different areas of Mathematics
3) Develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.
4) Solve complex problems by critical understanding, analysis and synthesis.
5) Recognize and appreciate connections between theory and applications
6) Work effectively in a multi-disciplinary enviroNon-Medicalent
7) Get systematic understanding of application of the concepts and theories of mathematics in the real world-to an advanced level, and enhance career prospects in a huge array of fields.

Programme specific outcome:

Part-1(sem1-sem2)

After completion these two semesters, students will be able to

1) Solve complex problems using knowledge of calculus.
2) Develop the knowledge and understanding of definitions, concepts and principles.

Part-2(sem3-sem4)

After completion of these two semesters, students will able to

1) Get systematic understanding of application of the concept and theories of mathematics in the real world.

Part-3(sem5-sem6)

After completion these two semesters, students will be able to

1) Recognize and appreciate connections between theory and application.
2) Work effectively in a multi-disciplinary environment.

B.Sc(Non-Medical) Mathematics

Programme outcome:

Upon completion of the B.A.(general) Mathematics Programme, students will be able to

1) Develop deep interest in learning mathematics
2) Familiar with different areas of Mathematics
3) Develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.

4) Solve complex problems by critical understanding, analysis and synthesis.
5) Recognize and appreciate connections between theory and application
6) Work effectively in a multi-disciplinary environment
7) Get systematic understanding of application of the concepts and theories of mathematics in the real world-to an advanced level, and enhance career prospects in a huge array of fields.

B.Sc.(Honors) Mathematics

Programme outcome:

B.Sc. (Hons.) Mathematics Programme endeavor's to instil in students with a genuine interest in their subject area by fostering a creative spirit to help them fulfil their potential, to become creative mathematician.

Upon completion of the B.Sc. (Hons.) Mathematics Programme, students will be able to

1) Develop deep interest in learning mathematics
2) Familiar with different areas of Mathematics
3) Develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.
4) Solve complex problems by critical understanding, analysis and synthesis.
5) Recognize and appreciate connections between theory and applications
6) Work effectively in a multi-disciplinary environment
7) Get systematic understanding of application of the concepts and theories of mathematics in the real world-to an advanced level, and enhance career prospects in a huge array of fields.

Programme specific outcome:

Part-1(sem1 -sem2)

After completion these semesters students will be able to:

1) Develop deep interest in learning mathematics.
2) Recognize and appreciate connections between theory and applications.

Part-2(sem3-sem4)

After completion of these two semesters students will be able to:

1) Develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.
2) To Solve complex problems by critical understanding, analysis and synthesis.

Part 3(sem5-sem6)

After completion of these two semesters students will be able to

1) To Find the error analysis of numerical methods.
2) The practical applications of the subject will be known to the student.

M.Sc Mathematics

Programme outcome:

On completion of course students will be able:

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

Programme specific outcome:

Part 1(sem1-sem2)

After completion these semester of course students will be able:

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

Part-2 (sem3-sem4)

After completion these two semesters students will be able:

(1) To develop skills required for sound analytical and practical knowledge to pursue Careers in research, education and industry.
(2) To develop their understanding and professional capabilities through lifelong Learning.

Department of Zoology

B.Sc. Medical (Zoology)

Programme Specific Outcome:

1) Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms.
2) Analyse complex interactions among the various animals of different phyla, their distribution and their relationship with the environment.
3) Apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
4) Understands the complex evolutionary processes and behaviour of animals.
5) Correlates the physiological processes of animals and relationship of organ systems.
6) Understands about various concepts of genetics and its importance in human health
7) Apply the knowledge and understanding of Zoology to one's own life and work
8) Develops empathy and love towards the animals

M.Sc. (Zoology)

Programme Specific Outcome:

1) Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology.

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

COURSE OUTCOMES
Department of Political Science
B.A. (Political Science)

Course Outcomes

Semester I

BA (POL)-114 –Political Theory-1

Students can easily understand the ideologies and environment of political leadership.

Semester II

BA (POL)-214 –Political Theory-2

Students can easily understand the ideologies and environment of political leadership.

Semester III

BA (POL)-314 –Indian Political System-1

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

Semester IV

BA (POL)-414 –Indian Political System-2

The paper will provide students a fundamental understanding of the working of the Indian political system with reference to political parties, the party system, elections and voting behavior in the backdrop of the critical constitutional debates.

Semester V

BA (POL)-514 –Comparative Political System (UK AND USA)

This paper will acquaint the students with cross cultural and cross national political systems.

Semester VI

BA (POL)-614 –International Politics: Theory and Practice

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

M.A. (Political Science)

Course Outcomes

Semester I

MAPOLSCI-101 – Indian Political Thought-1

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

MAPOLSCI-102 – Western Political Thought

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

MAPOLSCI-103 –Indian Government and Politics

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

MAPOLSCI-104(1) –International Politics

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

MAPOLSCI-104(5) –Sikh Political Thought

The paper will provide students an understanding of key concepts which are the building blocks of the Sikh Political thought. Each will be studied in terms of the main debate over its nature and scope in the discipline and its relationship with other concepts.

Semester II

MAPOLSCI-201 –Indian Political Thought-2

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

MAPOLSCI-202 –Contemporary Issues in International Relations

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

MAPOLSCI-203 –Liberal Political Theory

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

MAPOLSCI-204(1) -Political Process in India

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

MAPOLSCI-204(4) -International Organizations

The paper will provide students an understanding of key theories and issues in International Organizations.

Semester III

MAPOLSCI-301 –Contemporary Political Thought

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

MAPOLSCI-302 –Modern Political Analysis

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

MAPOLSCI-303 –Punjab Politics

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

MAPOLSCI-304(1) –Foreign Policy of India

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

MAPOLSCI-304(2) –Theory and Practice of Public Administration

The paper will provide students a preliminary understanding to different aspects of public administration with special reference to India.

Semester IV

MAPOLSCI-401 –Political Theory

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

MAPOLSCI-402 –Comparative Politics

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

MAPOLSCI-403 –Political Ideologies

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

MAPOLSCI-404(1) – State Politics in India

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

MAPOLSCI-404(2) –Research Methodology

This paper will provide students a preliminary understanding of the major themes of research methodology.

Department of Punjabi
M.A. (Punjabi)

Course Outcomes:

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

Semester I & II

Course Code: PUN101&201

COURSE NAME :Punjabi Sahit da Itihas

Course Learning Outcomes:

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

Course Code: PUN102&202

COURSE NAME :Sahit Alochna de Sidhant

Course Learning Outcomes:

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

Course Code: PUN103&203

COURSE NAME :Punjabi Natak

Course Learning Outcomes:

1) Students will demonstrate an understanding of terms, themes, strategies, and issues of Punjabi Drama.
2) They can express their understanding of the relationship between Punjabi Drama and the historical/cultural contexts in which it was written.

3) They will be able to read and analyze drama of various periods and representing various points of view, including gender, ethnic identity and different cultures.

Course Code: PUN104&204

COURSE NAME :Adhunik Punjabi Kav

Course Learning Outcomes:

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

Course Code: PUN105&205

COURSE NAME :Adhunik Punjabi Galap

Course Learning Outcomes:

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

Semester III & IV

Course Code: PUN301&401

COURSE NAME: BhashaVigiyaan ate Punjabi Bhasha

Course Learning Outcomes:

1) Students will have advanced knowledge about Punjabi language and linguistics and insight into variation in various dialects of Punjabi language.
2) They will have in-depth knowledge of selected areas of linguistics, such as, language variation, language development, language learning.
3) They will have advanced knowledge of linguistic theory and research methods in general and corpus approaches in particular.
4) They will understand the phonology, morphology and syntax structure of Punjabi language.

Course Code: PUN302 and PUN402

COURSE NAME: Sabhiyachar ate Punjabi Sabheyachar and Lokdhara ate Punjabi Lokdhara

Course Learning Outcomes:

1) Students will demonstrate the knowledge of Folk-literature, Folk-traditions and customsrituals of Punjab.
2) Students will examine Punjab’s folklore and culture theoretically and will explore themselves by studying traces of Punjabi culture.

3) Students will be able to understand the current problems occurring in Punjabi society and can try to find the appropriate way to handle them.

Course Code: PUN303A&B and 403A&B

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

Course Learning Outcomes:

1) Students will be able to analyze major Medieval Guru Poets, their works and their representations of the human experiences.
2) Students will learn about ethics, ecology, social behaviours and concerns.
3) They will be able to meet the contemporary challenges and solutions.

Course Code: PUN304 And PUN 404

COURSE NAME : Punjabi Vaartak

Course Learning Outcomes:

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

Course Code: PUN305 &PUN405

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

Course Learning Outcomes:

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

B.A. (Punjabi)

Course Outcomes

B.A. course has major emphasis is given on its social aspects, origin,literature, grammar, etc alongside that how its literature,grammer,etc alongside that how its literature created with the commitment of numerous contemporary scholars,artists,vocalists and by other cultural loving people.

Punjabi Compulsory (B.A.I,II,III)

The main purpose of this course is to equip the students with the nuances of the Punjabi language which includes proficiency in grammar and its effective usage in speaking and writing.It further helps them to prepare for various competitive exams and to keep up with the increasing demand for Punjabi in Punjab society and at the global level.

Punjabi Elective (B.A.-I,II,III)

This subject expands the knowledge of the students about the major writers and their works in Punjabi literature.It equips them to compose sophisticated written works in various areas of literature along with the usage of literary devices.It also prepares them for postgraduate programs such as M.A.Punjabi.

Department of Geography
B.A. (Geography)

Course Outcomes

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

1) **Geomorphology: -** Explaining the Fundamentals of Geomorphology. They will understand the crustal mobility and tectonics, with special emphasis on their role in landform development. Establishing the relationships between landforms, processes, and underlying structure. They will overview and learn critical appraisal of landform development models.
2) **Climatology and Oceanography: -** Describing and analysing the concepts of Climatology and Oceanography. They will understand the dynamics of the Earth's atmosphere and global climate. Explaining approaches to climate classification and assessing the role of man in global climate change. Studying the behaviour and characteristics of the global oceans. They understand how the planetary and periodic wind and pressure belt related to each other. Also, they will understand how to develop the tropical cyclones, El Nino and La Nina.
3) **Geography of India: -** They can know about their own country's land formation, climate, and natural vegetation. They understand the economic resources of India. They understand the social distribution of population of their country. Develop an idea about regionalisation of India.
4) **Geography of Punjab: -** Explain the physical, administrative, and cultural divisions of Punjab. Describe the regional and seasonal variations of the Climatic regions of Punjab. Discuss the population growth and population Density. Solve the problems of growth of population.
5) **World Regional Geography: -** Know about the land formation, climate, and natural vegetation of the world regions. Understand the economic resources of World. They will learn the spatial distribution of population. Develop an idea about regionalization of World.
6) **Practical Techniques in Geography: -** Interpreting, reading, analysing, and identifying features from Geographical and Topographical Maps and apply this knowledge in ground surface. Constructing scales and representing geographical data through Cartograms. Identifying rocks and minerals and listing their properties. Drawing of maps with the help of

map projections. Using statistical techniques to summarize, represent, analyse, and interpret data. Conducting field excursions and preparation of field report on research on problem in different areas of India. Gain knowledge about Indian daily weather report That's help students to predict the weather report in future. They must know how prepare a project report based on any one field-based case study on weather, traffic flow, socio-economic problem. Students learn to use of various meteorological instruments and learn to interpret of the Indian daily weather report.

Department of Religious Studies
B.A. I,II,III (Sem 1 to 6)
Paper Code : (115,215,315,415,515,615)

Course Outcomes:

1) To analyse and to write on different religious topics at an advanced level.
2) Course will help to develop complex reading, writing and research skills.
3) Students will be able to express knowledge to interfaith and communal harmony in the society.
4) Students will manifest the knowledge of 'best practices' regarding, research,writing,teaching and the academic profession of religious academic studies.
5) Students will reveal an appreciation for literary theory.
6) This is a career oriented course. Students can enter various fields such as academicians, researchers, preachers and good religious leaders .
7) Students will have an in-depth understanding of the basic beliefs, practices, history, and sacred texts of at least eight major traditions of the student's choosing.
8) Students can utilize a variety of analytical concepts and hermeneutic methods from the humanities and social scienes.
9) Students can engage in public dialogue and debate regarding ethical and political issues related to religion.
10) Students can engage in constructive dialogue regarding the role religions play in public life in a modern democracy.
11) By the end of the course, students will be able to describe the origins and developments of some of the world's major living religions.
12) By the end of the course, students will be able to analyze and explain the terminology, theology, rituals and scriptures of different religions.

Department of Fine Arts
B.A. (Fine Arts)

Semester I & II

Course Outcomes

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

1) Apply theoretical knowledge of principles and concepts of Fine arts to practical problems.

2) Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
3) Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.

Semester III & IV

Course Outcomes

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

1) Apply theoretical knowledge of principles and concepts of Fine arts to practical problems.
2) Enhance skills to understand the concepts of principles, terminology of art and aesthetics.
3) Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.

Semester V & VI

Course Outcomes

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

1) Students will be able to develop their observation, imagination, creation and develop skills and sensitivity towards the use of visual elements for an effective work.
2) To impart knowledge of theoretical perspectives of art.
3) The range of experience covers two- and three-dimensional forms both the point of view of specially defined structural problems and their social and historic significance.

Department of English
B.A. Honours School in English

Course Outcomes

Semester I

BHE 101: CORE PAPER I BRITISH POETRY AND DRAMA: 14TH TO 16TH CENTURY

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

1) To understand the theme, structure and style of British poetry and drama.
2) To develop a skill to appreciate British poetry.

BHE 102: CORE PAPER II BRITISH POETRY AND DRAMA: 17th AND 18th CENTURY

1) Students will be able to understand the British poetry and drama in detail.
2) They would have grasped the major theme of satiric poems that belong to 17^{th}-18^{th} century.
3) They will understand the two significant weapons of satire i.e. irony and humour.

BHE 103: GENERIC ELECTIVE I (GE-I)

1) Students will be able to understand the importance of writing skills.
2) They will be able to know the word formation processes.

MEDIA AND COMMUNICATION SKILLS

1) The students will be able to understand the importance of media in communication processes.

2) It will create the social awareness among students.

Semester II

BHE 201: CORE PAPER III BRITISH LITERATURE (PROSE AND FICTION): 18TH CENTURY

1) Students will be learnt of appreciate the literary works through great writers.
2) They will understand the selection of human being with literature.
3) They will be able to appreciate literariness embedded into the text.
4) They would have gained insight into the growth and development of British literature.

BHE 202: CORE PAPER IV INDIAN WRITING IN ENGLISH

1) It will help the students to understand the various features of Indian literature in English.
2) To get a glimpse of the regional literatures translated in English.
3) To make the students aware of the superstitious practices prevalent in Indian society.
4) Students have understood how well the Indian culture is reflected in literature.

BHE 203: GENERIC ELECTIVE (GE II) ACADEMIC WRITING AND COMPOSITION

1) Students will be able to compose, edit and design the information.
2) They will be able to appreciate the beauty of language.

Semester III

BHE 301: CORE-V BRITISH ROMANTIC LITERATURE

1) It aims to acquaint the students with Romantic Period and some of its representative writers.
2) Students will understand the difference between reason and imagination, literature and revolution.

BHE 302: CORE-VI BRITISH LITERATURE: 19th CENTURY

1) To expose the students to the literature produced in Britain in the 19th century.
2) To enable the students to understand the existing conflict between faith and doubt in Victorian society.

BHE 303: CORE-VII WOMEN'S WRITINGS

1) To acquaint the students with the complex and multifaceted literature by women of the world.
2) Students will understand different forms of literature:poetry,fiction and short fiction.

BHE 304: SEC-I Soft Skills

To make the students communicate without being hesitant and ask for help and support when necessary.

BHE 305: GE-III Gender and Human Rights

To develop a basic understanding of human rights and create awareness regarding fundamental rights provided by the constitution of India.

BHE 306: AECC-IV Technical Writing

Technical Writing prepares students to design effective technical documents for both written and digital media, with particular emphasis upon technical memos, problem-solving and decision-making reports, and organizational, product-support, and technical-information webs. To support these writing tasks, the course provides an introduction to principles of research and documentation, drafting and revision processes, readability and accessibility of written texts.

Semester IV

BHE 401: CORE-VIII BRITISH LITERATURE: EARLY 20th CENTURY

1) To familiarize the students with new literature of Britain produced in the early decades of 20th century.
2) Students will also understand innovative techniques introduced by the writers of the 20th century.

BHE 402: CORE-IX INDIAN CLASSICAL LITERATURE

1) To introduce students to the major works of Indian classical dramatists.
2) To enable the students to appreciate Indian classical literature and to realize its value in practical aspects of life.

BHE 403: CORE-X AMERICAN LITERATURE

1) To provide a glimpse into social realism and American folklore and novel.
2) To develop a skill to appreciate American poetry.

BHE 404: SEC-II BUSINESS COMMUNICATION

To understand and demonstrate writing and speaking processes through invention, organization, drafting, revision, editing and presentation.

BHE 405: GE-IV LANGUAGE, LITERATURE AND CULTURE

To enable the students to apply theoretical knowledge into practice and to familiarize them with various aspects of language, literature and culture.

Semester V

BHE 501 CORE–XI MODERN EUROPEAN DRAMA B.A. HONOURS SCHOOL IN ENGLISH-III

Students will become familiar with modern European Drama in terms of topics, perspectives and dramatic literature. They will also get acquainted with the social and cultural contexts that inform about modern European drama. In addition, they will be acquainted with the diversified movements in post-modernist theatre.

BHE 502: CORE–XII POST-COLONIAL LITERATURE

Students will familiarize themselves with historical discourses of race and ethnicity in a variety of colonial and postcolonial contexts (North and South America, Africa, Asia and Europe), including comparative perspectives. They will learn about the ways in which literature shapes our ideas about society and social identities in interaction with other discourses (history, politics, science). Students will be able to enhance their skills of critical reading and writing.

BHE 503:DSE-I LITERARY CRITICISM

Literary criticism serves an illuminating purpose by making the students appreciate the beauty of great literature. They learn to understand political and social conditions described in works of literature. This course aims to develop students' ability to understand and criticize a literary piece. The course equips themwith knowledge of key forms and terminology of literary criticism.

BHE 504DSE-II PHONETICS OF ENGLISH

This course is intended to help the students to improve their English pronunciation.The course enables the students to learn the correct pronunciation of individual phonemes and words.The course focuses on helping students develop speech clarity and listening comprehension. Students will develop the knowledge and skills needed to be understood by native speakers and the ability to follow spoken language. They will practice English rhythm, stress, and emphasis pattern and will ultimatelyexperience a new way of learning pronunciation.

BHE 505GE V PSYCHOLOGY

The aim of the paper is to introduce students to the elementary aspects of psychology. It enables the students to deal with characters in texts,their perception of the world, miseries, desires, conflicts, individual and social concerns. Psychology also provides insight into literature by exploring mental processes.

Semester VI

BHE 601 Core XIII

EUROPEAN CLASSICAL LITERATURE

1) To introduce students to the historical background of the European classical literature.
2) To acquaint the students with various literary terms, its implementation and significance in European writings.
3) To make the students acquainted with the world-famous European classical writers and their literary output.

BHE 602 CORE XIV POPULAR LITERATURE

To provide the students witha taste of constituent works of popular literature in the English language and equip them to move beyond subjective or historical readings. The course will help to widen students' perception of the world around them and develop their abilities to be empathetic.

BHE 603 DSE-III LITERARY THEORY

To provide students with a base in the fundamentals of literary theory and criticism. The course aims to give an insight into the tradition of literary theory through the ages; the changes in literary approaches and criticism. It provides an understanding that literary theory and criticism enhance the study of literature.

BHE 604 DSE-IV PARTITION AND HOLOCAUST LITERATURE

To provide students witha socio-historical reading of the momentous event of partition in India. The course provides students with critical interpretations and literary readings of the trauma, guilt, silences and sufferings evoked by partition. It gives an introduction to the different perspectives on the concepts of borders, boundaries, nation and the atrocities and consequences of holocaust.

BHE 605 GE-VI PSYCHOLOGY

The aim of the paper is to introduce students to the elementary aspects of psychology. It enables the students to deal with characters in texts, their perception of the world, miseries, desires, conflicts, individual and social concerns. Psychology also provides an insight into literature by exploring mental processes.

