Aggarwal College Ballabgarh

A Co-educational Post Graduate College Accredited 'A' Grade by NAAC (CGPA 3.40)
College with Potential for Excellence (CPE) Status by UGC
Affiliated to M.D. University, Rohtak

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Course Outcomes (COs), Programme Outcomes (POs) & Programme Specific Outcomes (PSOs) for UG, Hons., and Vocational Programmes

Course Outcomes (COs), Programme Outcomes (POs) as well as Programme Specific Outcomes (PSOs)

Mechanism of Communication:

- The College has well stated Course Outcomes (COs), Programme Outcomes (POs) as well as Programme Specific Outcomes (PSOs) duly recommended from IQAC and approved by Academic Council and there is a structured mechanism to communicate the same to the teachers and students
- Soft Copy of syllabi and Course Outcomes (COs), Programme Outcomes (POs) as well as Programme Specific Outcomes (PSOs) Outcomes is displayed on college website
- Hard copy is available in the departments for ready reference to the teachers and students
- The importance of the Course Outcomes (COs), Programme Outcomes (POs) as well as Programme Specific Outcomes (PSOs) has been communicated to the teachers in various meetings in the college and during IQAC Meetings
- The students are also made aware of the same through Tutorial Meetings and mentor periods.

COURSE OUTCOMES
Name of Programme: B.A.

English

Semester-I
Paper: EN-01 English

CO 1: The course offered in BA 1 aims to shape the delicate minds of the newcomers towards being sensitive, sensible with critical bent of mind and acquiring the basics of language through the book "English Literature and Language I".

CO 2: This course provides an opportunity to the students to improve their pronunciation through an elaborated chapter on speech symbols and sounds. They are then reinforced thorough practice words of their phonetic transcription at the end of all the chapters.

CO 3: Empower the students to improve the vocabulary which in turn helps to improve the comprehension of the students.

CO 4: A brief analysis of the essays in the texts would help the students in comprehending the historical, political, religious, intellectual, scientific, emotional and cultural aspects of one's societal life on the whole.

CO 5: The essays included in the texts help to develop the emotional quotient of the students towards plants, animals and fellow human beings.

Semester-II
Paper: EN-02 English

CO 1: Students get a glimpse of famous writers and authors whose brief bionote is provided at the end of the chapter so as to apprise the students of their life achievements, innovations and discoveries of these eminent persons of letters. They act as role models for these students to emulate.

CO 2: The students get a detailed knowledge and practice into formation and structuring of sentences, voices and various facets of grammar.

CO 3: Stories included in the text help to develop the emotional quotient of the students towards animals and fellow human beings.

CO 4: The inclusion of stories and short narratives in this semester aids the students to navigate through the complexities of life as well as enhance their imagination\

CO 5: The conclusion of this semester will help the beneficiaries to develop oratory and writing skills along with good vocabulary understanding.

Semester-III
Paper: EN-03 English

CO 1: The student demonstrates an increase in awareness of word knowledge, vocabulary, sentence formations, grammatical rules.

CO 2: The poetry enhances the students understanding of various elements of poetry such as tone, diction, genre, figures of speech, symbolism and many more.

CO 3: They are able to demonstrate text structuring and organization of the same into paragraphs.

CO 4: The conclusion of the course enables them to enhance their creative skills and writings in a systematic and refined way as they are expected to write paragraphs on specific topics.

CO 5: They are able to identify main ideas in reading and paraphrase the same systematically.

Semester-IV
Paper: EN-04 English

CO 1: The end of the course will enable the students to interpret, analyze, discuss several plays & reading material with ease.
CO 2: The conclusion of the course will enable the students to incorporate personal experiences that can be used for creative writings.
CO 3: The course also increases their oral as well as reading fluency.
CO 4: They are able to demonstrate text structuring and organization of the same into paragraphs.
CO 5: The end of the course will enable the students to use the grammatical structures, translations from Hindi to English and English to Hindi accurately and systematically in a proper manner.

Semester-V
Paper: EN-05 English

CO1: Raja Rao's novel Kanthapura will help the students to understand the social, political, cultural, historical aspects of Indian freedom movement in 1930s.
CO2: It will provide better understanding of various age-old social evils that still plague the society and need an urgent redressal.
CO3: Dramatic and vivid description of the events depicting real issues at the heart of freedom movement will provide better understanding and also inculcate patriotic feelings and gratitude for the sacrifice and contribution of common man.
CO4: It will familiarize the students with various literary forms.
CO5: It will help students in their critical thinking process and enhance their reading and writing skills.

Semester-VI
Paper: EN-06 English

CO1: William Shakespeare's The Merchant of Venice will familiarize the students with various nuances of plays of Shakespeare.
CO2: It will help them to have better understanding of the text and its themes. It will encourage them to appreciate and understand wider human issues that are still relevant in today's world.
CO3: It will familiarize them with cultural and historical context of the Shakespeare's play.
CO4: It will improve their comprehension and communication skills.
CO5: It will help the students in their critical thinking process and enhance their reading and writing skills.

बी० ए० (हिंदी अनिवार्य)

पाठ्यक्रम परिणाम **(Course outcomes) – COS**

सैमेस्टर – **I**

Paper: HI-01 Hindi

CO1: वद्या र्थयों ने भक्तिकालीन तथा रीतिकालीन क वयों व उनकी रचनाओं, एवं भाषाशैली के बारे मे वस्तार से ज्ञान प्राप्त कया |

CO2: उन्होंने हिंदी साहित्य के इतिहास की काल- वभाजन व लेखन परम्परा को समझा |

CO3: वद्या र्थयों ने हिंदी साहित्य के आरम्भिक काल आदिकाल या वीरगाथा काल के नामकरण, परिस्थितियों प्रवृतियों एवं प्रमुख क वयों व उनकी रचनाओं को भली भाँति समझा |

CO4: वद्या र्थयों ने साहित्य व काव्य की परिभाषा, काव्य-गुण, शब्द-शक्ति, रस, छंद एवं अलंकार की परिभाषा लक्षणों की उदाहरण सहित समझ कर काव्य के व वध अंगो की जानकारी प्राप्त की |

CO5: वद्या र्थयों की साहित्य व काव्य के प्रति रु च जागृत हुई |

सैमेस्टर – **II**

Paper: HI-02 Hindi

CO1: वद्या र्थयों ने नाटक व रंगमंच के तत्वों की जानकारी प्राप्त की |

CO2: ध्रुव स्वा मनी नाटक के माध्यम से लेखक जयशंकर प्रसाद की नाट्य कला की वशेषताओं को समझा |

CO3: हिंदी साहित्य के भक्तिकाल के अंतर्गत सगुण व निर्गुण काव्य की वशेषताओं और प्रमुख क वताओं के वषय में व्यापक जानकारी प्राप्त की |

CO4: वद्या र्थयों ने बोली, भाषा, मानक भाषा, राजभाषा, राष्ट्रभाषा, मातृ - भाषा और माध्यम भाषा के अर्थ को समझा |

CO5: वद्या र्थयों की भाषा के प्रति समझ वक सत हुई |

CO6: नाटक के प्रति वद्या र्थयों की रु च जागृत हुई |

सैमेस्टर – **III**

Paper: HI-03 Hindi

CO1: वद्या र्थयों ने आधुनिक हिंदी क वयों की रचनाएं पढकर उनके भाव, भाषा व शैलीगत वशेषताओं को समझा |

CO2: क वयों को स्मरण कर क वता-पाठ् में रू च उत्पन्न हुई |

CO3: हिंदी साहित्य में रीतिकाल की पृष्ठभू म, वशेषतओं और प्र सद्ध क वयों की जानकारी प्राप्त की |

CO4: वद्या र्थयों ने कम्प्यूटर के स्वरूप व महत्व; ईमेल (प्रेषण -ग्रहण) और इंटरनेट की उपयो गता के वषय में जानकारी प्राप्त की |

CO5: वद्या र्थयों ने मशीनी अनुवाद और अनुवाद के व भन्न प्रकारों व प्र क्रया के बारे में सीखा |

CO6: कम्प्यूटर प्रयोग की क्षमता वक सत हुई एवं सभी वद्या र्थयों ने अपना ई -मेल पता बनाने में वशेष रू च ली |

सैमेस्टर – **IV**

Paper: HI-04 Hindi

CO1: हिंदी साहित्य के प्रमुख कहानीकारों व उनकी प्र सद्ध कहानियों को पढ़कर उनसे नैतिकता व सामाजिक मूल्यों की शक्षा प्राप्त की |

CO2: कथा-वाचन व कहानी-लेखन के माध्यम से रचनात्मक कौशल का वकास हुआ |

CO3: कहानी, उपन्यास, नाटक व निबंध के उद्गम व वकास को स वस्तार समझा |

CO4: वे गद्य-पद्य के अंतर से पर चत हुए |

CO5: वद्यार्थी परिभा षक शब्दावली से परि चत हुए और उनका समु चत प्रयोग सीखा |

CO6: वद्या र्थयों के संप्रेकषण कौशल का वकास हुआ |

सैमेस्टर – **V**

Paper: HI-05 Hindi

CO1: वद्या र्थयों ने समकालीन हिंदी क वयों और उनकी रचनाओं की वस्तृत जानकारी प्राप्त की |

CO2: उन्होंने आधुनिक काल के काव्य के व भन्न क वयों और क वताओं तथा भाव-भाषा-शैली वषयक व्यापक ज्ञान प्राप्त कया |

CO3: काव्य के प्रति रू च वक सत हुई |

CO4: कुछ वद्यार्थी क वता-लेखन में प्रवृत हुए |

CO5: औपचारिक तथा अनौपचारिक पत्र लखना सीखा |

CO6. संक्षेपण और पल्लवन प्र क्रया की जानकारी प्राप्त कर रचनात्मक लेखन में रू च जागृत हुई |

CO7: भाषण व वाद- ववाद की क्षमता का वकास हुआ |

सैमेस्टर – **VI**

Paper: HI-06 Hindi

CO1: वद्या र्थयों ने हिंदी साहित्य की व भन्न व धयों (निबंध , हास्य,व्यंग्य, संस्मरण, यात्रा वृतांत) की जानकारी प्राप्त की |