B.A. (English)

Semester I

BA (ENG)-102 English (Communication Skills)

The chief objective of the paper is to sharpen the literary and grammar skills of the students. Selected short stories and poems have been incorporated in the syllabus to give impetus to creativity and imagination of the students. The syllabi will also help the students to understand the nuances of English language usage.

Semester II

BA(ENG)-202 English (Communication Skills)

The chief objective of the paper is to sharpen the literary and grammar skills of the students. Selected short stories and poems have been incorporated in the syllabus to give impetus to creativity and imagination of the students. The syllabi will also help the students to understand the nuances of English language usage.

Semester III

BA(ENG)-302 English (Communication Skills)

The chief objective of the paper is to sharpen the literary as well as grammar skills of the students. To give wings to the imagination of the students a book of selected short stories has been prescribed. Besides, to make the students understand the nuances of English language & usage a grammar book has also been incorporated.

Semester IV

BA (ENG)-402 English (Communication Skills)

The objective of the paper is to develop the empathy, compassion and the determination in the students through the study of classical literary work Oliver Twist. It further aims at enriching the communicative skills of the students to facilitate their exchange of ideas. The paper will also help the students in improving their written skills.

Semester V

BA (ENG)-502 English (Communication Skills)

The objective of the paper is to develop the critical thinking of the students through the study of modern drama. This paper also aims at honing the writing skills of the students. More emphasis is laid on the composition part to enrich the vocabulary, imagination and literary expressions of the students.

Semester VI

BA (ENG)-602 English (Communication Skills)

The objective of this paper is to enhance the interest of the students in various poetic forms through the study of prominent poems. This paper will also help in sharpening the writing skills and enrich the critical and textual knowledge of the students.

B.A. (English Literature)

Semester I

BA(ENL)-104 English Literature

An Introduction to the Study of Literature: Part 1

The objective of the paper is to introduce the students to the field of literature. The students shall learn the importance of literature, how it influences the society and vice-versa. At the entry level, the students will be introduced to the common literary terms, genres, captivating stories.

Semester II

BA (ENL)-204 English Literature

An Introduction to the Study of Literature: Part 2

The objective of the paper is to ignite the imaginative faculty of the students through the study of poetry and novel. The curriculum prescribed in this paper will enable the students to understand the fundamental concepts relating to poetry and fiction. It will also develop an inclination of the students towards literature.

Semester III

BA (ENL)-304 English Literature

English Literature from Chaucer to the Eighteenth Century

The objective of the paper is to introduce the students to literary terms, prominent texts and literary characteristics of different ages. The study of the texts prescribed will develop the understanding of the students regarding the socio-culture, socio-political and socio-economic aspects of different eras.

Semester IV

BA (ENL)-404 English Literature

Literary Masterpieces: Study of the Classics - I

The objective of teaching this paper is to introduce the students with the Literary Masterpieces. Although the literary world is enormous and it is impossible to cover the masterpieces under one entire paper, yet an attempt has been made for fostering literary acumen among the students by including some celebrated literary masterpieces in this paper.

Semester V

BA (ENL)-504 English Literature

Poetry and the History of English Literature

The main objective of this paper is to enhance the interest of students in literature and particularly to inculcate the basic understanding of various types of poetic forms. Through the curriculum of this paper, an effort is also made to acquaint the students with the history of English Literature. In addition, the students will have to study some prominent texts to ameliorate their literary skills.

Semester VI

BA (ENL)-604 English Literature

Literary Masterpieces: Study of Classics-II

The objective of teaching this paper is to introduce the students with the Literary Masterpieces. Although the literary world is vast and it is impossible to cover the masterpieces in one paper, yet an attempt has been made for fostering literary sensibility among the students by including some celebrated literary masterpieces in this paper.

M.A. (English)

Course Outcomes:

MAE 011 Literature and Modernity

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

MAE 012 Twentieth Century Poetry and Fiction

1) The students will be able to comprehend the variations in the form and content of fictional and poetical works.
2) The students will be able to appreciate and understand the paradigm shift in the field of poetry and fiction.
3) The students will be able to deduce the difference between the concepts of existentialism and utilitarianism.

MAE 013 Literature and Postcoloniality

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

MAE 014A Literature and Gender

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

MAE 014B Creative Writing

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

MAE 014C Modern Indian Literature in Translation

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

MAE 015 Seminar

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

MAE 016 Literary and Cultural Theory

1) Students will get acquainted with the principal literary theories.

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

MAE 017 European Drama

1) Students will develop a broader knowledge of human ideas, beliefs and social values through the study of prescribed European literary texts.
2) Students will understand the European style, form and content of writing.
3) Students will get acquainted with general trends in European literature over the ages.

MAE 018 American Literature

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

MAE 019A Literature and Politics

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

MAE 019B Literary Non-Fiction

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

MAE 019C Indian Writing in English

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

MAE 020 Seminar

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

Department of History
M.A.(History)

Course outcomes

Semester I

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

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

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

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

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

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

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

To introduce the students about history of china and japan

Semester II

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

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

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

To introduce the students about world history.

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

To introduce the students about world history.

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

To introduce the students about history of china and japan.

Semester III

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

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

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

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

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

To introduce the students about British history in India.

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

To introduce the students about National movement in India.

Semester IV

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

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

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

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

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

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

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

To introduce the students about National movement in India

Department of Defence Studies
B.A. (Defence Studies)

Course Outcomes

Semester I

Def-113: War and its Various Aspect

Outcomes

1) Origin of War fare and necessity of it.
2) Students understand information on historical development of warfare.

Semester II

Def-213: Theoretical Dimensions of Warfare

Outcomes

1) Scope and theater of warfare
2) Able to understand the need war to fulfill our will.

Semester III

Def-313: Evolution of warfare

Outcomes

1) Grasping the effectiveness of western warfare their tactics and strategy.
2) Able to understand the old weapons their use

Semester IV

Def-413: Evolution of warfare in India

Outcomes

1) To enhance the analytical skills of the student towards understanding the developments in the warfare of India.
2) To introduce the student to the art of war and Drawing the small Charts related to the Battles .

Semester V

Def-513: National security of India.

Outcomes

1) Identify problems faced by India (Internal as well as external)
2) Evaluate the role of DPSU in growth of Defence.

Semester VI

Def-613: Regional security

Outcomes

1) Evaluate the role of International relation and economic growth.
2) Analyze the performance of Trade and security policies and their effects on human deprivation in developing.

Department of Physics
Bachelor of Science (Honors) Physics

Semester I & II

PHY-1.1.1: MATHEMATICAL PHYSICS – I

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

Course learning outcome:

Students will have achieved the ability to:

1) Concept of limit and continuity
2) Intuitive ideas of continuous, differentiable functions
3) Describe the partial differential equations and its applications
4) Solve various problems of vector integration

PHY-1.1.2: MECHANICS

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

Course learning outcome:

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

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

PHY-1.2.1: ELECTRICITY AND MAGNETISM

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

Course learning outcome:

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

PHY-1.2.2: WAVES AND OPTICS

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

Learning Outcomes:

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

Semester III & IV

PHY-2.1.1: MATHEMATICAL PHYSICS – II

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

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

1) Use of Fourier series in various problems
2) Use and solution of Legendre and Bessel polynomials
3) Describe special function and their recurrence relations
4) Explain beta and gamma functions
5) Explain the error theory and its various laws
6) Describe the partial differential equations and its applications

PHY-2.1.2: THERMAL PHYSICS

Course Objectives:

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

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

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

PHY-2.1.3: ANALOG SYSTEMS AND APPLICATIONS

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

Course learning outcome:

Students will have achieved the ability to:

1) To understand fundamentals of semiconducting diodes, rectifier diodes, zener diode and applications.
2) To understand about Bipolar Junction Transistor.
3) To understand basic function of single stage amplifier, multistage amplifier and power Amplifier and their working principle.
4) To understand basic construction of feedback circuits and their application in oscillators
5) To understand basic amplifier and oscillator circuits and their application in analog circuits.
6) To understand operational Amplifier and its applications.

SKILL ENHANCEMENT COURSE-1

PHY-2.1.4: RADIATION SAFETY

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

Course learning outcome:

1) Be aware and understand the hazards of radiation and the safety measures to guard against these hazards.
2) Have a comprehensive knowledge about the nature of interaction of matter with radiations like gamma, beta, alpha rays, neutrons etc. and radiation shielding by appropriate materials.
3) Know about the units of radiations and their safety limits, the devises to detect and measure radiation, such as the Geiger-Mueller counter and scintillation counters.
4) The students are expected to learn radiation safety management, biological effects of

ionizing radiation, operational limits and basics of radiation hazards evaluation and control, radiation protection standards, 'International Commission on Radiological Protection' (ICRP) its principles, justification, optimization, limitation, introduction of safety and risk management of radiation. Nuclear waste and disposal management, brief idea about 'Accelerator driven Sub-Critical System' (ADS) for waste management.

5) The students are expected to do various experiments based on radiation safety.

PHY-2.2.1: QUANTUM MECHANICS

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

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

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

PHY-2.2.2: SPECTROSCOPY

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

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

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

PHY-2.2.3: DIGITAL SYSTEMS AND APPLICATIONS

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

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

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

SKILL ENHANCEMENT COURSE-2

PHY-2.2.4: APPLIED OPTICS

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

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

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

Semester V & VI

PHY-3.1.1: NUCLEAR PHYSICS

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

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

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

PHY-3.1.2: SOLID STATE PHYSICS

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

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

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

PHC-3.1.3: MEDICAL PHYSICS

Course Objective:

1) Focus on the application of Physics to clinical medicine.
2) Gain a broad and fundamental understanding of Physics while developing particular expertise in medical applications.

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

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

1) Explain about the human body, its anatomy, physiology and Bio-Physics, exploring its performance as a physical machine.
2) Explain various diagnostic tools, medical imaging techniques, how ionizing radiation interacts with matter, how it affects living organisms and how it is used as a therapeutic technique and radiation safety practices
3) Know about need for radiological protection and the sources of an approximate level of radiation exposure for treatment purposes.

PHY-3.1.4: CLASSICAL DYNAMICS

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

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

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

PHY-3.2.1: ELECTROMAGNETIC THEORY

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

Course learning outcome:

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

PHY-3.2.2: STATISTICAL MECHANICS

Course Objective: The Statistical Mechanics deals with the derivation of the macroscopic parameters (internal energy, pressure, specific heat etc.) of a physical system consisting of large number of particles (solid, liquid or gas) from knowledge of the underlying microscopic behavior of atoms and molecules that comprises it. The main objective of this course work is to introduce the techniques of Statistical Mechanics which has applications in various fields including Astrophysics, Semiconductors, Plasma Physics, Bio-Physics, chemistry and in many other directions.

Course learning outcome:

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

PHY-3.2.3: LASER PHYSICS

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

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

1) Understand the basic interaction phenomenon
2) find the interrelations between Einstein coefficients
3) concept of line broadening
4) predict fundamental characteristics of laser systems
5) Understand the basic holography and optical fiber communication
6) solve the rate equations in steady state for a laser
7) describe the major examples of laser systems
8) Understand the basics of optical fiber
9) Basics of its different applications viz. holography & non-linear optics

PHY-3.2.4: PARTICLE PHYSICS AND ACCELERATORS

Course Objectives: To impart knowledge about basic Particle Physics and various Accelerators.
Course learning outcomes: Students will have achieved the ability to:

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

Master of Science (Physics)

Semester I

PH-1.1.1: MATHEMATICAL METHODS OF PHYSICS - I

Course Objective: The course will cover some mathematical techniques commonly used in physics. The focus of the course is not on pure mathematics, but rather on the application of mathematics to problems of interest in the physical sciences.
Course learning outcome: On successful completion of this course, students will be able to:

1) Understand the concept and uses of Beta and Gamma function.
2) Understand the concept of special functions like Legender's function and Bessel Function and there applications ib physical problems.
3) Understand the concept of Tensors and Einstein's notations.
4) Applications of various numerical methods and applications in Physics.

PH-1.1.2: CLASSICAL MECHANICS

Course Objective: The purpose of the course is to train the students in the Newtonian Mechanics. Lagrangian and Hamiltonion formalisms to an extent that they can use these in the modern branches of Physics.
Course learning outcome: On successful completion of this course, students will be able to:

1) Understand the concept of virtual work and displacement and D' Albert Principle.
2) Understand the concept of Lagrange's equations of motion.
3) Understand the Hamiltonian equations of motion.
4) Acknowledge the concept of Poisson brackets and Canonical transformations.

PH-1.1.3: CLASSICAL ELECTRODYNAMICS

Course Objectives: To apprise the students regarding the concepts of electrodynamics and Maxwell equations and use them various situations.
Course learning outcomes: Students will have achieved the ability to:

1) Explain Coulomb's Law, Electric Field, Gauss's Law and its applications
2) Explain Boundary Values Problems, Bound Charges and Bound Charge Densities.

3) Use Maxwell equations in analyzing the electromagnetic field due to time varying charge and current distribution.
4) Describe the nature of electromagnetic wave and its propagation through different media and interfaces.
5) Explain charged particle dynamics and radiation from localized time varying electromagnetic sources.

PH-1.1.4: QUANTUM MECHANICS

Course Objective:

1) To study the basic principles of quantum mechanics.
2) Explain the operator formulation of quantum mechanics.
3) Student will learn the concept of wave function.
4) Student will learn Schrodinger equation and their applications.
5) To study role of uncertainty in quantum Physics.

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

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

PH-1.1.5: ELECTRONICS-I

Course Objectives: The course has been designed:

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

Semester II

PH-1.2.1: MATHEMATICAL METHODS OF PHYSICS – II

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

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

1) Understand the concept and uses of Laplace Transform.
2) Understand the concept of special functions like Hermite function and Laguerre Function and there applications in physical problems.
3) Understand the concept of Fourier series and transform.
4) Applications of partial differential equations and Group theory in Physics.

PH-1.2.2: ADVANCED CLASSICAL MECHANICS & ELECTRODYNAMICS

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

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

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

PH-1.2.3: ADVANCED QUANTUM MECHANICS

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

Course Outcomes:

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

PH-1.2.4: STATISTICAL MECHANICS

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

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

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

PH-1.2.5: ELECTRONICS– II

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

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

Department of Chemistry

M. Sc. Chemistry

Course Outcomes

PAPER MC 101: INORGANIC CHEMISTRY -I

1) To enable students to gain the basic knowledge of Bio-inorganic chemistry.
2) To equip students with the knowledge of Transition Metal Bond Theories.
3) To give basic information of Orgel/Tunabe-Sugano Diagrams.

PAPER MC 102: ORGANIC CHEMISTRY -I

1) To enable students to develop a comprehensive knowledge of various types of reactions, mechanisms and intermediate species involved in organic reactions.
2) To render students capable of understanding and deducing products and mechanism of unknown reactions.
3) To develop the basic knowledge of the rich chemistry and properties of Aromatic/Anti Aromatic/Non Aromatic compounds and their interactions with various species through non-bonding interactions.

PAPER MC 103: PHYSICAL CHEMISTRY- I

1) To acquaint the students about the basic concepts involved in first and Second law of thermodynamics and to calculate the change in Entropy and free energy.
2) To provide an insight about activity, fugacity and partial molal properties and their determination by using various methods.
3) Students will be able to demonstrate and realize the importance of chemistry in living systems, such as students will study coupled reactions and metabolism, free energy utilization in metabolism etc.
4) The subject will provide the students the basic knowledge of statistical thermodynamics, partition function and expressions of thermodynamic properties in terms of partition function.
5) The subject will impart fundamental knowledge about the basic concepts of Electrochemistry such as Born model of ion-solvent interactions, Debye-HuckelOnsagar theory, Electrical double layer theory, etc.
6) The students will learn about Electrochemical systems of energy production, Electrochemical processes of surface treatment and also about corrosion and its protection methods.

PAPER MC 104A: Mathematics for Chemist

The students will be taught about various types differentiation and integration methods to be used in Chemistry to solve various theoretical derivations.

PAPER MC 104B: Biology for Chemist

1) The students will be taught about the origin of life and different types of cells and their organelles in different living organisms.

2) The course will provide the indepth knowledge of important biomolecules of life viz. carbohydrates, proteins, lipids, nucleic acids (DNA/RNA) and enzymes.
3) To deliver the basic knowledge of various metabolic pathways involved in energy generation.

PAPER MC 105: INORGANIC CHEMISTRY LAB

1) The students will be able to learn the preparation methods of coordination complexes.
2) They will be able to record the UV-Vis and IR spectra of synthesised complexes
3) They will be able to estimate the metal and ligand present in the prepared complex.

PAPER MC 106: ANALYTICAL CHEMISTRY LAB

1) The course will enable the students to demonstrate the complex metric titrations of various samples
2) They will be able to determine the calcium & magnesium content in different samples.
3) To develop skills in conductometric, potentiometric, pH-metric and colorimetric titration, which will have many applications in various industries.

PAPER MC 201: INORGANIC CHEMISTRY -II

1) To acquaint the students basic understanding of the chemistry of Main Group elements with special emphasis on bonding and structure.
2) Students will get an insight into Cluster compounds, their importance and applications.
3) To provide basic idea of applying symmetry elements, symmetry operations and find point groups of molecules.
4) Students will learn how the various physical aspects can be derived from symmetry.
5) To provide an insight into the applications of group theory as in various spectroscopic techniques like IR, Raman Spectroscopy.

PAPER MC 202:ORGANIC CHEMISTRY -II

1) To introduce students with various terms and conceptsincluded in Organic Stereochemistry.
2) To enable students to solve stereochemistry related problem through practice.
3) To equip students with the basic knowledge of pericyclic reactions and the various approaches involved for deducing the mode of pericyclic reactions.

PAPER MC 203: PHYSICAL CHEMISTRY- II

1) In this course on physical chemistry, students will be introduced to fundamental principles and modern aspects of Quantum and kinetics chemistry.
2) Students will study basic postulates of quantum mechanics, setting up of operators for different observables. Students will also get and insight about to solve the simple quantum mechanical models, such as particles in 1D, 3D, Harmonic oscillator, rigid rotor, Hydrogen atom, etc.
3) To equip students to understand the approximation methods: Variation and perturbation and

their applications for Helium atom.

4) The subject will also provide an insight about Huckel Molecular orbital Theory of conjugated systems, like ethylene, butadiene, cyclopropenyl radical and cyclobutadiene system.
5) Students will be able to explain the theoretical basis of quantum chemistry, and critically examine/interpret the theories/principles, compare various approximate formalisms and their validity in explaining experimental phenomena
6) To have an idea about Rate of reaction, order and molecularity of reaction and to learn the different theories of rate of reaction and factors affecting reaction rates.
7) Students will understand thoroughly the concept of different type of catalysis,
8) Michaelis-Menten mechanism for enzyme catalysis and various type of complex reactions.

PAPER MC 204: COMPUTER FOR CHEMIST (THEORY & PRACTICAL)

To develop a basic knowledge of Computer (C++ language) to Chemistry Students through theory and practicals.

PAPER MC 205: ORGANIC CHEMISTRY LAB

1) The student will be able to learn importance of reaction conditions for a particular reaction and their mechanism.
2) The student will be able to learn regarding set up the apparatus for the purification, isolation, synthesis and characterization of certain compounds

PAPER MC 206:PHYSICAL CHEMISTRY LAB

1) Demonstrate knowledge of visometer and stalgamometer to find the viscosity and surface tension of various liquids. They will also learn to find densities of various liquids using Pykometer.
2) Students will learn to find the refractivity of various alcohols and other liquids.

PAPER MC 301:ANALYTICAL CHEMISTRY

1) The students will be able to explain the fundamentals of analytical chemistry, steps of a characteristic analysis, express the role of analytical chemistry in science, Compare qualitative and quantitative analysis.
2) The students will be able to estimate kinds of errors and their sources in chemical analysis. Evaluate the effects of systematic errors on analytical results. Compare of the experimental mean with a true value and two experimental means.
3) The student will be able to explain the theoretical principles of instrumental techniques of electroanalytical, spectrometric/spectrophotometric, thermo analytical and main components in such analytical instruments.
4) The student will be able to explain the theoretical principles of various separation techniques such as solvent extraction, ion exchange chromatography, and their applications in analytical chemistry.