CO2: हरियाणवी लोक साहित्य के अंतर्गत हरियाणवी सांग , क वता, उपन्यास, कहानी, नाटक, प्रहसन का ज्ञान प्राप्त हुआ |

CO3: हरियाणवी भाषा व व भन्न बो लयों को समझकर हरियाणवी साहित्य के प्रति रू च जागृत हुई |

CO4: पत्रकारिता के अर्थ एवं स्वरूप की जानकारी प्राप्त हुई |

CO5: हिंदी पत्रकारिता के प्रति रुझान जागृत हुआ |

B.A. History

Course Outcomes (COs)

Semester-I

Paper-HR-01 History of India (Earliest Times to 1200AD)

CO 1: The students will identify and describe the emergence of the earliest civilizations in India: the Harappan and Aryan societies in the Indian sub-continent.
CO 2: They will Identify and analyze the Buddhist and Vedic (Hindu) faiths.
CO 3: They would be able to analyze the emergence of the Mauryan and Gupta empires during the "classical age" in India.
CO 4: Will enable students understand the maps of important sites of Harappan Civilization, extent of Ashoka's Empire and Pillars Edicts, Ports, Trade routes of Ancient India, Extent of Kanishka' Empire & Extent of Harshavardhana's Empire

Semester-II

Paper-HR-02 History of India (1200 to 1707 AD)

CO 1: Make students understand the rise and expansion of Delhi Sultanate.
CO 2: They will be able to analyze Mughal rule, administrations, art, and architecture.
CO 3: They will be able to identify cultural synthesis in Delhi Sultanate and Mughal Rule.
CO 4: They can understand the Maps- Urbancenters in Delhi Sultanate, Empire under Allauddin Khilji, Political condition of India during Babar's Invasion, Mughal Empire under Akbar and Aurangzeb.

Semester-III

Paper-HR-03 History of India (1707 to 1947 AD)

CO 1: The students can evaluate consolidation of English Power in India.
CO 2: They can analyze social religious consciousness in British India.
CO 3: They are able to analyze various economic policies in British India
CO 4: The course will enable them to have inter-comparison of Nationalist movements- Pre-Gandhian and Post- Gandhian Era
CO 5: They will be understanding the maps- sites of mutiny of 1857, Centres of socio-religious movements, important places of Revolutionary Movements, Places associated with significant sessions of Indian National Congress.

Semester-IV

Paper-HR-04 History of Haryana (from earliest times to 1947 AD)

CO 1: They are able to have the description of political and cultural activities of Haryana during ancient and medieval period.
CO 2: They will understand and describe early resistance against British East India Company and the mutiny of 1857.
CO 3: They can classify socio- religious movement in Haryana.
CO 4: Students will acquire knowledge about Praja Mandal Movement and Chotu Ram's Unionist Party.
CO 5: The course would enable the students to understand the maps of Haryana- Main centres of Harappan civilization, Haryana at the time of Harshavardhana, Major centres of 1857 Revolt and Main centres of Freedom Struggle in Haryana.

Semester-V

Paper-HR-05 Ancient and Medieval World

CO 1: Upon successful completion of this course, the student will be able to identify and define the world's earliest civilizations, including the Neolithic Revolution, and describe how it shaped the development of these early civilizations.

CO 2: They would be able to identify, describe, and compare/contrast the first advanced civilizations in the world—Mesopotamia and Egypt.

CO 3: They are able to identify and describe the characteristics of the Roman Kingdom, the Roman Republic, and Imperial Rome.

CO 4: They will be able to Identify and analyze key facets of medieval society in Western Europe—the Catholic Church and Feudalism, the rise of Islam in the Middle East, Identify and describe the emergence of the Arab Caliphate, the Umayyad dynasty, and The Abbasid dynasty

.CO 5: They will be capable of understanding the maps of important Sites of Bronze Age Civilization, Main Centers of Greek Civilization, Formation of empire under Abbasids.

Semester-VI

Paper-HR-06 Modern World

CO 1: Students are able to classify growth of mercantilism and capitalism.

CO 2: They can analyze and describe the development of Agricultural and Industrial revolutions.

CO 3: They can analyze the classification development of democracy in England, France, Italy and Germany.

CO 4: They will acquire knowledge about Russian Revolution and Chinese Revolutions.

CO 5: They are able to analyze and describe the emergence and effects of World Wars-I & II.

CO 6: Understand world maps- Area of Agricultural Revolution, Europe on the eve of French Revolution, Unification of Italy and Germany.

B.A. Political Science

Course Outcomes

Semester -1

Paper: PS01 Indian Constitution (option 1)

CO1: In a democratic republic like India students are to be made aware of our constitution and its understanding. The course contains sources of constitution, Fundamental duties and Fundamental rights of citizens which all must know for an healthy democracy.

CO2: Students will learn about levels, roles and responsibilities of the executives for running state and central government effectively. Students will understand the duties and constitutional powers of the President, Prime Minister, Governor, Chief Ministers and the council of Ministers.

CO3: The course explains the composition and role of the Lok Sabha,the Rajya Sabha and the state Legislature and also the working of the Gram Panchayat, the Gram Sabha and the duties of the Sarpanc has the executive; Knowledge about the need and mechanisms of the Constitutional amendments.