PAPER MC 311 LIGAND FIELD THEORY

1) This course will enable the students to learn bonding, orbital arrangement, and other characteristics of coordination complexes.
2) Students will be able to find out term symbols & total possible arrangements in any electronic configurations.
3) This Enable the students to know about how orbital of metal is effected by ligand & how the electron present in metal ions effected by nature of ligand.

PAPER MC 312: REACTION MECHANISM OF TRANSITION METAL COMPLEXES

1) To learn about ligand replacement reaction by using the knowledge of labile and inert complexes and substitution reaction of octahedral and square planar complexes and other different reactions.
2) To learn about reaction of square complexes with the help of ligand displacement reactions.
3) To learn about metal carbonyl reactions of octahedral with the help of dissociative and associative substitution mechanism reactions.
4) To learn about different Electron transfer processes through outer sphere and inner sphere mechanism, Two electron transfer reactions and replacement through redox mechanism.
5) To learn about oxidative addition and migration reactions by using acid base behaviors of metal atom in complexes, oxidative addition reaction, reductive elimination and by insertion reaction
6) To learn about stability constants of metal complexes by using different methods like slope ratio method solubility method and Ion exchange method etc.

PAPER MC 313: INORGANIC SPECTROSCOPY –I

1) The students will get a deep insight into the various spectroscopic methods used for the characterization of various compounds.
2) To study molecular interactions by choosing suitable spectroscopic methods & interpreting corresponding data.
3) To study the origin, instrumentation & important applications of IR, Raman, Mossbauer techniques.
4) The students will be able to analyze the NQR data for chemical analysis.
5) They will be able to explain the principle, instrumentation & application of Mossbauer Spectroscopy to study bonding in Iron derived complexes.

PAPER MC 314: INORGANIC CHEMISTRY PRACTICALS –I

1) The students will be able to synthesize the different inorganic complexes and also find their purity.
2) To be able to estimate the metal and ligand present in the prepared complexes and also learn about their bonding.
3) They will be able to know about preparation of exact solutions for quantitative analysis.

PAPER MC 315: INORGANIC CHEMISTRY PRACTICALS –II

1) The students will be able toperform Ion-exchange chromatography for separation of ions and study about their Rf values.
2) To understand the Spectrophotometric determinations of Fe (II), Fe (III), Ni (II) and Cu (II) with their suitable ligands.
3) Students wil be able to handle instruments like colourimeter, conductometer, spectrophotometer etc.

PAPER MC 321:PHOTOCHEMISTRY AND PERICYCLIC REACTIONS

1) To provide students a detailed knowledge about various types of transitions, their selection rules, molecular orbital views in organic compounds.
2) To apply the frontier and perturbation molecular orbital theories to various pericyclic reactions.
3) To give the comprehensive knowledge of the photochemical reactions of functional group including olefins, dienes, carbonyls, enones, isolated dienes, conjugated dienes and aromatic compounds.

PAPER MC 322:CHEMISTRY OF NATURAL PRODUCTS

1) The students will get a deep insight into chemistry of secondary metabolites like Alkaloids, Steroids, Terpenoids
2) Students will learn general methods and techniques of structure elucidation of complex natural compounds.
3) Get to know the alternative sources of natural compounds, which can finally led to more useful and potent drug.
4) Yet another area of acquaintance concerns the way in which compounds are synthesized biologically.

PAPER MC 323:HETEROCYCLIC CHEMISTRY

1) The students will learn naming heterocycles using various methods of nomenclature.
2) The students will learn the properties and synthesis of various heterocyclic rings (three, four, five and six)
3) The students will be made familiar reactions involving molecular rearrangements.

PAPER MC 324:ORGANIC CHEMISTRY PRACTICALS –I

1) To enable students with the potential to understand and carryout the various techniques to synthesize, purify and characterize Organic Compounds.
2) To equip students with the confidence to design and synthesize given organic compounds through multistep synthesis methodology.

PAPER MC 325:ORGANIC CHEMISTRY PRACTICALS –II

To develop basic knowledge and carry out various types of titrimetric analysis of organic compounds for their purity, including estimation of carbohydrates, amines, phenols,

preserving agents such as salycilates and benzoates.

PAPER MC 331: FUNDAMENTALS OF SPECTROSCOPY

1) To gain advanced knowledge about the interactions of electromagnetic radiation and matter and their applications in spectroscopy. Be able to apply formalisms based on molecular symmetry to predict spectroscopic properties.
2) Be able to analyze and interpret spectroscopic data collected by the methods discussed in the course. Be able to solve problems related to the structure, purity and concentration of chemicals and to study molecular interactions by choosing suitable spectroscopic methods and interpreting corresponding data.
3) To know the basics principle of different techniques employed in molecular spectroscopy. To study the origin, instrumentation and important applications of Microwave, IR, Raman, UV, NMR, NQR, ESR and EQR techniques.

PAPER MC 332: STATISTICAL THERMODYNAMICS

1) Explain statistical physics and thermodynamics as logical consequences of the postulates of statistical mechanics;
2) Apply the principles of statistical mechanics to selected problems.
3) Apply techniques from statistical mechanics to a range of situations.
4) Use the tools, methodologies, language and conventions of physics to test and communicate ideas and explanations.
5) To study the concept of thermodynamic probability. To learn the Maxwell – Boltzmann, Fermi – Dirac and Bohr's Einstein statistics.
6) Comparison and applications and to know about the Partition functions.
7) Explain salient features of irreversible processes and Onsager relations.

PAPER MC 333: FUNDAMENTAL AND ATMOSPHERIC PHOTOCHEMISTRY

1) To acquire knowledge of photochemistry, like the basic laws of photochemistry;Grothus& Draper law, law of photochemical equivalence and law of absorption (Lambert Beer's law).
2) To describe and explain photochemical and photophysical processes using Jablonski diagramand their quantum yield expressions.
3) To study the selection rules for electronic transitions and develop quantum mechanical formulation of Franck-Condon principle.
4) Apply knowledge to analyze and develop photoactive systems and the reactivity of excited states to explain applications in photochemical energy conversions.
5) Understand the working principle and use of the simplest photochemical techniques and apply the knowledge in industries, such as for optical bleaching of textiles and papers, for electron and energy transfer processes and in photochemical synthesis of detergent and insecticides.
6) Demonstrate knowledge about structure of atmosphere in terms of temperature, composition, diffusion and ionization and thereby acquire knowledge about chemistry of upper atmosphere.

7) Recognize different types of toxic substances in the environment and apply the basic chemical concept to analyze chemical processes involved in different environmental problems and to learn control methods.

PAPER MC 334:PHYSICAL CHEMISTRY PRACTICALS –I

Demonstrate knowledge of spectrophotometer and polarimeterpracticals.

PAPER MC 335: PHYSICAL CHEMISTRY PRACTICALS –II

Demonstrate knowledge of kinetics, phase rule and thin layer chromatography practicals.

PAPER MC 401: ENVIRONMENTAL CHEMISTRY

The students will acquire the knowledge regarding

1) Different concepts of atmosphere, stratospheric and tropospheric chemistry, photochemical smog, acid rain, global warming.
2) Different types of environmental pollution (air, water and soil pollution), various reactions involved, and different monitoring techniques used to analysing the pollutants.
3) Principle and working of instrumental techniques(IR, AAS, FES, Chromatographic techniques etc.

PAPER MC 411: CHEMISTRY OF ORGANOMETALLIC COMPOUNDS

1) To know and understand the different properties and structures for organometallic compounds from different parts of the periodic table and their trends.
2) To know principal synthetic routes to various classes of organometallic compounds. Organometallic compounds are very important in biological bodies like haemoglobin, chlorophylls, Vitamin B12 and also they can be used as chemical reagent.
3) This course give knowledge about the synthesis and properties of these organometallics

PAPER MC 412: ADVANCED TOPICS IN INORGANIC CHEMISTRY

1) Describe bonding models that can be applied to a consideration of the properties of transition metal organometallic species with a wide range of ligands.
2) They will be able to understands various aspects of radioactivity & applications of radioactive elements in exchange reactions.
3) Learn about the background on Nanoscience .Understand the synthesis of nanomaterials and their application and the impact of nanomaterials on environment.
4) Apply their learned knowledge to develop Nanomaterials

PAPER MC 413: INORGANIC SPECTROSCOPY-II

1) The students will study the detailed concepts of HNMR spectroscopy, Mass spectroscopy, ESR Spectroscopy.
2) Enable the students to interpret the structure of compounds by analyzing the spectral data.
3) The students will get a deep insight into the concept of ORD and CD
4) To impart the students thorough idea of applications of NMR.

5) They will learn to determine stochiometry of Metal Ligand complexes by Job's method.
6) Have achieved advanced knowledge about the of NMR Spectra of Transition metal ion complexes.

PAPER MC 414: INORGANIC CHEMISTRY PRACTICAL- I

1) To provide experimental skills to students onto preparation of coordination compounds and estimating the amount of metal and ligands in these compounds.
2) Apply the knowledge of quantitative analysis for the determination of metals form water and alloys.
3) They will be able to understand the stereochemistry of synthesized compounds.

PAPER MC 415: INORGANIC CHEMISTRY PRACTICAL- II

1) The lab course will enhance the skill of stoichiometric determination of various complexes by Job's and Mole-Ratio method.
2) To study the oscillator strength and assignments of d-d bands to transitions in the UV-Vis spectra of transition metals.
3) They will be able to verify the relative positions of various ligand in spectrochemical series and also learn to practically calculate 10 Dq and beta values for hexa aqua ion of Ni (II).
4) Students will Learn to handle IR spectrometer and how to get IR spectra of various inorganic complexes .

PAPER MC 421: APPLICATIONS OF ORGANIC MOLECULAR SPECTROSCOPY

1) The students will get a deep insight into the various spectroscopic methods used for the characterization of organic compounds.
2) They will be able to elucidate the structure of compounds by analysing the spectral Data.
3) The students will study the concepts of 1H NMR, 13 C NMR Spectroscopy and 2D NMR techniques.
4) They will know UV, IR techniques.
5) They will study mass spectrometry: Instrumentation, various methods of ionization. Different detectors rules of fragmentations of different functional groups.

PAPER MC 422:ORGANIC SYNTHESIS

1) To introduce students with the various organic reagent used in Organic Synthesis.
2) To euip students to deduce a valid synthesis of any Organic Molecule using various concepts of Disconnection Approach.
3) To render students efficient enough to solve all Organic reactions related problems through practice.

PAPER MC 423: MODERN SYNTHETIC REACTIONS &REARRANGEMENTS

1) The students will be taught the various types of rearrangement reactions and their mechanisms.

2) To give a basic knowledge of various named reactions and their mechanism.

PAPER MC 424: ORGANIC CHEMISTRY PRACTICALS –I

To give the basic idea and methodology of protection, deprotection, ring enlargement, cyclization, reduction, oxidation using multistep synthesis of organic compounds with varied functionality.

PAPER MC 425: ORGANIC CHEMISTRY PRACTICALS –II

1) To aware the students about spectrophotometric analysis of carbohydrates, asprin, caffeine, amino acids, and ascorbic acids.
2) To equip students with the efficiency to handle separation of bioorganic compounds through paper chromatography.

PAPER MC 431: X-RAY DIFFRACTION & OTHER TECHHNIQUES

1) To get an overview about the structure and properties of solid crystals and liquid crystals. To know the characterization of crystals using X-Ray diffraction. To learn the important aspects of gaseous state and electrochemistry.
2) To study the principle, instrumentation and applications of diffraction method. • To understand, band model theory for metals Intrinsic and impurity semiconductor. To understand laser maser and their types. Be able to apply formalisms based on molecular symmetry to predict spectroscopic properties.
3) Be able to analyze and interpret spectroscopic data collected by the methods discussed in the course. Be able to solve problems related to the structure, purity and concentration of chemicals and to study molecular interactions by choosing suitable spectroscopic methods.
4) To impart a thorough knowledge of the CD AND ORD.To study the origin, instrumentation and important applications of mass spectrometry, Photoelectric effect, Mossbauer spectroscopy, Flame photometry, Refractometry, CD and ORD.

PAPER MC 432: BIO-PHYSICAL CHEMISTRY & ADVANCED SPECTROSCOPY

1) To impart the students concepts of the fundamentals of spectroscopy and its applications in the study of structure of atoms, bonding in molecules and molecular spectroscopy.
2) To impart a thorough knowledge of the fundamentals of mass spectrometry, AES, PES, AES, Photoelectric effect, Mossbauer spectroscopy, Flame photometry, Refractometry, CD and ORD.
3) To study the origin, instrumentation and important applications of mass spectrometry, AES, PES, AES
4) To understand, band model theory for metals Intrinsic and impurity semiconductor. To understand laser maser and their types.

PAPER MC 433: POLYMER & SURFACE CHEMISTRY

1) To acquire knowledge about essential descriptions about polymer chemistry, such as

Classification and nomenclature of polymers, their composition and polymerization mechanism.

2) Elaborate on step-growth and chain polymerization, with respect to their mechanism and kinetics.
3) Estimate the number- and weight-average molecular masses of polymer samples given the degree of polymerization and mass fraction of chains present.
4) Demonstrate the knowledge about molecular weight determination by osmotic method, light scattering method, sedimentation method, diffusion constant, sedimentation equilibrium, viscosity method.
5) To understand the knowledge of adsorption process and influence of temperature and pressure on adsorption process.
6) Describe the assumptions and derivations of various adsorption isotherms and explain how the specific adsorption isotherm could be used for the surface area determination of different materials.
7) To learn about catalysis and compare & contrast homogeneous and heterogeneous catalysis.
8) To get an overview about spectroscopic methods like PES, AES, LEED for the determination of surface structure and also study the important applications of surface chemistry and various concepts like, surfactant, wetting, micelles, detergency, surface tension, interfacial tension.

PAPER 434: INSTRUMENTAL PHYSICAL CHEMISTRY PRACTICALS-II

Demonstrate the practicals of conductance, pH meter, potentiometer.

PAPER 435: PHYSICAL CHEMISTRY PRACTICALS-II

Demonstrate the practicals of spectroscopy, CMC.

Department of Computer Science
BCA

Semester I

BCA-113 Fundamentals of Information Technology

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

BCA-114 Web designing using HTML

1) Recognize the components of an HTML file and create such a file
2) Understand the principles of creating an effective web page
3) Link to local files and Web pages from their Web pages.

4) Become familiar with graphic design principles (Add graphics and sound to their Web pages using HTML).
5) Learn the language of the web: HTML and CSS.

BCA-115 (E1) E-Commerce

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

Semester II

BCA-123 Programming Fundamentals using C

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

BCA-124 Operating System

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

BCA-125 (E1) Computer System Architecture

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

Semester III

BCA-201 Object Oriented Programming using C++

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

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

BCA-202 Data Structure

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

BCA-203 Relational database Management system with oracle

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

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

BCA-204 Software Engineering

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

Semester IV

BCA-211 Computer Networks

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

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

BCA-212 Programming using Java

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

BCA-213 System Software

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

BCA-214 Adobe Photoshop

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

BCA-215(E1) Digital Electronics

1) Convert different type of codes and number systems which are used in digital communication and computer systems.
2) Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.
3) Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.
4) Able to design multiplexers, demultiplexers, encoders, decoders and Flip Flops.

Semester V

BCA-312 System Analysis and Design

1) To determine specific needs of system.
2) Discuss approaches and tasks of system.
3) Evaluate tools and techniques.
4) Use appropriate methods and techniques to design software.

BCA-313 System Software

1) Distinguish between Operating Systems software and Application Systems software.
2) Describe commonly used operating systems.
3) Identify the primary functions of an Operating System.
4) Distinguish between Operating Systems software and Application Systems software.
5) Describe commonly used operating systems.
6) Identify the primary functions of an Operating System.
7) Able to understand the concepts and working of assemblers, compilers, macro processors and various software tools.

BCA-314 Java Programming

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

BCA-315 Web Designing using HTML and DHTML

1) Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.
2) Become familiar with graphic design principles that relate to web design and learn how to implement theories into practice.
3) Develop skills in analyzing the usability of a web site.
4) Learn the language of the web: HTML,DHTML and CSS.
5) Able to create interactive forms.
6) Understand the basics concepts of Server side programming.

Semester VI

BCA-322 E-Commerce

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

BCA-323 Operating Systems

1) To understand the main components of an OS & their functions.

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

BCA-324 Software Engineering

1) Basic knowledge and understanding of the analysis and design of complex systems.
2) Ability to apply software engineering principles and techniques.
3) Ability to develop, maintain and evaluate large-scale software systems.
4) To understand efficient, reliable, robust and cost-effective software solutions.
5) Ability to perform independent research and analysis.

BCA-325 Web Designing using ASP.NET

At the end of the course the participant will

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

B.Sc. (H) AI & DS

Course Outcomes

Semester I

BSCHAI-113 Computer Fundamentals

Students will learn:

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

BSCHAI-114 Problem Solving and Programming in C

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

6) Demonstrate the use of algorithms and flowcharts to plan the solution of a computing problem.
7) To be able to work with Files.

BSCHAI-115 Introduction to Artificial Intelligence

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

Semester II

BSCHAI-121 Introduction to Data Science

By the end of this course, students will:

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

BSCHAI-122 Object Oriented Programming Concepts using C++

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

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

BSCHAI-123 Data Structures

This course will help the students to:

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

BSCHAI-124(iii) Digital Marketing (Open Elective-II)

On successful completion of this module, the learner will be able to:

1) Explain the role and importance of digital marketing in a rapidly changing business landscape.
2) Discuss the key elements of a digital marketing strategy
3) Illustrate how the effectiveness of a digital marketing campaign can be measured.
4) Demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs

Semester III

BSCHAI-132 Problem Solving and Programming in Python

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

BSCHAI-133 Fundamentals of DBMS

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

Semester IV

BSCHAI-142 Data Analysis using Python

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

BSCHAI-143 Web Technology

1) Understand the principles of creating an effective web page, including an in-depth consideration of information architecture.

2) Learn the language of the web: HTML and CSS.
3) Learn techniques of responsive web design, layouts & style sheets.
4) Learn basics of Bootstrap frame work.

BSCHAI-144(i) Software Engineering

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

B.Voc(SD)

Course Outcomes

Semester I

BVSD-111 Fundamentals of Computer and Software Development

1) Understanding the fundamentals concept of hardware, software of Computers and how it works.
2) Understanding the concept of Operating system.
3) Identify, understand and apply different number systems and codes.
4) Understanding the basics of Software Development, Quality attributes and associated problems with software and software development.

BVSD-112 Programming using C

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

BVSD-113 Web designing using HTML

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

Semester II

BVSD-121 Object Oriented Programming using C++

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

BVSD-122 Data structure

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

Semester III

BVSD-211 Programming using Java

On successful completion of this course the students are:

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

BVSD-212 Fundamentals of DBMS

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

BVSD-213 Operating System

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

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

BVSD-214 Management Information System

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

BVSD-217 Workshop on Adobe Photoshop

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

Semester IV

BVSD-221 Web Development using PHP and MYSQL

After completion of the course the student should able to:

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

BVSD-222 Content Management System

After completion of the course the student should able to:

1) Understand what a Content Management System is and how it differs from traditional, flat websites
2) Select the appropriate server environment and be able to install Joomla's files and database
3) Successfully organize and present content in Joomla
4) Select and integrate extra Joomla features from various sources, understanding the difference between different types of extension.
5) Modify the appearance and layout of Joomla websites.
6) Understand how to protect and backup CMS websites.

BVSD-223 Computer Networks

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

1) Describe the general principles of data communication.
2) Describe how computer networks are organized with the concept of layered approach.
3) Implement a simple LAN with hubs, bridges and switches.

4) Describe how packets in the Internet are delivered.
5) Analyse the contents in a given data link layer packet, based on the layer concept.
6) Describe how routing protocols work.
7) To study various layers of OSI/TCP IP model.

BVSD-224 Relational database Management System

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

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

Semester V

BVSD-312 Management Information System

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

BVSD-313 Web Development using ASP.Net

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

BVSD-314 Software Testing Concepts and Tools

1) Have an ability to apply software testing knowledge and engineering methods.
2) Have an ability to design and conduct a software test process for a software testing project.
3) Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.
4) Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
5) Have an ability to use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects.

6) Have basic understanding and knowledge of contemporary issues in software testing, such as component-based software testing problems
7) Have an ability to use software testing methods and modern software testing tools for their testing projects.

Semester VI

Students acquires skills in 6-month Industrial Training

Diploma in Computer Hardware and Networking

Course outcomes

DCHN-1 Fundamentals of Information Technology and MS-Office

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

DCHN-2 Network Essentials

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

DCHN-4 PC Assembling and Troubleshooting

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

DCHN-5 Windows 2007 Server Administration

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

Add on Certificate Course in Web Designing

Course Outcomes

CC-101 Web Designing Using HTML & DHTML

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

CC-201 Web development using PHP

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

M.Sc(IT)

Course outcomes

Semester I

MS-111 Computer Fundamentals

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

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

MS-112 Computer Programming using C

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

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

MS-113 Computer Organization and Architecture

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

1) Understand the basics of computer hardware and how software interacts with computer ha rdware.
2) Analyze and evaluate computer performance.
3) Understand how computers represent and manipulate data.
4) Understand computer arithmetic and convert between different number systems.
5) Assemble a simple computer with hardware design including data format, instruction for mat, instruction set, addressing modes, bus structure, input/output, memory, Arithme tic/Logic unit, control unit, and data, instruction and address flow.
6) Use Boolean algebra as related to designing computer logic, through simple combinati onal and sequential logic circuits.

MS-115 Operating Systems

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

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

MS-117 E2 Quantitative Aptitude & Reasoning

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

Semester II

MS-121 Object Oriented Programming Using C++

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

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

MS-122 Data and File Structures

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

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

MS-123 Software Engineering

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

MS-124 RDBMS and Oracle

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

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

MS-127 E1 Workshop on Corel Draw

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

MS-127 E2 Workshop on Adobe Photoshop

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

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

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

Semester III

MS-211 Web Technology

Outcomes:

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

MS-212 Java Programming

Outcomes:

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

MS-213 Computer Networks

Outcomes:

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

MS-214 Modern Information Systems

Outcomes:

1) To describe the role of information technology and decision support systems in business and record the current issues with those of the firm to solve business problems.
2) To introduce the fundamental principles of computer-based information systems analysis and design and develop an understanding of the principles and techniques used.
3) To enable students understand the various knowledge representation methods and different expert system structures as strategic weapons to counter the threats to business and make business more competitive.
4) To enable the students to use information to assess the impact of the Internet and Internet technology on electronic commerce and electronic business and understand the specific threats and vulnerabilities of computer systems.
5) To provide the theoretical models used in database management systems to answer business questions.
6) To understand the basic principles and working of information technology.
7) Describe the role of information technology and information systems in business.
8) To give an overall perspective of the importance of application of internet technologies in business administration.

MS-217 CBC-III Workshop on Python Programming

Outcomes:

1) Install and run the Python interpreter
2) Create and execute Python programs
3) Understand the concepts of List and functions.
4) To acquire programming skills in core Python.

5) To acquire Object Oriented Skills in Python
6) To understand the various String and formatting methods.
7) To provide knowledge and experiences to students that serve as a foundation for continued learning of presented areas.

Semester IV

MS-221 Computer Graphics

Outcomes:

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

MS-222 Linux Administration

Outcomes:

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

MS-223 Research Methodology

Outcomes:

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

MS-224 Artificial Intelligence

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

M.Sc(AI &DS)

Course outcomes

Semester I

MSAIDS-111 Introduction to Artificial Intelligence

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

MSAIDS-112 Python Programming

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

MSAIDS-113 Data Structure & Algorithms

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

Semester II

MSAIDS-121 Introduction to Data Science

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

MSAIDS-122 Web Analytics

1) Able to learn basics of Web Analytics.
2) Understand the concepts of qualitative analysis.
3) Able to know about web/social/mobile analytics platforms.
4) Understand how to analyze basic Audience, Acquisition, and Behavior reports.

MSAIDS-122 Machine learning with R

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

MSAIDS-125 E1 Data Warehousing & Mining

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

PGDCA (Post Graduate Diploma in Computer Application)

Course Outcomes

Semester I

PGDCA-101 Fundamentals of Information Technology

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

PGDCA-102 Operating Systems

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

PGDCA-103 Problem Solving Using C

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

PGDCA-106 E1 Computer Oriented Statistical Methods

To make the students learn about the basics of Statistics such Central Tendency, Correlation, Regression, Concepts of Sampling and Sampling Distribution.

PGDCA-106 E2 Quantitative Aptitude & Reasoning

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

Semester II

PGDCA-201 Database Management System

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

PGDCA-202 Introduction to Computer Networks & E-Commerce

1) To provide students with an overview of the concepts and fundamentals of data communication and computer networks
2) To familiarize with the basic taxonomy and terminology of computer networking area

3) To provide adequate knowledge and understanding about Internet, Web browsers, search engines
4) To give an introduction of E-commerce Technology, Business models and Electronic payment System.

PGDCA-203 Object Oriented Programming Using C++

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

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

PGDCA-206 E1 Workshop on Corel Draw

This course will help the students to learn how to work in Corel Draw and to use its different tools such as Text, Lines, Shapes, Objects, Colors, Bitmaps and Tables.

PGDCA-206 E2 Workshop on Adobe Photoshop

This course will give students an introduction to Adobe Photoshop and its different tools such as Selections, Layers, Channels and Filters.

PG Department of Commerce and Management
B.Com (Honours)

Course Outcomes:

Semester I

BC/ BBA 1.1 Environmental and Road Safety Awareness

Creating awareness regarding Environmental and Road Safety issues.

BCH 1.2 Financial Accounting

Developing basic skills to maintain Accounts

BCH 1.3 Business Laws

To provide knowledge of Contract Act to students

BCH 1.4 Micro Economics

Basics of Micro level Economics , Concepts, Theories and Applications in business

BCH 1.5/ 1.5 A Punjabi/ Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence

Semester-II

BCH 2.1 Business Communication Skills

To develop effective communication skills and methods of preparing various types of Business correspondence

BCH 2.2 Corporate Law

To impart knowledge of Company regulations.

BCH 2.3 Management Principles and Applications

To understand basic Management Concepts and principles for better understanding.

BCH 2.4 Macro Economics

Introducing with various issues of Macro level economics, Theories and important functions of Consumption, Investment

BCH 2.5/ 2.5 A Punjabi/ Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence

Semester-III

BCH 3.1 Human Resource Management

Developing Knowledge of different aspects of Human Resource and its Management

BCH 3.2 Income Tax Law and Practice

Basic knowledge of Residential Status, Different Heads of Income Deductions and Computation of Tax

BCH 3.3 Corporate Accounting

Develop the skill of Preparation of Accounts of Various Companies and getting job opportunities in corporate world

BCH 3.4 Business Statistics

To make aware of statistical tools for analysis of quantitative data

BCH 3.5 E-Commerce

Understanding of Electronic usage in Business activities

BCH 3.6 Seminar

To enhance the educational and communication skills of students.

Semester-IV

BCH 4.1 Cost Accounting

To acquaint the students with basic concepts used in cost Accounting, Various methods involved in cost ascertainment.

BCH 4.2 Business Mathematics

To develop practical knowledge of mathematical techniques used in Business analysis by Matrix, Interest valuation, Linear programming, Transportation and Assignment Problems techniques

BCH 4.3 Computer Applications in Business

Skill development in using various computer tools for Business purpose like Word processing, Spreadsheet, Methods of presentation preparation

BCH 4.4 Indian Economy

Awareness of various issues of Indian Economy like its' sectors, stages, trends, changes, Policy implications and role in global scenario

BCH 4.5 Entrepreneurship

To make students aware about different aspects of entrepreneurship qualities, factors, starting , documentation and various issues regarding entrepreneurship development.

Semester-V

BCH 501 Management Accounting-I

Imparting Knowledge of Management Accounting Tools like Financial Statement Analysis, Ratio analysis

BCH 502 Cost Accounting-I

To provide knowledge regarding Cost Analysis and its implication on Business Controlling

BCH 503 Indirect Taxes

Understanding of GST, Input Tax Credit Authorities, Penalties and Appeals under GST

BCH 504 Fundamentals of Entrepreneurship

To familiarize with different Investment alternatives, framework and role of Investor protection

BCH 505 E-Commerce

To familiarize with mechanism for conducting business transactions through electronic means

BCH 508 Money and Banking

To provide the knowledge regarding the banking scenario operative in the country and money markets too.

Semester-VI

BCH 601 Management Accounting-II

Imparting Knowledge of Management Accounting Tools like Financial Statement Analysis, Ratio analysis.

BCH 602 Cost Accounting-II

To provide knowledge regarding Cost Analysis and its implication on Business Controlling.

BCH 603 Financial Management

To familiarize the students with principles and practices of Financial Management.

BCH 604 Corporate Management

To make the students aware about the management of the company form of organization

BCH 605 Productions and Operations Management

To provide the knowledge regarding the management of the operations and production techniques.

BCH 608 Financial Institutions and Markets

Imparting knowledge regarding the Financial institutions, markets and instruments.

Bachelor of Commerce (B.Com)

Semester I

BC/BBA1.1 Environmental and Road Safety Awareness

Creating awareness regarding Environmental and Road Safety issues

BC 1.2 Financial Accounting

Developing basic skills to maintain Accounts

BC 1.3 Business organisation and Management

To provide Basic knowledge about organization and management of business enterprises

BC 1.4 English

To develop various skills of Business Communication (Business letters, Report Writing and Basic Vocabulary

BC 1.5A/1.5B Punjabi Compulsory/ Mudhla Gyan

Basic knowledge of Regional Language and its use in Business Advertisement and Correspondence

Semester II

BC 2.1 Ethical practices in Business

To develop various Ethical practices in Business

BC 2.2 Business law

Creating awareness about various Business Laws (Mainly Indian Contract Act , Sale of Goods Act, Partnership Act and Negotiable Instruments Act)

BC 2.3 Business Mathematics and Statistics

Introduction with various tools used for a Statistical Analysis

BC 2.4 English

To develop various skills of Business Communication (Business letters, Report Writing and Basic Vocabulary

BC 2.5A/ 2.5 B Punjabi Compulsory/ Mudhla Gyan

Basic knowledge of Regional Language and its use in Business Advertisement and Correspondence

Semester III

BC 3.1 Company Law

Making clarity of Company rules and regulations

BC 3.2 Income Tax law and Practice

Creating knowledge of basics of Income Tax their Heads and computation of Tax

BC 3.3A/ 3.3 B Punjabi Compulsory/ Mudhla Gyan

Basic knowledge of Regional Language and its use in Business Advertisement and Correspondence

BC 3.4Computer Applications in Business

Enhancement of skills needed for Computerized Accounting System

BC 305/305APunjabi / Basic Punjabi

To give knowledge of Regional language through Text book and developing skill of Paragraph writing

Semester IV

BC 4.1 Corporate Accounting

Developing skills to prepare Company Accounts

BC 4.2 Cost Accounting

To acquaint the students with basic concepts used in cost Accounting, Various methods involved in cost ascertainment

BC 4.3A/4.3BPunjabi Compulsory / Mudhla Gyan

To give knowledge of Regional language through Text book and developing skill of Paragraph writing

BC 4.4 E- Commerce

To familiarize with mechanism for conducting business transactions through electronic means

Semester V

BC 5.1 Human Resource Management

To Acquaint students with the techniques and principles to manage human resource of an organization

BC 5.1 Principles of Marketing

To provide basic knowledge of Concepts, Principles, tools and Techniques of Marketing

BC 5.2 Fundamentals of Financial Management

To familiarize the students with principles and practices of Financial Management

BC 5.3 Entrepreneurship

To familiarize with different Investment alternatives, framework and role of Investor protection

BC 5.4 Principles of Micro Economics

To culminate basic concepts / Principles of Micro economic Theory

BC 5.5A/5.5B3BPunjabi Compulsory / Mudhla Gyan

To give knowledge of Regional language through Text book and developing skill of Paragraph writing

Semester VI

BC 6.1 Corporate Tax Planning

To provide Basic knowledge of Corporate Tax planning and its impact on decision making

BC 6.1 Banking and insurance

To impart knowledge about the basic principles of the banking and insurance

BC 6.1 International Business

To give knowledge of Concepts, Importance and dynamics of International Business and India's role and involvement in global business

BC 6.2 Office Management and Secretarial Practices

To create awareness regarding Activities in Modern Office, Facilities and Working Environment for smooth official Working

BC 6.2 Fundamentals of Investment

To familiarize with different Investment alternatives , valuation to understand role of Investor Protection.

BC 6.2 Consumer Protection

To understand Rights of Consumer, and legal framework of Protection of Consumer Rights

BC 6.3 Personal Selling and Salesmanship

Practical skill development to understand fundamentals of Personal Selling and Selling Process

BC 6.4 Indian Economy

To enable in understanding major economic problems in India and their solutions along with knowledge of modern tools of Macroeconomic analysis and policy framework

BC 6.5A/6.5B Punjabi Compulsory / Mudhla Gyan

To give knowledge of Regional language through Text book and developing skill of Paragraph writing

BBA

Course Outcomes

Semester I

BC /BBA 1.1 Environmental and Road safety Awareness

Creating awareness regarding Environmental and Road Safety issues

BBA 1.2 Principles of Business Management

To provide Basic knowledge about organization and management of business enterprises.

BBA 1.3 Foundations of Accounting

Developing basic skills to maintain Accounts.

BBA 1.4 Communication Skills in English-I

To develop various skills of Business Communication.

BBA-101A Punjabi Compulsory/101B Mudla Gyan (Elementary Punjabi)

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence.

Semester II

BBA 2.1 Management based Workshop on Soft Skills

The objective is to develop both oral and written communication skills relating to organizational and Business issues.

BBA 2.2 Managerial Economics

It aims to acquaint students with economy as a whole including measurement of national income, inflation and unemployment.

BBA 2.3 Business Statistics

To make aware of statistical tools for analysis of quantitative data.

BBA-2.4 Ethics and Corporate Social Responsibility

Concept building of Corporate governance and Business ethics to be applied in practical .

BBA -101A Punjabi Compulsory/ 101B Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence.

CAE1.2 Drug Abuse Problem Management and Prevention

To develop knowledge in students about Drug Abuse Problem Management and Prevention.

Semester III

BBA-3.1 Organisational Behaviour

It imbibes the students regarding individual and group behaviour in any organization.

BBA-3.2 Principles of Marketing Management

To understand the students about the basic Principles of Marketing Management.

BBA-3.3 Production and Operations Management

Developing knowledge about various steps of product, design, development, Plant location, Storage, Production Planning and control.

BBA- 3.4 Business Research Methodology

Understanding of the Research process, tools and techniques in order to facilitate managerial decision making.

BBA-3.5 Seminar on Entrepreneurship

To familiarize with different Investment alternatives, framework and role of Investor protection

BBA-301A Punjabi Compulsory/301B Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence.

Semester IV

BBA-4.1 Human Resource Management

To understand the students with the techniques and principles to manage human resource of an organization.

BBA- 4.2 Financial Management

To develop a conceptual clarity and basic understanding of the fundamentals of corporate finance.

BBA-4.3 Organization Development and Change

To exploration of the field of OD through its human and social process.

BBA- 4.4 E-Commerce

To familiarize the student with the basic concept of e-commerce and to provide them the knowledge of planning, scheduling and controlling a successful e- business.

BBA-4.5 Business Environment

The main objective is to develop knowledge base for Environment factors affecting Business.

BBA-401A Punjabi Compulsory/ 401 B Mudla Gyan

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence.

Semester V

BBA-501 Communication Skills in Punjabi /BBA 501 A Elementary Punjabi

To develop basic skill of Regional language through Literature, grammar to use it in official correspondence.

BBA-501 Business Research Methods

To enhance the knowledge about research methods and Techniques.

BBA-502 Workshop on Time and Workload Management

To enhance the knowledge about time and work management.

BBA -503 Seminar on Summer Training

The purpose of practical training to expose the students to real work of environment experience and gain the knowledge through hands on observation and job execution.

Choose any **Three** Subjects from not more than Two Functional Areas

Marketing Management

BBA-505 Rural Marketing

To develop the conceptual clarity of area in rural Marketing.

BBA-506 Brand and Product Management

It imbibes the students regarding brand knowledge and managing the product.

Human Resource Management

BBA-508 Management of Industrial Relations

To understand the key participants, institutions, relationships and processes in employment relations.

Semester VI

BBA-601 Industrial Training Project

To making students aware regarding work on live projects which equip them with the required skill needed for the corporate world.

BBA-602 Project Report

The report will be prepared by the student under the guidance of respective project guide

BBA-603 Seminar on the Project Report.

To motivate the students in expressing their ideas in front of group and creating confidence ability.

BBA-5.4 Viva-Voce

To make technically strong in facing Curriculum based query.

B.Voc. Hospitality and Toursim

Semester I

PBVOC- 101A / B Punjabi

To create knowledge about the Vernacular language and to identify the local needs of the society. It is also a state obligation to study the Punjabi language in undergraduate courses.

BVHT 107 English (Communication Skills)

To enhance the communication skills in students to make them employable, it also helpful to increase customer handling skills.

BVHT 101 Workshop on Customer query and Complaint Management

To provide basic knowledge of Customer Query and Complaint Management, Problem Solving: methods and techniques, positive attitude, empowerment and Query Handling: Cashiering Activities and Night Auditing Procedure, Receiving payment method details from the guests, Prepare bills as per different categories of guests and Various modes of bill settlement. To aware about Safe Health and Hygiene in Hotels especially on cleanliness and Safe health practices.

BVHT 102 Introduction to Tourism, Aviation & Hospitality Industry

To provide basic knowledge of Tourism, Aviation and Hospitality Industry. To aware about the functions of travel agency, Air Transportation, Airport policies and rule. Type of hotels and its working.

BVHT 103 Front Desk Operation – I

To provide basic knowledge of Front Office Organization & Hierarchy. Provide awareness about the guest check-in and checkout process, Customer- Centric Service, Customer service and Handling customer requests.

BVHT-104 Housekeeping Operation I

To provide basic awareness of Housekeeping in Hospitality Operation, Role of Housekeeping in Guest Satisfaction and Repeat Business, Organization Chart of The Housekeeping department.

BVHT 105 Seminar on Basics of Hospitality Service

To provide basic knowledge of Front Communication with Customers and Colleagues, Handling customer complaints/ feedback- Build friendly but impersonal relationship with the customers'. To aware about the Service Quality Standards, Achieving customer satisfaction, Gender and Age Sensitivity Maintaining IPR and educating customers on specific facilities and services available.

BC- 101 Environmental and Road Safety Awareness

To Provide the awareness about the issues related to environment and Road Safty

Semester II

BVHT-201 Workshop on Geography of Tourism

To provide basic knowledge on Geography of Tourism and Importance of Geography in Tourism. Also provide practical aspect of Location of important tourist cities, national parks, wildlife sanctuaries; cultural, historical and religious tourist spots in India.

BVHT 202 Tourism Products of India

To provide basic knowledge of different tourism products in India. Aware about the Tourism products and also role of Heritage management organizations like UNESCO, ASI, ICOMOS, INTACH.

BVHT-203 FRONT OFFICE OPERATIONS II

To provide basic skills of Welcoming and greeting the guests, understanding reservation s tatus, preparing for guest arrivals at Reservation and Front Office, Pre-registration and Registration

BVHT- 204 HOUSEKEEPING OPERATIONS II

To describe the functions of Room Layout And Guest Supplies -Standard rooms, VIP ROOMS, Guest's special requests Area Cleaning -Guest rooms , Front-of-the-house Areas, Back-of-the house Areas , Work routine and associated problems.

BVHT-205 Seminar on Hospitality Supervisory Skills

To provide basic knowledge of Hospitality and Tourism Management, Problem Solving: methods and techniques, positive attitude, empowerment and Query Handling.

BVHT- 206 On Job Practical Training & Report (Front Office Executive)

To provide basic awareness of front office operations and Role of FD managers in Housekeeping in Guest Satisfaction.

Semester III

BVHT 301 Management Principles and Practices

Build an understanding of theoretical framework of principles of management. The course aims to provide basic knowledge to the students about the organisation and management of a business enterprise.

BVHT 302: HUMAN RESOURCES MANAGEMENT

To give a conceptual understanding of human resource practices in business organizations. Performance appraisal and career planning techniques.