CO4: Judiciary as an important pillar of a successful democracy need to be discussed and well understood. The Contents will make students aware of the judiciary levels – the high Courts and the SupremeCourt and the judicial process.

Semester-II

Paper: PS02 Indian Politics (option 1)

CO1: India being a federal state with unitary features, students will learn about Centre –State relations, Principles of healthy federation and also sharing of powers and revenue between centre and the states. Students will learn about justification of more autonomy to the states and pros and cons of smaller states.

CO2: Exercising franchising in transparent manner is necessary for democracy. The Students will know the composition,powers and duties of the Election Commission of India,challenges in smooth conduct of the elections;factors affecting voting behaviour, voters' rights and responsibilities and need for new electoral reforms in India.

CO3: Knowledge about the political parties in India - both the Nationalparties and the popularity of the Regional parties and comparative study of dual party andtheMulti-partysystem.

CO4: Growing factionalism in Indian politics on the basis of region, religion, caste and language and its implication for democracy. Students shall learn the factors for these fissiparous tendencies and counter measures required.

Semester-III

Paper: PS03 Principles of political Science-I (option 1)

CO1: Understanding the meaning,nature and scope of the Political Science for a common citizen in a young democracy;relating the political science with othersocial sciences and the benefits derived in

CO2: Theorigin and existence of the states in democracy, Institutions building and role for smooth governess, the knowledge about theories of evolutionof the state and its governess.

CO3: Nature of state in democracy,Pros and cons of liberal and non-liberaldemocracies. The knowledge about the relevance of the Marxism views in the Capitalist systems.

CO4: Sovereignty - its importance and attributes and its relevance in changing political environment and threats to the sovereignty, comparative study of the Monistic and Pluralistic theories

Semester IV

Paper: PS04 Principles of Political Science-II (option 1)

CO1: Significance and relevance of the knowledge about the Human Rights and its violations in the liberal democracies and its repercussions, therole and powers of the Human Rights Organisations and its importance in democracy.

CO2: Liberal democracy and its benefits,necessity of a democracy which develops inclusive society and all have equal rights to take part.

CO 3: Social changes due to working of democracy and need for Applying Gandhian Model and the concept of the welfare state.

CO4: The evolution of healthy democracy depends on inclusiveness and the non-discriminatory policies. Knowledge about the Right to Information Act and Consumer rights and protection and their importance in democracy

Semester- V

Paper: PS05 Comparative Politics (option 1)

CO1: Need and significance of politics for modern state and comparison of different political systems in the world.

CO2: Knowledge about various approaches of comparative politics and relevance in changing political set up and political equations.
CO 3: Knowledge about basis of constitutionalism and different types of constitution and problems in constitutionalism.
CO4: Inter linkage and interdependence of pillars of democracy –Executive, Legislative and judiciary. The Pressure groups and the Political Parties

Semester VI
Paper: PS06 Comparative constitutions of UK & USA (Option-I)
CO1: Fundamentals and significance of constitutions of the UK &USA in the Indian context and also the socio economic basis in democracies.
CO2: Knowledge about the composition and powers of the executives and the roles of the legislature at different level and its study Vis-a-Vis India.
CO3: The levels and mechanisms of judiciary in UK &USA and their role in keeping democracy transparent and also the role of the pressure groups and political parties.
CO 4: The electoral Process in UK &USA and Its transparency; People attitude towards franchising and consciousness towards politics; the quality and levels of bureaucracy in UK&USA.

B.A. Economics

Course Outcomes
Semester –I
Paper: EC01 Microeconomics-I
CO1: Students will learn the nature and objective of studying Economics and further how consumers behave in the market to get maximum satisfaction through various theories of consumer behaviour.
CO2: Students will be aware about decisions which producers take for maximizing production.
CO3: Making students understand the types and techniques of minimizing cost by the business units
CO4: Students will learn the concepts of revenue and cost and how to achieve break-even point.

Semester-II
Paper: EC02 Microeconomics-II
CO1: Understanding markets classified on the basis of autonomy and power of sellers and buyers and its significance
CO2: Students will learn about pricing decisions, output decisions, advertising decisions, which individual can take to capture the market.
CO3: Students will learn how market can be made consumer friendly.
CO4: Learning the significance of theories of functional distribution viz., profit, rent, interest and wages their distribution and criteria.

Semester-III
Paper: EC03 Macroeconomics-I
CO1: Students will learn about significance and scope of macroeconomics.

CO2: Learning the ancient theory of National income determination where various concepts viz., consumption function, investment function, saving function, govt. expenditure function, tax function
CO3: Learning about national income determination in open economy and its mechanism.
CO4: Understanding how macro stability is achieved through monetary and fiscal policy and its significance

Semester-IV
Paper: EC04 Macroeconomics-II
CO1: Understanding the components of demand and supply of money and how these influences public decisions making
CO2: students will know modern theory where both money and goods market mechanisms helps in achieving macroeconomics stabilities.
CO3: Knowing the benefits and mechanisms of international trade for individual country.
CO4: Students are also made aware of scope of public finance and objectives of taxation and public expenditure for achieving social welfare.

Semester –V
Paper: EC05 Development Economics
CO1: Students will learn about nature of economies in the world and Indian economy particular and what are those factors which decide level of prosperity in the economy.
CO2: Understanding various theories for achieving growth. Students will also learn that how environment and economic growth interrelated and interdependent.
CO3: Learning the causes and types of pollution and need for government intervention to make environment clean.
CO4: Understanding sustainable development which benefits future generation and its measurements

Semester –VI
Paper: EC06 International Economics
CO1: The course explains the need, benefits and reasons of International trade.
CO2: Students will understand that how exchange rate influences, other variables in the economy.
CO3: Understanding the pros and cons of free trade and protection,balance of payment and its stabilities is also explain
CO4: Objectives and functions of international financial institution and regional blocks influences international trade and role and benefits to India.

बी. ए. संस्कृत

कार्यप्रणाली परिणाम
(Course outcome

1 बी. ए प्रथम सत्र ES01 संस्कृत ऐच्छिक

CO 1: सरल वाक्यों के माध्यम से संस्कृत वागव्यवहार कराना।
CO 2: पशु– पक्षियों की कहानियों के माध्यम से सामाजिक, राजनैतिक और व्यवहारिक ज्ञान प्रदान कराना।

CO 3: व्याकरण में सन्धि के द्वारा वर्णों के मेल का ज्ञान कराना।
CO 4: शब्द रुप व धातु रुप द्वारा बौधिक क्षमता का विकसित करना

2 **बी. ए द्वितीय सत्र ES02 संस्कृत ऐच्छिक**
CO 1: दूतवाक्य द्वारा श्री कृष्ण के राजनैतिक ज्ञान एवम् कौशल से विधार्थियों को परिचित कराना।
CO 2: शुकनासोपदेश द्वारा राजधर्म एवं राज्य के कर्तव्य से परिचित कराना।
CO 3: व्याकरण के द्वारा भाषा की शुद्धता का ज्ञान कराना।
CO 4: अनुवाद द्वारा बौधिक क्षमता को बढ़ाना।

3 **बी. ए तृतीय सत्र ES03 संस्कृत ऐच्छिक**
CO 1: सरल वाक्यों के माध्यम से संस्कृत वागव्यवहार कराना।
CO 2: लौकिक साहित्य द्वारा सामाजिक, राजनैतिक और व्यवहारिक ज्ञान प्रदान कराना।
CO 3: सरल माध्यम से रामायण जैसे विशाल महाकाव्य द्वारा ईमानदारी, सत्य, नैतिकता इत्यादि गुणों को विकसित कराना।
CO 4: व्याकरण में प्रत्यय के द्वारा भाषा की शुद्धता का ज्ञान कराना।

4 **बी. ए चतुर्थ सत्र ES04 संस्कृत ऐच्छिक**
CO 1: पुरातन साहित्य द्वारा दिलीप के आदर्श, कर्मनिष्ठता और सत्यता से परिचित कराना।
CO 2: भगवद् गीता जैसे पवित्र ग्रन्थ द्वारा कर्म व उन्नति के लिए प्ररेति करना।
CO 3: व्याकरण में समास के द्वारा संक्षेपीकरण का ज्ञान कराना।
CO 4: पत्र– लेखन द्वारा लेखन क्षमता को विकसित करना

5 **बी. ए पंच सत्र ES05 संस्कृत ऐच्छिक**
CO 1: सरल वाक्यों के माध्यम से संस्कृत वागव्यवहार कराना।
CO 2: वैदिक साहित्य द्वारा भारतीय संस्कृति और पुरातन ज्ञान से परिचित कराना।
CO 3: संस्कृत नाटक के माध्यम से कवि कौशल को उजागर करना।
CO 4: व्याकरण में प्रत्यय के द्वारा भाषा की शुद्धता का ज्ञान कराना।

6 **बी. ए षष्ठ सत्र ES06 संस्कृत ऐच्छिक**
CO 1: सरल वाक्यों के माध्यम से संस्कृत वागव्यवहार कराना।
CO 2: लौकिक साहित्य द्वारा सामाजिक, राजनैतिक और व्यवहारिक ज्ञान प्रदान कराना।
CO 3: संस्कृत नाटक के माध्यम से कवि चातुर्य द्वारा बौधिकता का विकास।
CO 4: निबंध लेखन द्वारा लेखन क्षमता को विकसित करना।

Programme Outcomes (POs) for B.A.

PO 1: The students acquire knowledge in the field of social science, literature and humanities which make them sensitive and sensible enough.
PO 2: The B.A. graduates are acquainted with the social, economic, historical and political traditions and thinking.
PO 3: Programme familiarizes them with the nuances of language which makes them effective communicator.
PO 4: The B.A. Programme enhances the confidence of the graduates through carefully chosen curriculum with emphasis on practical learning, activities and close interaction with teachers & fellow students.
PO 5: This Programme does not restrict the graduates to one specific lane. It empowers them to appear for various competitive examinations or choose the post graduates Programmes of their choice.
PO 6: The B.A. Programme enables the students to acquire the knowledge with human values framing the base to deal with various problems in life with courage and humanity.
PO 7: The students are given exposure to creative environment which sparks their thought process and help to think of the solutions of various issues in life to make this world a better place.
PO 8: Use of ICT helps in providing experiential learning which deeply embeds and has long lasting impact.
PO 9: This Programme prepares them well to explore and avail opportunities available.
PO 10: The Programme lays the foundation to become a responsible citizen and meaningfully contribute to society.