BVHT 303: WORKSHOP ON CUSTOMER RELATIONSHIP MANAGEMENT

To give an Overview and concept of Customer Relationship Management (CRM) practices in business organizations and strategy Management support System and Management Information System.

BVHT 304: FRONT OFFICE OPERATIONS-III

To familiarize with the front office operation. Aware about the Introduction Duties and responsibilities Front Office Department and Key control and key handling procedures.

BVHT 305: HOUSEKEEPING OPERATION III

To provide basic knowledge of Role of Housekeeping in Guest Satisfaction and Repeat Business, Customer- Centric Service, Customer service and Handling customer requests. Identifying Housekeeping Responsibilities and Personality Traits of housekeeping Management

BVHT 306: SEMINAR ON HOTEL AND RESORT MANAGEMENT

To provide basic knowledge of Role of Housekeeping in Guest Satisfaction and Repeat Business, Customer- Centric Service, Customer service and Handling customer requests. Identifying Housekeeping Responsibilities and Personality Traits of housekeeping Management

BVHT 307: ON JOB PRACTICAL TRAINING AND REPORT

To aware the practical aspects of hospitality and tourism sector, provide basic knowledge of Role of Housekeeping in Guest Satisfaction and familiarize with the front office operation

Semester IV

BVHT 401: Personality Development

To enhance holistic development of students and improve their employability skills. To develop communication and problem-solving skills. To re-engineer attitude and understand its influence on behavior.

BVHT 402: BASIC OF COMPUTER APPLICATION

The basic objective of the course is to introduce the students to the world of computers and computer technology. To introduce the students to the basic concepts of operating systems, World Processing, Database, presentations and Networking.

BVHT 403 Basic of French

To give knowledge about the French Language. To understand the problems of international tourists.

BVHT 404 Tourism Management

The module aims to provide the basic of Tourism upon which the entire hospitality Industry is based. Help to aware about the recent trends in tourism sector.

BVHT 405 Front Desk Operation IV

To provide basic knowledge of Front Office Organization and Hierarchy. Provide awareness about the guest check-in and checkout process, Customer- Centric Service, Customer service and Handling customer requests

BVHT 406 House Keeping Operations IV

To provide basic knowledge of Role of Housekeeping in Guest Satisfaction and Repeat Business, Customer- Centric Service, Customer service and Handling customer requests. Identifying Housekeeping Responsibilities and Personality Traits of housekeeping Management.

BVHT 407 Seminar Indian Societies and Culture

The Indian society and culture is the main tourist product of India. Its thorough knowledge is essential for any tourism professional to showcase this element for the satisfaction of the tourists visiting various parts of India. This course will brief learner about the core understanding of Indian society, culture and various religions in India.

BVHT 408 On the Job Tarining and Report

To provide basic knowledge of Front Office Organization and Hierarchy. Provide awareness about the guest check-in and checkout process, Customer- Centric Service, Customer service and Handling customer requests.

Semester V

BVHT 501: Travel Agency And Tour Operation Management

To understanding the roles of travel agents and tour operators. Aware the students about the efficient working of travel agency and tour operation business.

BVHT 502: HOUSEKEEPING OPERATION –V

To familiarise with the house keeping operations, Layout of House Keeping Department, Hotel Guest Rooms and Work routine for floor supervisors and chamber maids.

BVHT 503: FRONT OFFICE OPERATIONS-V

To aware the recent standards in front desk operation, Plan and Control day to day Front Office Activities and Manage the Front Office Staffing Process.

BVHT 504: Seminar On Organisational Behaviour In Hospitality Industry

To handling the team working process and to manage the human behavioural aspects like perception and leadership. To aware the role of group dynamics and motivation among the students.

BVHT 505: Advertising And Personal Selling In Hospitality Services

To give conceptual understanding of advertising and personal selling practices in hospitality business organizations. Proper use and implementation of planning techniques for increase organisational profits.

BVHT 506: Ethical, Legal And Regulatory Framework of Tourism

To aware tourism Planning Process including development and Ethical, Legal and Regulatory Framework of Tourism industry.

BVHT 507: WORKSHOP ON HOTEL ACCOUNTING SYSTEM

The objective of this paper is to help students to acquire conceptual knowledge about accounting process used in front office.

Semester VI

The Sixth Semester will include industrial training that provide practical training and exposure, application of theoretical concepts in real life, it also enhance the employment skills. It tries to increase the communication and leadership skills. It provides first-hand experience of job environment.

B.Voc. Retail Management

Semester I

PBVOC- 101A / B Punjabi

To create knowledge about the Vernacular language and to identify the local needs of the society. It is also a state obligation to study the Punjabi language in undergraduate courses.

BVHT 107 English (Communication Skills)

To enhance the communication skills in students to make them employable, it also helpful to increase customer handling skills.

BVRM 101: INTRODUCTION TO RETAIL MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of retail management..

BVRM 102: MANAGEMENT PRINCIPLES AND PRACTICES

This paper is aimed at providing students with a comprehensive understanding of Principles of management.

BVRM 103: WORKSHOP ON VISUAL MERCHANDISING

This paper is aimed at providing students with a comprehensive understanding of Visual Merchandising.

BVRM 104: SEMINAR ON RETAIL SALESMANSHIP

This paper is aimed at providing students with a comprehensive understanding of Retail Salesmanship.

BVRM 105: FUNDAMENTAL OF COMPUTER APPLICATIONS

This paper is aimed at providing students with a comprehensive understanding of fundamental of computer applications and software's.

BC- 101 Environmental and Road Safety Awareness

To Provide the awareness about the issues related to environment and Road Safety.

Semester II

BVRM 201: Store Display And Visual Merchandising

This paper is aimed at providing students with a comprehensive understanding of Principles of store display and visual merchandising.

BVRM 202: ORGANISATION AND TEAM DYNAMICS

This paper is aimed at providing students with a comprehensive understanding of organisational working, team work, group culture, motivation and leadership qualities.

BVRM 203: Workshop On Store Cleanliness And Hygiene

This paper is aimed at providing students with a comprehensive understanding of Store Cleanliness and Hygiene.

BVRM 204: Seminar On Customer Relationship Management

This paper is aimed at providing students with a comprehensive understanding of Customer Relationship Management.

BVRM 205: E-COMMERCE

This paper is aimed at providing students with a comprehensive understanding of E-Commerce and Electronic trading.

Semester III

BVRM 301: FINANCIAL MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of financial management.

BVRM 302:ADVERTISING & SALES MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of Advertising and Sales Management.

BVRM 303: RETAIL STORES AND OPERATION MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of retail stores and operation management.

BVRM 304: HEALTH & SAFETY MANAGEMENT ISSUES IN RETAIL

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of health & safety management issues in retail.

BVRM 305: WORKSHOP ON MARKETING MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of Marketing Management.

BVRM 306: SEMINAR ON COMMUNICATION SKILLS

This paper is aimed at providing students with a comprehensive communication skill also in regional language.

Semester IV

BVHT 401: Personality Development

To enhance holistic development of students and improve their employability skills. To develop communication and problem-solving skills. To re-engineer attitude and understand its influence on behavior.

BVRM 402: PROJECT MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of Project Management.

BVRM 403: LEADERSHIP AND TEAM MANAGEMENT

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of leadership and team management.

BVRM 404: E-RETAILING

This paper is aimed at providing students with a comprehensive understanding of the theoretical and applied aspects of E – Retailing

BVRM 405: Workshop On Developing A Franchise System

This paper is aimed at providing students with a comprehensive understanding of Workshop on Developing a Franchise System.

BVRM 406: SEMINAR ON ENTREPRENEURSHIP SKILLS

This paper is aimed at providing students with a Entrepreneurship skills.

Semester V

BVRM- 501: MARKETING MANAGEMENT

The objective of the paper is to provide knowledge to students about marketing concepts, philosophies, processes and techniques in order to manage the overall marketing operations of the retail organisation.

BVRM- 502: BUSINESS ETHICS AND CSR

The objective of this paper is to familiarise the students with the importance of ethics in business and understanding of issues related to corporate social responsibility

BVRM- 503: RETAIL PLANNING AND LEGAL FRAMEWORK

The objective of the paper is aware the students about retail planning process including registration process, legal and regulatory framework of retail industry.

BVRM- 504: TOTAL QUALITY MANAGEMENT

The objective of the paper is to provide knowledge to students of the concepts of total quality management and to inculcate among them a concern for quality and customer satisfaction.

BVRM 505: WORKSHOP ON VISUAL MERCHANDISING AND CUSTOMER SATISFACTION

The basic objective of the course is to encourage students to understand about merchandising strategies required for retail market as well as the importance of colour theories for promotional displays. Focuses on consumer behaviour and how one can maximize profitability through visual display by creating a unique buying experience for the customers.

BVRM 506: SEMINAR ON RETAIL STORE TEAM MANAGEMENT

The basic objective is to provide knowledge to the students about building and managing retail store teams.

Semester VI

The Sixth Semester will include industrial training that provide practical training and exposure, application of theoretical concepts in real life, it also enhance the employment skills. It tries to increase the communication and leadership skills. It provides first-hand experience of job environment.

Bachelor of Commerce (Accounting and Finance) B.Com (A & F)

Course outcomes

Semester I

BC/BBA - 1.1 Environmental and Road Safety Awareness

Creating awareness regarding Environmental and Road Safety issues

BCAF -1.2 Financial Accounting

To equip with skill of recording Financial Transaction

BCAF -1.3 Business Law

Creating awareness about various Business Laws (Mainly Indian Contract Act, Sale of Goods Act, Partnership Act and Negotiable Instruments Act)

BCAF -1.4 Communication Skills in English

To develop usage of Language and making English Language as a communication tool

BCP 101A/101B Punjabi Compulsory / Punjabi Compulsory(MudlaGyan/Elementary Punjabi)

To make efficient in regional language to do Business correspondence in better way

Semester II

BCAF-2.1 Corporate Accounting

To develop practical skills to maintain various Company Accounts

BCAF-2.2 Business organisation and Management

To provide Basic knowledge about organization and management of business enterprises

BCAF-2.3 Corporate Laws

To enhance knowledge of Company regulations

BCAF-2.4 Communication Skills in English

To develop usage of Language and making English Language as a communication tool

BCP 201A/201B Punjabi Compulsory / Punjabi Compulsory(MudlaGyan/Elementary Punjabi)

To make efficient in regional language to do Business correspondence in better way

CAE-1.2 Drug Abuse: Problem, Management and Prevention

To help the students to understand the cause of drug abuse and to prevent it.

Semester III

BCAF-3.1 Financial Management

Providing Concept knowledge of financial Analysis in management through various tools

BCAF- 3.2 Cost Accounting

To provide knowledge regarding Cost Analysis and its implication on Business Controlling

BCAF- 3.3 Income Tax Laws and Practice

Basic knowledge of Residential Status, Different Heads of Income Deductions and Computation of Tax

BCAF 3.4 Fundamentals of Computer Applications

Enhancement of skills needed for Computerized Accounting System

BCAF 3.5 Workshop on Personality development and Soft Skills

To develop usage of Language and making English Language as a communication tool

BCAF 3.6 Seminar (Based on Summer Training)

Development of practical skill and Imparting Knowledge of Accounting Tools

Semester IV

BCAF 4.1 Management Accounting

Imparting Knowledge of Management Accounting Tools like Financial Statement Analysis, Ratio analysis

BCAF 4. 2 Indirect Tax Laws

Understanding of GST, Input Tax Credit Authorities, Penalties and Appeals under GST

BCAF 4.3 Fundamentals of Statistics

Introduction with various tools used for a Statistical Analysis

BCAF 4.4 Workshop on Contemporary Business Issues

To develop current knowledge of commerce related issues

BCAF 4.5 Seminar on Business Ethics & values

Value inculcation in students of commerce to understand their responsibility toward society and develop Ethics in their Applications

Semester V

BAF 501 Cost Accounting

To provide knowledge regarding Cost Analysis and its implication on Business Controlling

BAF 502 Corporate Tax Planning

To provide knowledge regarding Tax Management, Planning

BAF 503 Financial Services

To give knowledge of Financial Services

BAF 504 ResearchMethodology& Statistical Techniques

To provide knowledge of Research & Statistical Techniques

BAF 505 Project Planning and Control

Imparting understanding of Project planning , Formulation environment along with Cost Management techniques

Semester VI

BAF 601 Strategic Cost Accounting

Concept clearance of Strategic Cost Accounting

BAF 602 Security Analysis and Portfolio Management

To give knowledge of Investment and Portfolio Management with concept clearance and theoretical knowledge

BAF 603 Corporate Finanacial Accounting

To equip with concepts of Corporate Finanacial Accounting

BAF 604 Contemporary Auditing

Concept clearance of IFRS, AS, Accounting Thoughts, Corporate Reporting, Price level Accounting, HRA, Social Accounting.

BAF 605 Company Law

To enhance knowledge of Company regulations

Master of Commerce

Course outcomes

Semester I

MC 101 Management Concepts & Organsational Behavior

The objective of this paper is to familiarize the students with the management concepts and techniques in business organizations.

MC 102 Accounting for Managerial Decisions

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

MC 103 Business Economics

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

MC 104 E- Commerce

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

MC 105 (i) Financial Management

The main aim of this paper is to equip participants with requisite financial skills required for the solution of managerial problems.

MC 105 (ii) International Accounting

The main objective of this paper is to provide important information that can be used to make informed decisions.

Semester II

MC 201 Advanced Accounting

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

MC 202 Business Environment

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

MC 203 Research Methodology & Statistical Techniques

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

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

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

MC 205(i) Financial Institutions and Markets

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

MC 205 (ii) Management Information and Control System

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

Semester III

MC 301 Contemporary Auditing

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

MC 302 Corporate Legal Framework

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

MC 303 Direct Tax Laws

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

MC 304 Marketing Management

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

MC 305 Workshop on Data Analytics

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

MC 306 (i) Management of Financial Services

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

MC 306 (ii) Project Management

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

Semester IV

MC 401 Human Resource Management

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

MC 402 Fundamentals of Investment

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

MC 403 Banking and Insurance Services

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

MC 404 Corporate Tax Planning

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

MC 405 Project Report

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

MC 406 (i) International Finance

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

MC 406 (ii) Corporate Governance

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

Department of Mathematics
B.A.(GENERAL) MATHEMATICS

Course outcomes

Semester I & II

Calculus (Differential and Integral) :

1) The course will augment the earlier knowledge of calculus.
2) The students will learn new concepts of differential calculus and integral calculus.
3) Students will be able to generate solutions to unfamiliar problems.

Ordinary and Partial Differential Equations :

1) Course will introduce the concept of ordinary and Partial Differential Equations to the students.

2) The students will be able to learn applications of Differential equations to solve various practical problems.

Algebra and Trigonometry :

1) The course will augment the earlier knowledge of Algebra.
2) The students will learn new methods of solving algebraic equations and will learn about new properties of Matrices.

Analytic Geometry :

1) Course will introduce the concept of Analytic Geometry to the students.
2) The students will be able to learn the properties of various geometric curves in two dimensional and three dimensional.

Semester III & IV

Analysis:

This course will enable the students to

1) Familiar with the concept of sequences, series and recognize convergent, divergent, bounded, Cauchy and monotone sequences.
2) Test the convergence and divergence of series using various tests.
3) Understand and apply the basics of Riemann integration.
4) Understand the concept of pointwise and uniform convergence, term by term integrations and differentiation.

Advanced Calculus :

This course will enable the students to:

1) Sketch curves in a plane using its mathematical propertiesin the different coordinate systems of reference.
2) Compute area of surfaces of revolution and the volume of solids by integrating over cross sectional areas.
3) Be well versed with conics and quadric surfaces so that they should able to relate the shape of real life objects with the curves/conics.

Numerical Methods and Vector Calculus :

The objectives of the course are to make the students,

1) To develop the mathematical skills of the students in the areas of numerical methods.
2) To teach theory and applications of numerical methods in a large number of engineering subjects which require solutions of linear systems, finding eigen values, eigenvectors, interpolation and applications, solving ODEs, PDEs and dealing with statistical problems like testing of hypotheses.

3) Student will have knowledge of central concepts of space curves; directional derivative; gradient; line and surface integrals; vector fields; divergence, curl and flux; the theorems of Green and Stokes, and the divergence theorem.

Statics and Dynamics :

This course will enable the students to:

1) Familiarize with subject matter, which has been the single centre, to which were drawn mathematicians, physicists, astronomers, and engineers together.
2) necessary conditions for the equilibrium of particles acted upon by various forces and learn the principle of virtual work for a system of coplanar forces acting on a rigid body.

Semester V & VI

Algebra-I:

Upon Successful completion of course students will

1) Have knowledge and skills to explain fundamental concepts of algebra such as groups, their properties and their role in modern mathematics.
2) Decide whether a given group is cyclic and given a finite cyclic group
3) Have knowledge and skills to explain fundamental concepts of algebra such as rings, their properties and their role in modern mathematics.
4) Express ideals, their algebra, principal ideals, Homomorphism theorems and also determine when the rings become a Euclidean rings, division rings.

Mathematical Methods : The main outcomes of the course are

1) The students will be able to learn Laplace transforms, Fourier series and Fourier transforms.
2) The students will be able to comprehend the techniques in solving various ordinary and partial differential equations.

Algebra-II :

The student will be familiar with basic knowledge of Vector spaces, subspaces, basis and dimensions Linear transformation, Isomorphism theorems, Diagonalization Eigen vectors and linear operators.

Discrete Mathematics :

The student will learn about the basic concept of discrete mathematics. The student will be able to solve difference equations with Recurrence relations and generating functions. The student will have sound knowledge of graph theory .

Number Theory :

The course will enable the students to :

1) Learn about some important results in theory of numbers including divisibility, Fundamental theorem of Arithmetic and congruence's.
2) Familiarize with prime number theorem, Chinese remainder theorem, Wilson Theorem
3) Learn about Arithmetic functions, Mobius inversion formula, Greatest integer function
4) Know about Primitive roots and indices, residues, Diophantine equations
5) Solved related problems

B.Sc(Non-Medical) Mathematics

Course outcomes:

Semester I & II

Calculus (Differential and Integral)

1) The course will augment the earlier knowledge of calculus.
2) The students will learn new concepts of differential calculus and integral calculus.
3) Students will be able to generate solutions to unfamiliar problems.

Ordinary and Partial Differential Equations

1) Course will introduce the concept of ordinary and Partial Differential Equations to the students.
2) The students will be able to learn applications of Differential equations to solve various practical problems.

Algebra and Trigonometry

1) The course will augment the earlier knowledge of Algebra.
2) The students will learn new methods of solving algebraic equations and will learn about new properties of Matrices.

Analytic Geometry

1) Course will introduce the concept of Analytic Geometry to the students.
2) The students will be able to learn the properties of various geometric curves in two dimensional and three dimensional.

Semester III & IV

Analysis

This course will enable the students to

1) Familiar with the concept of sequences, series and recognize convergent, divergent, bounded, Cauchy and monotone sequences.
2) Test the convergence and divergence of series using various tests.
3) Understand and apply the basics of Riemann integration.
4) Understand the concept of pointwise and uniform convergence, term by term integrations and differentiation.

Advanced Calculus

This course will enable the students to:

1) Sketch curves in a plane using its mathematical propertiesin the different coordinate systems of reference.
2) Compute area of surfaces of revolution and the volume of solids by integrating over cross sectional areas.
3) Be well versed with conics and quadric surfaces so that they should able to relate the shape of real life objects with the curves/conics.

Numerical Methods and Vector Calculus

The objectives of the course are to make the students,

1) To develop the mathematical skills of the students in the areas of numerical methods.
2) To teach theory and applications of numerical methods in a large number of engineering subjects which require solutions of linear systems, finding eigen values, eigenvectors, interpolation and applications, solving ODEs, PDEs and dealing with statistical problems like testing of hypotheses.
3) Student will have knowledge of central concepts of space curves; directional derivative; gradient; line and surface integrals; vector fields; divergence, curl and flux; the theorems of Green and Stokes, and the divergence theorem.

Statics and Dynamics

This course will enable the students to:

1) Familiarize with subject matter, which has been the single centre, to which were drawn mathematicians, physicists, astronomers, and engineers together.
2) necessary conditions for the equilibrium of particles acted upon by various forces and learn the principle of virtual work for a system of coplanar forces acting on a rigid body.