Programme Specific Outcomes (PSOs) for B.A.

PSO 1: The students are enabled to acquire knowledge in the field of social sciences, literature and humanities which make them sensitive and sensible enough.

PSO 2: The B.A. graduates will be acquainted with the social, economical, historical, geographical, political, ideological and philosophical tradition and thinking.
PSO 3: The Programme also would empower the graduates to appear for various competitive examinations or choose the post graduate Programmes of their choice.
PSO 4: The B. A. Programme will; enable the students to acquire the knowledge with human values framing the base to deal with various problems in life with courage and humanity.
PSO 5: The students will be stimulated enough to think and act over for the solution of various problems prevailed in the human life to make this world better than ever.
PSO 6: Programme would provide them the base to be the responsible citizen.

COURSE OUTCOMES
Name of Programme: B.Com. (Pass)

Semester 1

Paper: 1.01 Financial Accounting

CO1: After studying this course, the students should be able to define book keeping and accounting.

CO2: With the help of this course, the students will understand the general purposes and functions of accounting.

CO3: It describes the main elements of financial accounting information - assets , liabilities , revenue and expenses.

CO4: It will impart the practical knowledge of capital and revenue expenditures and income.

Paper: 1.02 Business Mathematics-I

CO1: It helps the students to understand the use of sets in daily life problems.

CO2: The course will help the students in solving complicated arithmetic expressions using log tables.

CO3: The students will acquire the knowledge about the use of Permutation and combination, Arithmetic and Geometric Progression in daily life problems.

CO4: The course comprehends the use of collection and interpretation of data.

Paper: 1.03 Business Economics

CO1: Developing the ability to explain core economic terms, concepts and theories

CO2: Understanding theories and principles in micro economics including market structure, consumer theory. Production theory and cost theory. Apply these principles and theories to analyze economic issues.

CO3: Acquiring the necessary quantitative skills used in economic analyses.

CO4: To make the students learn how micro economics principles are useful in taking business decision for profit maximization and non-profit maximization objective.

Paper: 1.04 Business Management

CO1: To make the students learn how management technique is to be adopted to run the organization effectively by using principle of management.

CO2: Understand the importance of administration and management.

CO3: The students will understand the relation between individuals, groups, departments and between levels of management.

CO4: It describe the students about delegation and decentralization and the details about planning and MBO.

Paper: 1.05 Business Communication

CO1: The course would empower the student to acquire in-depth knowledge of principal of oral and written communication, principal of business communication and develop the skill for developing and delivery effective presentation.

CO2: The course content will cater to the needs of the basic requirement like knowledge of internet, e-mailing etc; and the basic documentation using by an organization like letter, memo, notice, minute, and agenda.

CO3: To make the student aware of effective business writing & research approach and information collections.

CO4: The course comprehends the function of mass communication and effective interpersonal communication .skill that maximize team effectiveness and good time management.

Paper: 1.06 Basics of Computer

CO1: The students will identify and analyze computer hardware, software, and network components.
CO2: It also helps the students how to install, configure, and remove software and hardware.
CO3: The students will understand the use of word-processing, spreadsheet, and presentation software to solve basic information systems problems.
CO4: It helps in identifying different categories of computers.
CO5: Understanding the basic hardware components.

Semester-II

Paper: 2.01 Financial Accounting

CO1: To enhance the further knowledge of students about hire purchase system and installment payment system.
CO2: To give the students practical knowledge about how to prepare branch accounts (including foreign branch) and departmental accounts.
CO3: To tell the students about dissolution of partnership firm including Garner vs. Murray rule, gradual realization and piecemeal distribution.
CO4: To give practical knowledge of joint venture account and royalty account to the students.
CO5: It enables students to understand information contained in the published financial statements of companies and other organizations.

Paper: 2.02 Business Mathematics

CO1: The students will understand the use of Matrices and Determinants to solve simple business problems.
CO2: The students will be able to use differentiation in profit maximization and cost minimization problems.
CO3: Understanding the concept of simple interest, compound interest and annuities in EMI problems.
CO4: The students will acquire the knowledge about the use of ratio, proportion, profit and loss in daily life and business problems.

Paper: 2.03 Business Economics

CO1: The students will be able to define the nature of the market influences, consumers, choices, surplus and welfare. The present course covers to extremes of market- Perfect Competition and Monopoly
CO2: This course will help the students to understand monopolistic competition and oligopoly forms of market, their future and impact of their policies.
CO3: After completing this course, the students will understand how firms control market decisions regarding price, output and profit sharing.
CO4: This course also covers financial distribution of income with form of rent, interest and profit.

Paper: 2.04 Business Management

CO1: The students will learn how to apply conceptual learning skills in today's business environment.

CO2: This course will help the students in gaining knowledge about motivating employees by providing financial and nonfinancial incentives.
CO3: Helps in evaluating the organizational decisions with consideration of the political, legal and ethical aspects of business.
CO4: The students will understand the strengths, weaknesses, opportunities and threats of the business environment.

Paper: 2.05 Business Environment

CO1: Students will be able to define various elements internal as well as external affecting business environment.
CO2: After completing this course, the students will explain the techniques like SWOT Analysis
CO3: The present course will make commerce students capable of understanding dynamics of business.
CO4: This course will help students to understand different types of policies like monetary policy, fiscal policy and industrial policy.

Paper: 2.06 Basics of Computers

CO1: Students will learn to work in different areas like Software and IT industry, Retail Management etc.
CO2: This program will prepare students to undertake careers involving skills and problem solving using programming techniques and technologies .Structure for this program covers most of the foundational aspects of IT Sector and also focus on the software developing skills.
CO3: Students get able to improve communication skills which provide confidence to work in effective as well as efficient manner.
CO4: The students will acquire the knowledge, skills, experience and values to become lifelong learners able to obtain employment in all fields.

Semester-III

Paper: 3.01 Corporate Accounting

CO1: Students will be able to understand the accounting treatment of issue of shares and issue of bonus shares.
CO2: With the help of this course, the students will understand redemption of debentures.
CO3: It endeavors the students about goodwill and its adjustments in the books of a partnership business.
CO4: Students will have the ability to analyze complex issues related to profit or loss before and after incorporation.

Paper: 3.02 Business Statistics

CO1: After studying this course the students will understand the use of data collection and data presentation in an effective manner using diagrams, graphs and tables.
CO2: It helps in describing how to apply different tools on data like averages, partition values, measures of dispersion and moments.
CO3: With the help of this course, the students will understand the concept of correlation and regression for a data of two variables.

Paper: 3.03 Business Regulatory Framework

CO1: Business Regulatory Framework will provide a brief idea about the framework of Indian Business Law. The Indian contract act 1872 and what are the essential provisions.
CO2: After studying this course, this subject student will understand the meaning and the importance of contingent contracts and the consequences of breach of breach of contract and understand the concept of contract of Bailment and pledge.
CO3: Students will have the knowledge of the consumer protection act 1982 and also Memorize difference between contract of guarantee and indemnity. Analysis the rights and duties of pawnor and pawnee under contract of bailment.
CO4: Learning how to pursue the consumer rights under consumer protection act 1982.

Paper: 3.04 Corporate Law

CO1. It endeavors the students to know about company, shares and types of company.
CO2. Students will get knowledge about private company in India and development of India co. act.
CO3. The students will come to know that how prospectus is formed and how it can be scanned.
CO4. After completing this course, the students will be able to know about various sources of borrowings for company and they can use it as investment purpose in future.

Paper: 3.05 Human Resource Management

CO1. Students will be able to learn the qualities of Human Resource Manager.
CO2. It endeavors the students to differentiate between on the job and off the job training.
CO3. Students will be able to analysis the importance of various training methods.
CO4**.** To make the students learn the industries relation and industrial unrest.

Paper: 3.06 Basics of Retailing

CO1: The course enables the learner understand the concept of retail & various function of retail and enable the learner understand the new technology in retail.
CO2: The course assists the student in understanding the evaluating role of internet in retailing and provide opportunity for the student to view the globalization of the retail industry in term of different types nad formats of retailing..
CO3: The course describes how consumer decision process effect retailers and describe how change in operational variable affect all channel members.
CO4: The course will help in developing a retail strategy that appeal to a specific target market, which include location, layout/design merchandise, pricing &promotion and develop the sixth months merchandise plan.

Semester-IV

Paper: 4.01 Corporate Accounting

CO1: After studying this course, the students will gain information about merger and purchase.
CO2: It endeavors the students about liquidation and final accounts of companies.
CO3: To make the students familiarize with corporate accounting procedures and to understand the accounting for banking companies.
CO4: Students will be able to understand the consolidated balance sheet.

Paper: 4.02 Business Statistics

CO1: Students will be able to understand the use of Index numbers and Time Series in simple business problems.
CO2: It helps in understanding the concept of Probability and Theoretical Distributions and their use in daily life.

CO3: To provide information about the simple business problems.

Paper: 4.03 Business Regulatory Framework

CO1: Indian partnership Act 1932 – Students will get knowledge about the concept, rights and liabilities of partner deed.

CO2: Negotiable instrument act 1881 – brief knowledge about promissory note, bill of exchange and cheque, crossing of cheque, types of crossing, dishonor and discharge of negotiable instrument.

CO3: The students will get the brief knowledge about Sales of Goods Act 1930 - Introduction; Formation of contract of sale of Goods; conditions and warranties; Transfer of property or ownership.

CO4: Students will be able to understand about the dissolution of firm: - Modes of dissolution; consequences of dissolution of firm; settlement of accounts after dissolution.

Paper: 4.04 Corporate Law

CO1: Students will be able to know the relation between Law and Economic activity and use it for their career.

CO2: After completing this course, the students will be able to understand about the individual enterprises and legal safeguards of it.

CO3: This course will make the students learn to use legal authority and perform legal analysis in the companies.

CO4: It helps in gaining the knowledge about meetings and its arrangement in a legal way.