Semester V & VI

Algebra-I

Upon Successful completion of course students will

1) Have knowledge and skills to explain fundamental concepts of algebra such as groups, their properties and their role in modern mathematics.
2) Decide whether a given group is cyclic and given a finite cyclic group
3) Have knowledge and skills to explain fundamental concepts of algebra such as rings, their properties and their role in modern mathematics.
4) Express ideals, their algebra, principal ideals, Homomorphism theorems and also determine when the rings become a Euclidean rings, division rings.

Mathematical Methods

The main outcomes of the course are

1) The students will be able to learn Laplace transforms, Fourier series and Fourier transforms.
2) The students will be able to comprehend the techniques in solving various ordinary and partial differential equations.

Algebra-II

The student will be familiar with basic knowledge of Vector spaces, subspaces, basis and dimensions Linear transformation, Isomorphism theorems, Diagonalization , Eigen vectors and linear operators.

Discrete Mathematics

The student will learn about the basic concept of discrete mathematics. The student will be able to solve difference equations with Recurrence relations and generating functions. The student will have sound knowledge of graph theory .

Number Theory

The course will enable the students to :

1) Learn about some important results in theory of numbers including divisibility, Fundamental theorem of Arithmetic and congruence's.
2) Familiarize with prime number theorem, Chinese remainder theorem, Wilson Theorem
3) Learn about Arithmetic functions, Mobius inversion formula, Greatest integer function
4) Know about Primitive roots and indices, residues, Diophantine equations
5) Solved related problems

M.Sc Mathematics

Courses outcomes

Semester I & II

ALGEBRA – I

Upon completion of the course , students will be able to

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

REAL ANALYSIS-I

Upon completion of the course, students will be able to

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

TOPOLOGY I

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

DIFFERENTIAL GEOMETRY

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

COMPLEX ANALYSIS

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

ALGEBRA-II

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

REAL ANALYSIS-II

Students will be able to

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

DIFFERENTIAL EQUATIONS

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

TOPOLOGY II

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

MATHEMATICAL METHODS

Students will be able to:

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

Semester III & IV

Functional Analysis

This Course will enable the students :

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

DIFFERENTIABLE MANIFOLDS

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

NUMERICAL ANALYSIS

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

FIELD THEORY

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

OPTIMIZATION TECHNIQUES-I

1) Introduce the concept of operation research along with models and general methods of solving thee models.
2) Familiarize students with Linear programming problem and different methods of solving these problems
3) Enable students to acquire the knowledge of Transportation and Assignment problems
4) Make student understand various methods of solving Transportation and assignment problems
5) Make students familiar with various methods and theories of games

GEOMETRY OF DIFFERENTIABLE MANIFOLDS

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

THEORY OF LINEAR OPERATORS

This Course will enable the students:

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

NUMERICAL ANALYSIS - II

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

Non-Linear Programming Problem

This Course will enable the students to:

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

Optimization Techniques -II

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

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

B.Sc.(Honors) Mathematics

Courses outcomes

Semester I &II

Calculus -l

The student on completion of the course will be having knowledge of

1) applications of calculus in various fields.
2) student will be able to evaluate the areas, volumes of Disks.
3) The student will be able to understand the basic theorems which will help in understanding analysis in coming years.

Algebra

On successful completion of the course the student will be having

1) sound knowledge of solution of system of equations.
2) The matrix theory will be known to the students.

Calculus -ll

The students will be able to

1) the concept of multivariate functions and vector analysis.
2) The applications of these topics to projectile and torsion will be known to them

Ordinary differential equations

The student will be able to

1) learn the solution of equations using differential equations.
2) The applications of differential equation in developing mathematical model will be known.

Semester III & IV

Analysis-l

1) To acquaint students with the fundamental properties like completeness of the real line.

2) To build up the concepts of size of sets and point set topology and to understand the proofs of theorems.
3) To give idea of sequences, subsequences, continuity and uniform continuity.

Linear algebra

Students completing this course will be able

1) To have deep knowledge of vector space and its properties.
2) Moreover, students will be able to find the null space of a matrix and represent it as the span of independent vectors.
3) To find the matrix representation of a linear transformation given bases of the relevant vector space.

Mathematical methods

This Course will enable the students to:

1) orthogonal properties, recurrence relations of Legendre, Chebyshev and Bessel's differential equation.
2) Solve initial value problems using Laplace transforms and integration of Laplace transforms of Fourier series, Fourier integrals, Fourier transforms

Probability and statistics

This Course will enable the students to:

1) Use the basic probability rules, including additive and multiplicative laws, using the terms independent and mutually exclusive events.
2) Explain the concepts of random variable, independent and jointly distributed random variables and conditional distributions, probability distribution, distribution function, expected value, variance and higher moments.
3) Calculate probabilities and derive the marginal and conditional distributions of bivariate random variables.
4) Define probability density function, moment generating function and use them to evaluate moments.
5) Define basic discrete and continuous distributions and be able to apply them

Analysis-ll

1) To make the student proficient in the theory of functions of bounded variations and Rectifiable Curves
2) To give insight of Reimann Steiltjes Integration and Convergence of both numerical Sequences and Sequences and Series of Functions.

Group theory -l

Upon successful completion of course students will

1) Have knowledge and skills to explain fundamental concepts of algebra such as groups, their properties and their role in modern mathematics.

2) decide whether a given group is cyclic, and given a finite cyclic group, find a generator for a subgroup of a given order
3) express a given finite cyclic group as the direct product of cyclic groups of prime power order and, given two direct products of cyclic groups, determine whether or not they are isomorphic

PDE and system of ODE

This Course will enable the students to:

1) the various techniques of finding solution of ordinary differential equations in more than two variables.
2) the idea of Lagrange's method for solving the first order PDE.
3) the origin of PDE and distinguish the integrals of first order linear PDE into complete, general and singular integrals.
4) Recognize the major classification of PDE and the qualitative difference between the classes of equations.
5) Be competent in solving PDE using classical solution methods.
6) Solving homogeneous heat, wave and laplace equation.

Number Theory

This Course will enable the students to:

1) about some important results in the theory of numbers including divisibility, Fundamental theorem of arithmetic, Congurences.
2) Familiarize with prime number theorem, Chinese remainder theorem, Wilson's theorem.
3) about arithmetic functions, Mobius inversion formula, Greatest integer function.
4) Know about Primitive roots and indices, residues, Diophantine equations.
5) Solve related problems.

Semester V & VI

Ring theory and linear algebra

The course will enable the students to

1) Learn basics of linear algebra and ring theory for further study in pure mathematics

Numerical methods

The course will enable the students to

1) Find the error analysis of numerical methods.
2) Appropriate numerical methods to solve algebraic and transcendental equations.
3) Understand the concept of numerical differentiation and numerical integration

Statistics and dynamics

The course will enable the students to

1) learn the methods to solve various problems in mechanics
2) learn the concept of motion.

Linear programming

After the course completion the student will be able to

1) learn various methods of solving diet problems, Production problems etc.
2) The students will learn the concept of transportation and assignment problems.

Metric space and complex analysis

The student will be able to

1) the concept of metric spaces.
2) idea of open, closed sets will be clear.
3) idea of complex functions and the concept of complex integration will be known to the students.

Tensor analysis

The students will be able to

1) Learn the basic concept of tensor
2) Make coordinate free approach

Integral equations and integral transformation

The successful completion of course will help the student to

1) have strong command over the subject.
2) student will be able to apply various transforms in solving numerical problems.

DISCRETE MATHEMATICS AND GRAPH THEORY

The student will be able to

1) learn the basic concept of graph theory.
2) The practical applications of the subject will be known to the student.
3) The student will be able to solve the difference equations using recurrence relations.

Department of Botany
B.Sc (Medical) Botany

Course Outcomes (CO)

Name of the course: Microbes, Fungi and Algae

Paper code: B.Sc (BOT)-106A (Paper A)

Course Outcomes:

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

1) Learn about the diversity among Microbes, Algae and Fungi.
2) Learn about the systematics, morphology and life cycle of Bacteria, Viruses, Fungi & Algae.
3) Learn about and become familiar with the interactions between different groups of organisms by studying Lichens and Mycorrhiza.

4) Learn about the economic importance of Microbes, Fungi and Algae.

Name of the course: Archegoniate
Paper code: B.Sc(BOT)-106B (Paper B)
Course Outcome
At the end of the Programme,Students will be able to:

1) Learn about the morphological diversity, anatomy, life cycle and economic importance of Bryophytes, Pteridophytes and Gymnosperms.
2) Learn about the Bryophytes, Pteridophytes and Gymnosperms on the basis of their morphological structure and anatomy.
3) Learn about the types of fossils and geological time scale.
4) Learn about the various methods of fossilization.

Name of the course: Plant Ecology
Paper code: B.Sc(BOT)-206A (Paper A)
Course Outcome
At the end of the Programme,Students will be able to:

1) Learn about the effect of different ecological factors on the growth of Plants and the structure and function of ecosystem.
2) Learn about plant communities and ecological adaptations in Plants in response to varied climatic conditions.
3) Learn about characteristics of population and community ecology.
4) Learn about the different biomes of world as well as India.

Name of the course: Plant Taxonomy
Paper code: B.Sc (BOT)-206B (Paper B)
Course Outcome
At the end of the Programme,Students will be able to:

1) Learn about the principles and rules of International Code of Nomenclature for Algae, Fungi and Plants (ICN) and role of other branches in Plant taxonomy.
2) Learn about different systems of classification for the Angiosperm.
3) Learn about the tools for Plant identification, Herbarium methods.
4) Learn about general characters and importance of important angiosperm families.

Name of the course: Plant Anatomy
Paper code: B.Sc(BOT)-306A (Paper A)
Course Outcome
At the end of the Programme, Students will be able to:

1) Learn about various tissue systems.
2) Learn about structure of dicot and monocot root, stem and leaf.
3) Learn about normal and anomalous secondary growth in Plants.

4) Learn about structure and seasoning of wood.

Name of the course: Plant Embryology
Paper code: B.Sc(BOT)-306B(Paper B)
Course Outcome
At the end of the Programme,Students will be able to:

1) Learn about structure and development in microsporangium and megasporangium.
2) Learn about process of microsporogenesis and megasporogenesis.
3) Learn about fertilization, endosperm types and their development and embryogeny.
4) Learn about process of fruit formation and its dispersal.

Name of the course: Plant Physiology
Paper code: B.Sc (BOT)-406A (Paper A)
Course Outcome
At the end of the Programme,Students will be able to:

1) Learn about the importance of water, mineral nutrition and hormones in the growth and developmental processes in Plants.
2) Learn about process of translocation of solutes in Plants.
3) Learn about various types of Plant movements.
4) Learn about plant responses to Abiotic and Biotic Stresses.

Name of the course: Plant Metabolism
Paper code: B.Sc (BOT)-406B (Paper B)
Course Outcome
At the end of the Programme,Students will be able to:

1) Learn about the different metabolites synthesized by Plants during the process of respiration and photosynthesis.
2) Learn about reduction-oxidation systems of Plants.
3) Learn about role of enzymes in metabolism
4) Learn about different metabolic pathways- Nitrogen, Sulphur and Lipid metabolism occurring in Plants.

Name of the course: Plant growth, development and biotechnology
Course Outcome
At the end of the Programme, Students will be able to:

1) Learn about the different technologies in biology of plants to understand its growth, growth kinetics
2) Learn about effect of light on germination and growth of seed and seedling under different environments.
3) Learn about different aspects of tissue culture.
4) Learn about applications of recombinant DNA technology in agriculture and industries.

Name of the course: Plant utilization
Course Outcome
At the end of the Programme, Students will be able to:

1) Learn about the origin, botany, cultivation and economic importance of food crops sugar crops.
2) 2. Learn about the origin, botany, cultivation and economic importance of fibre crops, oil seed crops, beverage crops.
3) Learn about the medicinal and aromatic plants and spices and condiments.
4) Learn about the origin, history, botany, cultivation, processing and uses of cannabis, cocoa and para rubber.

M.Sc. (Botany)

Course Outcomes
Semester I
Name of Course: Phycology and Bryology
Paper code: M-BOT-T-1.1
Course Outcome
At the end of the Programme, the students will be able to:

1) Identify the characteristic features of Algae.
2) Learn about the principles and systems of Algal classification.
3) Learn learn about the life cycles and interrelationships of important groups of Algae as well as economic importance of Algae.
4) Learn about the origin, classification and general characteristics of Bryophytes.
5) Learn about the alternation of generations of Class Hepaticopsida, Anthocerotopsida and Bryopsida.

Name of Course: Mycology
Paper code: M-BOT-T-1.2
Course Outcome:
At the end of the Programme, the students will be able to:

1) Identify the structure and ultrastructure of cell wall, growth and differentiation, fungal nutritional nomenclature.
2) Learn about the phylogeny, genetics, structure and reproduction in fungi.
3) Learn about the general account of different divisions of fungi.
4) Learn about the diversity and economic importance of different groups of fungi, and fungi like organisms.

Name of Course: Cell and Molecular Biology
Paper code: M-BOT-T-1.3
Course Outcome
At the end of the Programme, the students will be able to:

1) Learn about the ultra structure of prokaryotic and eukaryotic cell, cell organelles and cytoskeleton.

2) Learn about the structure of nucleic acids, mechanism of replication of genetic material, transcription and translation in prokaryotes and eukaryotes.
3) Learn about the variations in asexual reproduction in fungi, origin and evolution of sex in Fungi.
4) Learn about the biological control agents.

Name of Course: Cell and Molecular Biology
Paper code: M-BOT-T-1.4
Course Outcome
At the end of the Programme, the students will be able to:
1) Learn about the basic principles of Research Techniques, Laboratory Safety Protocols.
2) Learn about the preparation of solutions, principle and applications of microscopy.
3) Learn about the cell culture techniques, histochemical and immunological techniques.
4) Perform the centrifugation, spectroscopy, electrophoresis and chromatographic techniques.

Name of Course: Microbiology
Paper code: M-BOT-T-1.5
Course Outcome
At the end of the Programme, the students will be able to:
1) Learn about the characteristics, reproduction and life cycle of different microbial groups.
2) Learn about the structure and nutritional types of microbes.
3) Learn about the culture techniques, reproduction and economic importance of microbes.
4) Learn about the role of microorganisms in geochemical cycles.

Name of Course: Forest Botany
Paper code: M-BOT-T-1.6
Course Outcome
At the end of the Programme, the students will be able to:
1) Learn about the importance of forests, role of different agencies dealing with forestry.
2) Learn about the forest laws and policies, forest classification.
3) Learn about the forestry system, principal Indian timbers, forest utilization,
4) Learn about the forest management, forest mensuration and forest pathology.

Semester II
Name of Course: Pteridophytes and Gymnosperms
Paper code: M-BOT-T-2.1
Course Outcome
At the end of the Programme, the students will be able to:
1) Learn about the origin, classification, evolution of gametophyte and sporophyte of Liverworts, Hornworts and Mosses.
2) Learn about the fossil Pteridophytes, structure, reproduction and comparative account of different groups of Fern and Fern allies.
3) Learn about the fossil Gymnosperms, origin and evolution of Gymnosperms, cone and seed habit.
4) Learn about the structure and reproduction of different groups of Gymnosperms.

Name of Course: Plant Genetics
Paper code: M-BOT-T-2.2
Course Outcome
At the end of the Programme, the students will be able to:

1) Learn about the structure, and types of chromosome and genes, chromosomal alterations with reference to structure and number.
2) Learn about the Alien gene transfer and genetic recombination.
3) Learn about the mutations, DNA damage and repair, methods of gene mapping and different aspects of population genetics.

Name of Course: Plant Physiology
Paper code: M-BOT-T-2.3
Course Outcome
At the end of the programme the students will be able to:

1) Learn about the about the various physiological processes occurring in the plant cells.
2) Learn about the plant- water relations, uptake and transport of water by plants, signal perception and transduction.
3) Learn about the role of plant growth regulators, various aspects of stress physiology, significance of photobiology.
4) Learn about the mechanism of flowering process, programmed cell death, aging and senescence.

Name of Course: Plant Biochemistry and Metabolism
Paper code: M-BOT-T-2.4
Course Outcome
At the end of the programme the students will be able to:

1) Learn about the various metabolic pathways occurring in the plants.
2) Learn about the energy flow and macromolecules.
3) Learn about the photosynthetic and respiratory Processes.
4) Learn about the nitrogen, lipid, protein and sulphur metabolism and secondary metabolites.

Name of Course: Ethnobotany and Intellectual Property Rights
Paper code: M-BOT-T-2.5
Course Outcome:
At the end of the programme the students will be able to:

1) Learn about the historical perspectives and importance of ethnobotany.
2) Learn about the insight about the sacred plants and groves and plants of ethnobotanical and traditional knowledge.
3) Learn about the types and importance of intellectual property rights.
4) Learn about the laws and policies dealing with the protection of IPR at National and International level.

Name of Course: Environmental Toxicology
Paper code: M-BOT-T-2.6
Course Outcome
At the end of the programme the students will be able to:

1) Learn about the toxicology, types of toxicity, different types of toxicants and the dose response relationships of these toxicants.
2) Learn about the different pathways of absorption, distribution and excretion of toxicants and the biotransformation & bio-activation of these toxicants.
3) Learn about the toxic effects of these toxic substances and the methods of toxicity studies.
4) Learn about the cell lines and their applications.

Semester III
Name of Course: Plant Anatomy and Reproduction
Paper code: M-BOT-T-3.1
Course Outcome
At the end of the Programme, the students will be able to know:

1) Learn about the growth and differentiation of shoot and root apical meristem.
2) Learn about the anatomy of root, stem and leaf.
3) Learn about the Methods of vegetative reproduction in plants as well as the process of sexual reproduction including the microsporogenesis, megasporogenesis and fertilization,
4) Learn about the structure and development of embryo and endosperm.

Name of Course: Ecology and Phytogeography
Paper code: M-BOT-T-3.2
Course Outcome
At the end of the Programme, the students will be able to know:

1) Learn about the different types of ecosystems, energy flow in ecosystems, biogeochemical cycles.
2) Learn about the studies of population community with relation to ecosystem,
3) Learn about the concept related to habitat, ecological succession
4) Learn about the descriptive (world floristic zones) and interpretive phytogeography, GIS (Geographical Information System) and GPS (Geographical Positioning System) and their applications.

Name of Course: Plant Resource Utilization
Paper code: M-BOT-T-3.3
Course Outcome
At the end of the Programme, the students will be able to:

1) Learn about the origin, botany, cultivation and economic importance of food crops sugar crops.

2) Learn about the origin, botany, cultivation and economic importance of fibre crops, oil seed crops, beverage crops.
3) Learn about the medicinal and aromatic plants and spices and condiments.
4) Learn about the origin, history, botany, cultivation, processing and uses of *cannabis,* cocoa and para rubber.

Name of Course: Research Techniques
Paper code: M-BOT-T-3.4
Course Outcome
At the end of the Programme, the students will be able to:

1) Learn about the Laboratory Safety Protocols
2) Learn about the various research techniques commonly used in life sciences including microscopy, spectroscopy, and electrophoresis, chromatographic techniques in addition to the histochemical and immunological techniques.
3) Learn about the principle and methods of histochemical localization of carbohydrates, lipids, proteins, nucleic acids and enzymes.
4) Learn about the antigen-antibody interactions, enzyme linked immunosorbent assay (elisa) and western blotting, radioimmunoassay.

Name of Course: Research Techniques
Paper code: M-BOT-T-3.5
Course Outcome
At the end of the Programme, the students will be able to:

1) Learn about the scope and objectives of plant pathology, concept of disease in plants.
2) Learn about the major causes and concept of disease and disease management in plants.
3) Learn about the disease epidemiology, epiphytotics and disease appraisal.
4) Learn about the mechanism of pathogen attack and defense mechanisms adopted by plants during pathogen attack.

Name of Course: Biostatistics and Bioinformatics (Optional ii)
Paper code: M-BOT-T-3.6
Course Outcome
At the end of the Programme, the students will be able to:

1) Learn about the various techniques related to statistical methods, analysis of variance and different tools.
2) Learn about the data mining procedures, software's used in bioinformatics along with its applications.
3) Learn about the sequence analysis, sequence alignment and its types.
4) Introduction to database search engines: PubMed, OMIM and MEDLINE.
5) Learn about the concept related to Genomics and Proteomics.

Semester IV

Name of Course: Crop Genetics and Plant Breeding

Paper code: M-BOT-T-4.1

Course Outcome

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

1) Learn about the basic principle of crop genetics, role of qualitative and quantitative traits in determining the genetic variance.
2) Learn about the reproduction in plants in the role of selection methods and procedure to release new varieties.
3) Learn about the details of hybridization and mutation breeding.
4) Learn about the methods of plant breeding, release of new varieties: evaluation trials, tests, agencies, registration of new varieties.
5) Learn about the importance of quality seeds and types & importance of molecular markers is also taught to students.

Name of Course: Biodiversity and Global Climate Change

Paper code: M-BOT-T-4.2

Course Outcome

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

1) Learn about the concept of biodiversity and sustainable development.
2) Learn about the factors affecting biodiversity loss and strategies for biodiversity conservation and management around the world and in India.
3) Learn about the Phenomenon of climate change, principal challenges and opportunities for climate change.
4) Learn about the action and international efforts and legal instruments to mitigate climate change.

Name of Course: Plant Cell, Tissue and Organ Culture

Paper code: M-BOT-T-4.3

Course Outcome

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

1) Learn about the basic techniques and scope of plant cell and tissue culture, nutrient media, application of tissue culture in biotechnology.
2) Learn about the various types of cultures and their applications.
3) Learn about the synthetic seed production and haploid production.
4) Learn about the production of secondary metabolites.

Name of Course: Biotechnology and Genetic Engineering

Paper code: M-BOT-T-4.4

Course Outcome

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

1) Learn about the methods of recombinant dna technology.

2) Learn about the DNA sequencing strategies, production of transgenic plants using different types of cloning vectors.
3) Learn about the gene amplification and molecular markers.
4) Learn about the application of microbes in biotechnology and bioremediation.

Name of Course: Plant Diseases and Management (Optional i) (Pre-requisite is M-BOT-3.5)
Paper code: M-BOT-T-4.5
Course Outcome
At the end of the Programme, the students will be able to:

1) Learn about the symptoms, disease cycle, and control measures of diseases caused by Protozoic and Oomycetous fungi.
2) Learn about the symptoms, disease cycle, and control measures of diseases caused by Chytridiomycetous, Zygomycetous and Ascomycetous Fungi.
3) Learn about the symptoms, disease cycle, and control measures of diseases caused by Basidiomycetous Fungi and Bacteria.
4) Learn about the basic principles of plant disease management and application of biotechnology in plant disease management.

Name of Course: Agricultural Botany (Optional ii)
Paper code: M-BOT-T-4.6
Course Outcome

1) Learn about the centres of origin, cytology and genomic analysis of different field crops.
2) Learn about the morphology and reproductive biology of important field crops.
3) Learn about the cytology and genomic analysis of important crops of Punjab.
4) Learn about the concept of diseases affecting different field crops.

Department of Agriculture
B.Sc. (Hons.) Agriculture

Course Outcomes
Semester I
Fundamentals of Horticulture
Learning objectives:

1) To know about different methods of training, pruning and plant propagation methods.
2) To gain knowledge about cultivation of medicinal and aromatic plants.

Learning outcomes:

The students will learn different training, pruning methods and propagation methods which help them to produce plants commercially.

Fundamentals of Soil Science
Learning objectives:

To teach about the soil forming rocks and minerals. Weathering, processes and factors of soil formation and Soil Profile.

Learning outcomes:

1) To Know about the soil formation.
2) To Know about the weathering process of rocks & minerals
3) To Know about the different soils horizons.

Introduction to Forestry

Learning objective:

To teach about the objectivesofsilviculture, forest classification, and salient features of Indian Forest Policies.Forest mensuration- Non instrumental methods of height measurement - shadow and single pole method.

Learning outcomes:

To know about the silviculture, forest classification & forest mensuration.

Fundamentals of Agronomy

Learning Objectives:

1) To get the students acquaint with basic information of agronomy practices and management of crops from different weeds.
2) To get the students acquaint with the method of farm ard manure and vermicompost preparation.

Learning Outcomes:

1) Students will acquire knowledge about different herbicides which is important for weed control in Rabi crops.
2) Students will learn about the different sowing methods, cultural practices and management of Rabi crops.

Introductory Biology

Learning Objectives:

To study the basics of living world and diversity of living world. To study the cell, tissues and division of cells in plant kingdom.

Learning Outcomes:

To gain the knowledge of living world and diversity. Learner will also understand the concept of cell and division as well as morphology of flower.

Agricultural Microbiology

Learning objectives:

1) To teach about the role of microorganisms in agriculture.
2) To understand the learners about the growth and nutrition of microorganisms and their role in production of biofertilizers and biopesticides etc.

Learning outcomes:

1) Students will learn about the microorganisms which play important role in agriculture by producing chemical free fertilizer and pesticides.
2) They will learn about the role of microbes in soil fertility and crop production.

Fundamentals of Agriculture Extension

Course Objective:

1) To facilitate the students to be aware of the dissemination of knowledge among farmers with the adoption of various methods of Agricultural Extension Programmes to achieve the tasks of Community Development by raising the economic standards of Farmers.

Course learning outcome:

1) To gain the acquaintance about different methods of Agriculture Extension.
2) To gain the awareness about how to disseminate the knowledge among farmers to facilitate them to get higher returns from their farm Produce.
3) Helps to Understand the present conditions of farmers by the use of latest Technologies.

Rural Sociology and Educational Psychology

Course Objective:

1) To facilitate the students to be aware of the dissemination of knowledge among farmers with the adoption of various methods of Agricultural Extension Programmes to achieve the tasks of Rural Development by raising the economic standards of Farmers.
2) To ease the students to be attentive to understand the psychology of Rural People.

Course learning outcome:

1) To understand the rural life in a better way, to identify the real problems of rural people by learning the psychology and helps to find out possible solutions for the improvement in living standards of farmers.
2) To gain the knowledge about Rural Society, Cultural Concepts

Semester II

Soil and Water Conservation and Engineering

Learning Objectives :

1) To familiarize with different surveying methods used in field.
2) To familiarize with sprinkler and drip irrigation system.

Learning outcomes:

1) Student will learn how to conserve and manage water for optimize use.
2) Student will learn to tackle with problems like soil erosion and water erosion.

Environment and Road safety

Learning Objectives :

1) To acquaint students about earth ecosystem, land resources and environmental pollution
2) To give knowledge about different movements happened in India.
3) To provide knowledge about road safety , traffic rules and signs.

Learning outcomes:

1) Student will learn about different environment pollution and how to contol them.
2) Students will learn about different traffic rules which will help them in road safety.

Fundamentals of plant biotechnology and biochemistry

Course objectives:

1) To enable the students understand the basic concept of biotechnology and its branches especially recombinant DNA technology and plant tissue culture.
2) To understand the usage and importance in agriculture and human health.

Course outcomes:

1) To gain the knowledge about different techniques of biotechnology and plant tissue culture.
2) To gain knowledge about vectors, recombinant enzymes, gene technologies in human health.

Fundamentals of Crop Physiology

Course Objective:

1) Students will learn about plant cell and concept of photosynthesis in plants .
2) Students will also learn about mineral nutrition of plants and their mechanism of uptake.

Course Outcomes:

To gain the knowledge about cells in plants and their structure. Learners will understand the different mechanisms of plants.

Fundamentals of Genetics

Course Outcomes:

1) To study the basics of genetics.
2) To study mutation ,chromosomes and gene concept.

Course Learning Objectives:

Students will learn the knowledge of gene concept. They will also learn about the inheritance and Mendelian ratios.

Fundamentals of Plant Pathology

Course Objectives:

1) To study the introduction, definition of disease and terminology use in plant disease.
2) To study the different viruses and bacteria.

Course Learning Outcomes:

To gain the knowledge of different terminology used in plant pathology. Learner will also understand the concept of fungi and their reproduction.

Agricultural Heritage

Learning objectives:

To teach about status of agriculture and farmers in society. Also teach about concerns and future prospects of agriculture.

Learning outcomes:

1) To know about agricultural heritage and its relevance to agriculture.
2) To give knowledge about significance and classification of crops.

Semester III

Rural Sociology and Educational Psycology

Learning Objectives:

1) To provide knowledge about rural society and social straification
2) To give knowledge about different theories of motivation.

Learning outcomes:

Student will know different social groups which will help them to know society in a better way.

Farm machinery and power

Learning Objectives:

1) To provide the knowledge about tractor engines, different systems of tractor, different operations, implements and cost of operation.
2) Students will learn about the role of technology and new implements in the agriculture.

Learning outcomes:

Students will learn about tractors and become familiar with its system which will helpful during working in the field.

Fundamentals of Plant Breeding

Learning objective:-

To teach about thebreeding methods in self- pollinated crops - mass and pure line selection, hybridization techniques and handling of segregating population. Multi-line concept.

Learning outcomes:-

1) To Know about the different methods of self pollinated crops.
2) To Know about the different methods of Cross pollinated crops.
3) To know about the hybridization techniques.

Livestock and Poultry Management

Learning objectives:

1) To teach about the Role of livestock in the national economy and management of poultry and animals.
2) To teach about the prevention, vaccination and control of important diseases of livestock. Feed ingredients for livestock and poultry.

Learning outcomes:

1) Students will learn about the management of animals and poultry,about their diseases , vaccination and feed.

2) Students will learn about the Indian and exotic breeds of cattle, buffalo, sheep, goat, swine and poultry.

Diseases of Horticulture Crops and the Management

Course Objectives:

1) To study the introduction, definition of disease and terminology use in plant disease.
2) To study the different horticulture crops .

Course Learning Outcomes:

To gain the knowledge of different terminology used in plant pathology. Learner will also understand the concept of different diseases of horticulture crops and their management.

Production Technology of Vegetables and Spices

Course Objective:

1) To help the students to be aware of Importance of vegetables in human nutrition and national economy.
2) To Impart the Practical Knowledge among Students by learning by doing by raising of seasonal Vegetables and Spices.

Course learning outcome:

1) To help to grow seasonal Vegetables and Spices with sound technical know-how.
2) To learn about high yielding hybrids and varieties.

Production Technology of Vegetables and Spices

Course Objective:

1) To help the students to be aware of Importance of vegetables in human nutrition and national economy.
2) To Impart the Practical Knowledge among Students by learning by doing by raising of seasonal Vegetables and Spices.

Course learning outcome:

To help to grow seasonal Vegetables and Spices with sound technical know-how. To learn about high yielding hybrids and varieties.

Rural Sociology and Education Psychology

Course Objective:

1) To facilitate the students to be aware of the dissemination of knowledge among farmers with the adoption of various methods of Agricultural Extension Programmes to achieve the tasks of Rural Development by raising the economic standards of Farmers.
2) To ease the students to be attentive to understand the psychology of Rural People.

Course learning outcome:

1) To understand the rural life in a better way, to identify the real problems of rural people by learning the psychology and helps to find out possible solutions for the improvement in living standards of farmers.
2) To gain the knowledge about Rural Society and Cultural Concepts.

Semester IV

Renewal Energy and Green Technology

Learning Objectives :

1) The aim of this course, provide the knowledge of energy sources, role of renewable energy, technology and new appliances related to green energy in the agriculture.
2) To study the importance of renewable energy, its source, how they are important and utilization of sources.

Learning Outcomes:

1) Students will understand the importance of renewal energy resources and its utilization.
2) The course should enable the students acquire the knowledge of biogas, its application, fuel cell, solar, wind and various components used in energy production.

Farming System and Sustainable Agriculture

Learning Objectives:

1) To acquaint the students with conventional and alternative agricultural production practices and their effect on long term sustainability and environmental quality.
2) To show how agriculture are attempting to minimize agricultural pollution and sustain food production adequate for the increasing population.

Learning outcomes:

1) The student will have studied and analyzed sustainable crop production intensification will offer a range of productivity **,** socio-economic and environmental benefits to produces and to society.
2) The student will be able to explain in general the relationships among culture, economics, policies, science and agricultural development.

Crop Production Technology-II (Rabi Crops)

Learning Objectives:

1) To familiarize students with basic principles of agronomic practice of rabi crops.
2) To learn different types of methods of intercultural operations operated during crop cycle.

Learning outcomes:

1) Students will learn to grow crops for commercial purpose.
2) Students will learn to grow crops with minimum input and get maximum output.

Problematic Soils and their Management

Learning objective:-

To teach about the Soil quality and health. Distribution of Waste land and problem soils in India. Their categorization based on properties.

Learning outcomes:-

To Know about the Soil quality and health&Distribution of Waste land and problem soils in India.

Weed Management

Learning objective:-

To teach about theIntroduction to weeds, characteristics of weeds their harmful and beneficial effects on ecosystem. Herbicide classification.

Learning outcomes:-

To Know about the introduction to weeds &characteristics of weeds their harmful and beneficial .

Production Technology for Ornamental Crops, MAPs and Landscaping

Learning Objective:

To teach about the production technology of ornamental crops and medicinal crops. Also teach about the detailed knowledge of landscape gardening.

Learning Outcomes:

1) To know about the uses of ornamental and medicinal trees, shrubs and climbers.
2) To give scientific knowledge about the cultivation and processing of ornamental, aromatic and medicinal crops.
3) To know about the landscaping and its features.

Crop Production Technology –II (Rabi Crops)

Learning Objectives-

To get the students acquaint with information about Origin, geographical distribution, economic importance, soil and climatic requirements, varieties, cultural practices and yield of Rabi crops.

Learning Outcomes-

1) Students will study the different sowing methods and cultural practices of Rabi crops.
2) Students will learn the different soil and climatic conditions are requirement for different crops.

Principles of Seed Technology

Course Objective:

To acquaint the students to be attentive of seed technology, Seed quality, Maintenance of genetic purity during seed production. Foundation and certified seed production of important cereals, Pulses and Oilseeds fodder and vegetables and seed marketing etc. which are important aspects of seed technology.

Course learning outcome:

1) To get the practical knowledge of Foundation and certified seed production of important cereals, Pulses and Oilseeds fodder and vegetables.
2) To help to understand the importance and utility of seed industry.

Food Safety and standards

Course outcomes:

1) To understand different laws for food safety.
2) To gain knowledge about genetically modified foods. Learner will also understand about product labeling and nutritional labeling.

Semester V

Introduction to biotechnology

Course objectives:

1) To enable the students understand the basic concept of biotechnology and its branches especially recombinant DNA technology.
2) To understand the usage and importance in agriculture and human health.

Course outcomes:

1) To gain the knowledge about different techniques of biotechnology and plant tissue culture.
2) To gain knowledge about vectors, recombinant enzymes, gene technologies in human health.

Principles of food science and post-harvest management

Course Objective:

1) To enable the students understand the chemistry and importance of water, carbohydrates, lipids, proteins and vitamins.
2) To understand the role of vitamins in human nutrition and the effect of various processing methods in maintaining the vitamin content in foods.

Course learning outcome:

1) To name and describe the general chemical structures of the major components of foods (water, proteins, carbohydrates, and lipids) and selected minor components (vitamins and minerals). To relate the chemical composition of foods to their functional properties.
2) To apply their knowledge in food biochemistry and nutrition in designing new range of products with improved nutritional characteristics

Crop improvement

Learning objective:-

To teach about theHybrid seed production technology in cereals& Pulses.

Learning outcomes:-

1) To Know about the hybrid seed production technology in different crops
2) To know about the Centers of origin, distribution of species, wild relatives, Floral biology in cereals & pulses.

Production Technology of Ornamental Crops and Landscaping

Course Objective:

1) To help the students to be aware of Importance of status and scope of ornamental crops in India and its potential trade in in globe.
2) To learn about Production technology of important flowers under open and protected conditions, Lawn management, Landscaping and Post Harvest Management.

Course learning outcome:

To help to raise seasonal important flowers under open and protected conditions with precise production technology , pot plants Lawn management, Landscaping and Post

Harvest Management, Preparation of landscaping plan for homes, farm complex, small parks and institutions, Landscape uses pot plants.

Fundamentals of Agriculture Extension

Course Objective:

To facilitate the students to be aware of the dissemination of knowledge among farmers with the adoption of various methods of Agricultural Extension Programmes to achieve the tasks of Community Development by raising the economic standards of Farmers.

Course learning outcome:

1) To gain the acquaintance about different methods of Agriculture Extension.
2) To gain the awareness about how to disseminate the knowledge among farmers to facilitate them to get higher returns from their farm Produce.
3) Helps to Understand the present conditions of farmers by the use of latest Technologies.

Semester VI

Dairy Technology

Teaching Objectives–

1) Students will learn about the basics of dairy processing. Students will evaluate composition of milk, principles & methods of milk processing.
2) To teach them about the preparation & principles of milk products and plant sanitation and effluent disposal.

Learning Outcomes-

1) Students will learn about to name and describe the beneficial and spoilage microorganisms associated with food. Learners will perform experiments to check sterility of milk and study various physiochemical properties and microbiological standards of milk.
2) To understand the growth and methods of isolation of microorganisms from food to evaluate the role of microorganisms in various foods and water.
3) Learners will gain awareness about microbiology of milk & processed milk products.

Analytical Techniques In Soil, Plant, Fertilizer And Water

Learning objective:-

To teach about the Soil fertility evaluation. Analysis of soil and plant samples for N, P, K. Soil, water and plant sampling techniques, their processing and handling.

Learning outcomes:-

1) To Know about theSoil fertility evaluation.
2) To Know about theSoil, water and plant sampling techniques, their processing and handling

Post-Harvest Management Of Horticultural Crop And Value Addition.

Learning objectives:

To teach aboutdetailed knowledge ofpost harvest management of horticultural crops. Also teach about process of preapartion of different products.

Learning outcomes:

1) To know about post harvest disease and disorders.
2) To give knowledge about process of making jam, jelly, marmalade, canning.
3) To know about packaging, preservation, drying and dehydration.

Principles of Organic Farming

Learning objectives:

To give detailed knowledge about organic farming. Also about processing, marketing and export of organic products.

Learning outcomes:

1) To teach about present and future scope and outcomes of organic farming.
2) To give knowledge about initiatives taken by govt., NGO's and process of certification and standards of organic farming.
3) To teach about management of insects, pests, disease and weed management under organic farming.

Production Technology of Spices, Plantation Medicinal And Aromatic Plants

Objectives:

To know about cultivation of different spices, plantation, medicinal and aromatic plants**.**

Course learning outcomes:

The students will become aquainted with the origin, classification, taxonomy, species, area and package and practices of various medicinal plants, aromatic plants and spices.

Semester VII

Agronomy- I

Learning Objectives-

1) To get the students acquaint with basic information and techniques of organic farming, Sustainable agriculture and Farm Cropping System.
2) To get the students acquaint with basic information of agronomy practices and management of crops from different weeds.

Learning Outcomes-

1) Students will gain awareness about the types of farming, system of farming, farm planning and different method of seed testing.
2) Students will identify and classify the herbicides which is important for weed control.

PAPER-A: Fundamentals of Fruit Production

Course objectives:

To enable the students understand the various problems associated with fruit crops and their remedies. To understand the usage and importance of different intercultural practices in fruit production.

Course outcomes:

1) To gain the knowledge about different techniques used in fruit production.
2) To gain the knowledge about different methods to control physiological disorders.

Paper B: Systematic Pomology

Course Objective:

To enable the students understand the role of rootstocks in fruit production. To understand the different methods of propagation and systematics of fruits.

Course learning outcome:

1) To gain the knowledge about different schemes for horticulture.
2) To gain the knowledge about research, working and achievement for horticultural development.

Semester VIII

Subject: Horticulture-II

Learning objectives:

To give detailed knowledge about forestry, its scope and importance. Also to teach about cultivation practices of different forest trees.

Learning outcomes:

1) To give knowledge about forests, its resources and different products.
2) To teach about forest ecosystem, wild life conservation and also about natural disasters.

Agronomy –II

Learning Objectives-

To Study about the Agronomic practices with special reference to rotations, planting techniques, Crop Production under Dry farming and plant nutrients.

Learning Outcomes-

1) Students will acquire knowledge about effect of moisture stress on physiological processes, methods of Soil fertility evaluation and functions of plant nutrients.
2) Students will identify the chemicals which are use in dry farming.

PAPER C: POMOLOGY

Course learning outcomes:

The students will become familiar with the package and practices of fruit crops and economics of fruit growing, processing and marketing.

Agricultural Extension

Course Objective:

To facilitate the students to be aware of the dissemination of knowledge among farmers with the adoption of various methods of Agricultural Extension Programmes to achieve the tasks of Community Development by raising the economic standards of Farmers.

Course learning outcome:

1) To gain the acquaintance about different methods of Agriculture Extension.
2) To gain the awareness about how to disseminate the knowledge among farmers to facilitate them to get higher returns from their farm Produce.

3) Helps to Understand the present conditions of farmers by the use of latest Technologies.

B.Voc. Food Processing

Course outcomes

Semester I

Dairy technology

Course Objective:

1) To understand about milk, milk processing methodologies.
2) To provide knowledge about the milk processing equipments.
3) To provide technical know-how about the production of milk products (ice creams, fermented milk products)

Course learning outcome:

1) To gain knowledge on milk source and composition.
2) To understand the various milk processing methods.
3) To demonstrate hands-on skills in manufacturing selected dairy products in a pilot plant setting.
4) To evaluate the safety and quality factors that determine the acceptability of the dairy products by consumers

Food chemistry and nutrition

Course Objective:

1. To enable the students understand the chemistry and importance of water, carbohydrates, lipids, proteins and vitamins.
2. To understand the role of vitamins in human nutrition and the effect of various processing methods in maintaining the vitamin content in foods.

Course learning outcome:

1) To name and describe the general chemical structures of the major components of foods (water, proteins, carbohydrates, and lipids) and selected minor components (vitamins and minerals).
2) To relate the chemical composition of foods to their functional properties.
3) To apply their knowledge in food biochemistry and nutrition in designing new range of products with improved nutritional characteristics

Introductory Food Microbiology

Learning objectives:

1) To teach the learners about the cultivation of microorganism which play important role in food production and spoilage.
2) To make the learner to know about the physical, chemical and microbiological parameters for hygienic production of food.

Learning Outcomes:

1) Students will learn about the food production by using microorganisms .
2) They will learn about the food born illness causes and preventions.
3) They will learn about the cultivation techniques of microorganisms and formation of nutritional media.

Semester II

Cereals and legume processing

Learning Objectives-

To get the students acquaint with information about Structure and chemical composition of cereals and pulses also applicatons of their flour products.

Learning Outcomes-

1. Students will learn about the Importance Milling of Wheat flour , Parboiling of rice and Drying of legumes.
2. Students will gain awareness about the working of machinery and equipments employed in milling industry.

Fundamentals of Food processing

Course learning outcome:

1. The students understand the operation and various factors affecting food processing equipment.
2. The students learn to select suitable processing equipment.
3. To develop unit operation system for food processing.

Subject: Fruit and Vegetable processing

Course learning outcome:

1) To understand the production status and post harvest handling methods of fruits and vegetables.
2) To learn the methods of processing and preservation of freshly harvested and cut fruits and vegetables. To understand the dehydration methods and design of driers used for drying fruit and vegetables. To describe the aseptic technology for product preservation.

Semester III

Food products packaging technology

Learning Objectives:

1) To provide knowledge about different types of packaging material used for various food products.
2) To give students knowledge about rules and regulation in food packaging material.

Learning outcomes:

1) The students will learn to identify different categories of packaging material and packaging requirements for various food products.

2) Students will learn about the role of Food Safety Standards and Regulations in developments and utilization of food packaging materials**.**

Documentation In Food Processing

Course Learning Outcomes:

The course will help in better understanding the importance of documentation in food processing industries. Students will also gain the information about applications of computer and programs needed to inspect raw materials in different food industries.

Basics of food packaging

Course learning outcome:

1) To study about the functions of packaging along with the influence of various factors on food.
2) To know about the different packaging materials like cans, bottles, flexible films etc.
3) To enable the students to understand applications of various packaging materials in food industry.
4) To understand food quality and need food packaging.

Introduction to grain milling & machineries

Course learning outcome:

1) To the principle and working of various processing equipments.
2) To know the methods of product recovery of different equipments. Students can select suitable unit operations for a specific purpose

Semester IV

Food Spoilage and Control

Course Objective:

1. Students will gain information about about food adulteration and spoilage of food by various physical, chemical and microbiological agents.
2. Students will also learn about various techniques to isolate and identify microorganisms from food samples.

Course learning outcome:

1. To know the methods of preservation of foods. Students will develop knowledge about bacterial and non-bacterial food born diseases.
2. Learners will learn various techniques to isolate and identify microorganisms from food samples.

Food industry waste management

Course Objective: Student will learn about classification & characterization of waste from different food processing industries. Student will acquire knowledge about treatment methods for solid waste and wastewater.

Course learning outcome: To enable the student, understand the nature of food wastes and methods of treatment. To enable the student, know the importance of waste utilization in Food

industries. Students will attain knowledge about various legalizations on food industry and its environmental impact. Students will gain knowledge on getting value-added products from wastes.

Food plant design and layout

Course learning outcome:

1) To gain knowledge on the various factors involved in setting up a Food Processing Industry.
2) To understand the process of food plant layout design and apply their knowledge to design projects for setting up a Food Processing Industry.

Egg, Meat, Poultry and Fish Processing

Course learning outcome:

1) To understand the slaughtering, carcass processing methods and equipments used for processing meat.
2) To understand the HACCP of meat processing.
3) To evaluate the processing of poultry meat, meat products and egg products.
4) To predict the role of microorganisms in spoilage, biochemistry, preservation of meat and fishery products.

Semester V

Food industry waste management

Learning objectives:

1) To make the learner to understand different industrial Waste Treatment and Disposal.
2) To make the learner to know about the production of useful products from industrial waste.

Learning outcomes:

1) Students will learn about the Waste disposal methods – Physical, Chemical &Biological treatment methods of solid wastes.
2) Students will develop knowledge about Vermicomposting Pit., Biofilters and Bioclarifiers, Ion exchange treatment of waste water. Drinking-Water treatment
3) Students will acquire knowledge about the Recovery of useful materials from effluents by different methods.

Sugar processing technology

Course learning outcome:

1) The students have gained knowledge on the ingredients of confectionery products. The students have gained knowledge of the process and machinery involved in bakery and confectionery technology.
2) The students have acquired experience of entrepreneur skills of conefectionery processing.

Diploma in Agriculture

Course outcomes

Semester III

Farm mechanization

Learning Objectives:

1) To provide the knowledge about tractor engines, different systems of tractor, different operations, implements and cost of operation.
2) Students will learn about the role of technology and new implements in the agriculture.

Learning outcomes:

1) Students will learn about tractors and become familiar with its system which will helpful during working in the field.
2) They become familiar with different kind of implements used in agriculture, their required adjustments and the financial aspects of using farm power.

Farm irrigation and drainage

Learning Objectives:

1) To provide knowledge about method of irrigation.
2) To give knowledge about different types of pumping system, wells and drainage system

Learning Outcomes:

1) Students will know different sources and methods of irrigation which will be helpful for them to plan irrigation system according to crop requirement.
2) Student will learn about drainage system requirement of different crops.

Subject: Diseases of field crops

Course Objectives:

To study the different diseases and their management of different crops.

Course Learning Outcomes:

To gain the knowledge of diseases and their management. Students will also learn the concept of different diseases of crops.

Elementary Agro-processing

Learning objective:-

To teach about theConcept of agro processing and its importance in context of Punjab. Concept of Agro-processing complexes, Layout and planning of agro-processing complex.

Learning outcomes:-

1) To Know about the Concept of agro processing and its importance in context of Punjab.
2) To know about the Layout and planning of agro-processing complex.

Plant Breeding and seed production

Learning objective:-

To teach about theMethods of breeding, introduction, selection in self and cross pollinated crops.Seed testing for quality assessment, Seed health. Seed treatment, Seed storage, Seed marketing.

Learning outcomes:-

1) To Know bout the different breeding methods &Seed testing for quality assessment, Seed health. Seed treatment, Seed storage, Seed marketing.
2) To Know about the different soils horizons.

Subject: Agricultural Entomology

Learning Objectives-

To Study about the influence of insects and pests on crop yield by considering the management aspects.

Learning Outcomes-

1) Students will learn about the Importance of insects in Agriculture and Growth and development of insect.
2) Students will gain awareness about the methods of insect-pests management and Integrated Pest Management.

Semester IV

Mushroom Cultivation

Learning Objectives:

1) To provide knowledge about cultivation of mushrooms in different seasons.
2) To enable the students about post harvest care of mushrooms.

Learning Outcomes:

1) Student will know how to cultivate mushrooms for commercial level.
2) Student will learn different diseases how mushrooms and methods to control them.

Plant tissue culture

Course objectives:

1) To enable the students understand the concept and history of plant tissue culture and their techniques.
2) To understand the economic aspects of in vitro propagation.
3) To understand the commercial aspects of in vitro propagation.

Course outcome:

To gain knowledge of plant tissue culture and its techniques.

Diseases of Fruits and Vegetables

Course Objectives:

1) To study the introduction, definition of disease and terminology use in plant disease.
2) To study the different horticulture crops .

Course Learning Outcomes:

To gain the knowledge of different terminology used in plant pathology. Learner will also understand the concept of different diseases of horticulture crops and their management.

Elementary Extension Education

Teaching Objectives:

1) To makes the learner to know about the principles and procedure of extension education and their methods.
2) To make them to learn about the qualities and abilities of good extension worker.

Learning Outcomes

1) Students will learn principal and procedure of extension education**.**
2) They will learn extension teaching methods by using audio visual aids.
3) They will develop the qualities of good extension worker.

Department of Zoology
M.Sc. (Zoology)

Course Outcomes

Semester I

Biosystematics and Taxonomy

Course Objectives

To give students a thorough understanding in the principles and practice of biosystematics. This course will help the students to acquire an in depth knowledge on the diversity and relationships existing in the animal world. Taxonomic concepts will help to develop a holistic appreciation of the phylogeny of animal world and of different taxonomic tools used in the classification.

Course Outcomes

On completion of the course, the student is expected to be able to know the basic concept of biosystematics and procedure in taxonomy. Identified the taxonomic status of the entire animal world and discuss the evolutionary model of the group.

Evolutionary Biology

Course Objectives

This course is aimed at providing an understanding of evolutionary patterns and relationships. The students will be able to get insight into the process and patterns of biological evolution and the role of evolution as the central unifying concept of biology

Course Outcomes

After completion of the course, student will gain knowledge about, Theories of Evolution, eras and evolution of species, evolutionary process such as variation, speciation, natural selection, origin of primates and man.

Molecular Biology

Course Objectives

To acquaint students the knowledge of concepts of molecular biology, current biotechnology and its applications.

Course Outcomes

After completion of this course students will be able to:

1) Explain the process of inheritance.
2) Describe how RNA, DNA and proteins are synthesized, mechanisms of life including replication, transcription and translation.
3) Describe process of gene regulation of every vital body activity.

Developmental Biology

Course Objectives

To make students understand the concept of cell signalling, Axis and pattern formation in development.

Course Outcomes

Students who successfully complete this course will be able to:

1) Outline and compare the developmental stages which occur in a variety of animal phyla.
2) Explain the mechanisms which lead to cell determination.
3) Describe the evolutionary conservation of developmental mechanisms.

Concepts of Ecology

Course Objectives

To define the basic rules and concepts of the ecology science. To define the ecology of individual, population, community and ecosystem. To define the concepts that is the ambient, environment, biome, biosphere, ecosphere, ecological relationship and factors, and homeostasis.

Course Outcomes

Students who successfully complete this course will be able to:

1) Describe animal distribution patterns in relation to abiotic and biotic factors.
2) Define the essential characteristics underlying natural ecosystems.
3) Explain model population and community-level dynamics.
4) Interpret and present ecological results.

Semester II

Cytogenetics

Course Objectives

The course will enable the students to understand Mendelian and post Mendelian modes of inheritance, Mutation and Genetic analysis.

Course Outcomes

Students will learn to

1) Demonstrate an advanced knowledge human Cytogenetics and disease;
2) Perform human cell culture, chromosome preparations, karyotyping and analysis of chromosomes;

3) Diagnose and interpret pathology of chromosomes (chromosome aberrations, trisomy, rearrangements etc.

General Physiology

Course Objectives

This course will provide students with the understanding of basic physical and chemical principles underlying the physiological processes and how animals adapt physiologically to the environment changes.

Course Outcomes

Students will learn to explain the basic knowledge of animal physiology. Defines various systems, metabolism, working and abnormalities of the animal body.

General Physiology

Course Objectives

This course will provide students with the understanding of basic physical and chemical principles underlying the physiological processes and how animals adapt physiologically to the environment changes.

Course Outcomes

Students will learn to explain the basic knowledge of animal physiology. Defines various systems, metabolism, working and abnormalities of the animal body.

General Immunology

Course Objectives

This course is aimed at providing an understanding of evolutionary patterns and relationships. The students will be able to get insight into the process and patterns of biological evolution and the role of evolution as the central unifying concept of biology

Course Outcomes

Imparts in depth knowledge of tissues, cells and molecules involved in host defence mechanisms. Understanding of types of immunity CO3 Interactions of antigens, antibodies, complements and other immune components. Understanding of immune mechanisms in disease control, vaccination, process of immune interactions.

Bioinformatics and Applied Biology

Course Objectives

To make the student familiar with the fundamentals of computer and Bioinformatics. To become familiar with sequence. To impart the knowledge of biotechnology, different applications of biotechnology to mankind.

Course Outcomes

Students gain skills in basics of computers, operating systems, overview of programming languages. Application of internet and statistical bioinformatics in research. Use in recombinant DNA technology, genetic manipulations and in a variety of industrial processes.

Industrial Zoology

Course Objectives

To teach the students both in the classroom and on the field for self-employment in applied branches of Zoology including aquaculture, cattle farming, poultry and meat industry.

Course Outcomes

On completion of the course, students are able to: 1. Understand the concepts of Aquaculture, poultry and cattle industry. 2. Understand the various Indian breeds and their distribution and characteristics. 3. To aware the students about economic importance of these animals.

Semester III

Animal Behaviour

Course Objectives

To understand Animal behaviour and response of animals to different instincts. Various kinds of Animal adaptations

Course Outcomes

Students who successfully complete this course will be able to:

1) Explain the influence of natural selection on behavior.
2) Describe and give examples of reproductive behaviors and mating strategies employed by animals.
3) Explain corporative and competitive behavioural interactions.
4) Define eusociality and explain the costs and benefits of this strategy.

General Endocrinology

Course Objectives

1) To learn basic and advanced endocrine biochemistry, physiology and pathophysiology, which provide the basis for understanding endocrine diseases?
2) To accumulate a critical mass of fundamental information and practical approaches for the diagnosis, management and prevention of endocrine disorders

Course Outcomes

The student will develop an understanding of the role of the endocrine system in maintaining homeostasis and health. The student will be better able to understand the integrative workings of the human body by studying this signaling system.

Instrumentation and Biostats

Course Objectives

Students gain knowledge about various tools & techniques used in biological systems and give them insight about their use in research. Biostatistics teaches them to use the best data analysis methods. Students gain knowledge about statistical methods like measures of central tendencies, Probability. Learns about hypothesis testing and inferential statistics and the problem-solving methods.

Course Outcomes

Students who successfully complete this course will be able to:

1) Choose an appropriate sampling scheme and/or experimental design for a given biological question.
2) Select and apply the appropriate analytical methods to biological data.
3) Demonstrate the necessary skills for biological data management, analysis and graphical presentation.
4) Evaluate critically the primary instrumental requirements observation and experimental biology.

Cell Signalling

Course Objectives

To understand how membrane-bound and nuclear receptors signal. To get deeper knowledge about the functioning and regulation of kinases, GPCRs, nuclear hormone receptors and cytokine receptors. To gain knowledge on the role of cell signaling in development and progression of animals.

Course Outcomes

After studying this course, students should be able to:

1) define and use each of the terms printed in bold in the text
2) understand the basic principles of signal transduction mechanisms, in particular the concepts of response specificity, signal amplitude and duration, signal integration and intracellular location
3) give examples of different types of extracellular signals and receptors, and explain their functional significance
4) describe the mechanisms by which different receptors may be activated by their respective ligands
5) Describe and give examples of the structure and properties of the major components of signal transduction pathways.

Microbiology

Course Objectives

This course is designed to explain the importance of microbial diversity. It describes role of different microorganisms to human.

Course Outcomes

Students who successfully complete this course will be able to:

1) Describe disease-causing microorganisms and microbial agents at organismal, cellular and/or molecular levels.
2) Relate normal cellular and molecular structures to their functions.
3) Explain cellular processes and mechanisms that lead to physiological functions and pathological state.

Semester IV

Zoogeography, Wildlife and its management

Course Objectives

The course is an introduction to wildlife management at the state, national and international level and some of the tools used by wildlife managers. Topics covered include the management of vertebrate pest, wildlife conflict and over abundant species, wildlife health and disease and wildlife utilisation and conservation. In addition to providing a sound scientific and theoretical background on wildlife sciences and management, tutorial activities and a field trip will provide the students with a hands-on experience and practical skills and tools used by wildlife managers.

Course Outcomes

After completing this course, students can Demonstrate knowledge of the main components of wildlife management and be able to give examples. They can describe the main management tools and techniques used by wildlife managers. Students can understand the principle of wildlife health investigation and be competent in collecting biological samples.

Histology and Histochemistry

Course Objectives

To describe the methods of studying cells and tissues, the specific characteristic of cell components in relation to the functions of each component, the scientific basis of tissue preparation. Histochemistry combines the techniques of biochemistry and histology in the study of the chemical constitution of cells and tissues.

Course Outcomes

On completion of the course, students are able to:

1) Understand the terms Histology and Histochemistry.
2) Correlate between histological structure & function of any cell or tissue.
3) Handle the histological glass slides and examine them using the maximum microscopic facilities.
4) Identify various types of stains & micro techniques.

Bio -Techniques

Course Objectives

Understanding of basic concepts of instrumentation, to gain skills in techniques of chromatography, electrophoresis, spectroscopy and radioisotopes, to gain skills in histological, immunological and electrophysiological techniques.

Course Outcomes

Students can learn the basic principles of analyses and detection systems involved in molecular biology techniques, chromatographic, principles of electrophoresis and immunochemical techniques and discuss how these techniques can be used in molecular medicine.

Fish and Fisheries

Course Objectives

Course provides the students comprehensive understanding about aquatic ecosystem and various economical important fishes. It helps in Understanding of embryogenesis - Early development and post embryonic development. Understanding of fish habits and habitats and their functional anatomy.

Course Outcomes

Students gain knowledge in the areas of responses characterization and classification of fishes. Students gain knowledge of integumentary system - basic structure of skin, dermal and epidermal pigments, fins, and scales. The students will be well equipped to become very competent in research or teaching fields

Parasitology

Course Objectives

To study and understand the scope of parasitology. To aware the students for various parasites and diseases which spreads in human with the help of study of host-parasite relationship. To increase awareness for the health in students. To understand the various disease causing vectors like Mosquitoes. To aware about the typhoid, cholera like disease.

Course Outcomes

Students who successfully complete this course will be able to:

1) Explain basics of the parasitic life-mode in context of ecological and evolutionary forces.
2) Apply basic physiological, evolutionary and ecological concepts to parasitic relationships.
3) Identify major parasitic groups, and describe their key characteristics.
4) Describe the impact of parasitic infections on human health and history.
5) Explain medical and public health aspects of human parasitic infections.

Entomology

Course Objectives

To give knowledge of insect identification, morphology, anatomy and physiology through body segments, internal organs and metabolic processes study.

Course Outcomes

Students will learn a complete knowledge about basics of insect body, its morphology, its internal working and biochemical processes for further usage in any form in favour or against the insects.

Research Project

Course Objectives

1) To facilitate Higher education and research in zoology.
2) To provide quality education offering skill based programs and motivate the students for self-employment in applied branches of Zoology.
3) To inculcate the value based education and entrepreneurial skills among the students.

Course Outcomes

1) Achieve excellence in education and scientific research in the field of Zoology.

2) Develop and implement ways and means to ensure quality performance and outputs of the project.
3) Optimal use of modern technology in education and scientific research.
4) Implementation of advanced training to improve the skills of graduates in Zoology and related fields