Paper: 4.05 Marketing Management

CO1: The course enables the student to understand the place and contribution of marketing to the business enterprise and indentify the major basis of market segmentation & its containing state the role and function of marketing within a range of organization.

CO2: To make aware the students how a consumer behaves differently and understands the product life cycle. Able to understand how a product passed from different stages.

CO3: The course will help in understanding the difference between and trademark and branding…and describe the factors affecting the price objectives.

CO4: The student will know the concept of advertising and how the effect buying habits consumers & to understand different method of sales promotion.

Paper: 4.06 Banking and Banking Law

CO 1: The course demonstrates comprehensive principal of banking laws and its relationship to banks and customer. Describe banking systems how it works.

CO2: The course imparts knowledge about reserve bank of India and its policies, regulations and function.

CO3: The course depicts an awareness of law and practice in banking context. Engage in critical analysis of the practice of banking law from a range of perspectives.

CO4: To making aware the student of negotiable instruments and its feature and organizes information as it relates to the regulation of banking product and services.

Semester-V

Paper: 5.01 Taxation Law

CO1: Students will be able to define provisions of agricultural income and residential status for taxation point of view.

CO2: After completing this course, the students will understand the provisions and procedure of computation of total income under five heads.

CO3: To provide knowledge about clubbing and aggregation of income for tax planning.
CO4: It enables the students to know about the deductions u/s 80C-80U for tax saving in legal way.

Paper: 5.02 Cost Accounting

CO1: The students will understand clearly to reduce and control the cost during the course of production because cost is a vital aspect in the modern business.
CO2: It will provide knowledge about the ascertainment the profitability of each of the products and advise the management to maximize its profits.
CO3: Developing knowledge among students about cost ascertainment and fixation of selling price and cost control.
CO4: Students will learn the knowledge preparation of tenders, quotations, etc.

Paper: 5.03 Accounting for Management

CO1: This course will help the students to understand the nature and purpose of different types of organizations as commercial, voluntary, public sector etc.
CO2: It enables the students how to describe the different ways in which organizations may be structured.
CO3: It helps the students to know about the different types of ration analysis.
CO4: The students will be able to explain the cash flow techniques.

Paper: 5.04 Financial Market Operations

CO1: It enable student to understand the financial market such as money market and capital market, primary market and secondary market and its characteristics.
CO2: It will provide the knowledge about different financial assets such as money market instruments, Commercial paper, certificate of deposit, discount house and bonds etc.
CO3: The course contents will make the students aware the student about functioning of stock exchange and they will also get the knowledge about development banks and financial institution in financial market.
CO4: This course will enable the students to buy and sell securities in stock exchange. It would help them to make good investment.
CO5: This course will familiarize with portfolio and can easily manage their investment risk. They would be able to do work on stock exchange.

Paper: 5.05 Entrepreneurship & Small Scale Business

CO1: Encourage students to consult department advisors concerning career goals and developing study programs consistent with those career goals.
CO 2: Learning how to identify and select business opportunities.
CO 3: It helps the students how to prepare business plans.
CO4: Student will be able to understand the importance and role of ethical, sustainability, innovation and global issues for strategic decision making.

Paper: 5.06 International Trade

CO1: The purpose of this course is to provide students with a thorough grounding in the theory of International Trade as well as International Trade policy and to demonstrate the relevance of the theory in the analysis of existing patterns of International Trade and what determines them.
CO2: Identifying and discussing the key concepts underlying comparative advantage.
CO3: Assessing the role of domestic and International institutions and norms in shaping economies.

CO4: Describing the success and failure of the theories and different International Organizations

Semester-VI

Paper: 6.01Taxation Law

CO1: Students will be able to define the procedure of Direct tax assessment of Individual, HUF and firms.

CO2: It enables the students to understand how to file Income tax return on Individual basis.

CO3: Students will be aware about Income tax authorities and their powers.

CO4: After completing this course, the students will get about penalties, offences, prosecutions and Appeal and revision of tax.

Paper: 6.02 Cost Accounting

CO1: It helps in creating skills about handling of various financial records, documentation, collection and classification of different costs.

CO2: Creating ability to take decision at different level of production activity like make or buy, project launching etc.

CO3: Helpful in determination of profitable or unprofitable activity in business by using different cost accounting tools.

CO4: Getting known with how to publish information about production to management, consumer, Government, Employee at different levels for decision making purpose.

Paper: 6.03Financial Management

CO1: This course will help the students to develop the ability to analyze complicated financial problems.

CO2: It enables the students to work in the field of finance successfully.

CO3: It helps the students to demonstrate ability of financial management and forecast.

CO4: This course will encourage the students to acquire research skills, innovation and course in financial management.

Paper: 6.04 Auditing

CO1: After completing this course, the students will be able to understand why external audits and other types of audit services are conducted.

CO2: It helps in acquiring the knowledge about the duties of auditors and procedure of auditing.

CO3: Students will get the knowledge about the Audit of Public Company.

CO4: To providing the definition of the internal control system, control activity, to provide on how the financial reporting assertions are related to internal controls, and how the effectiveness of internal controls is assessed.

Paper: 6.05 Goods and Services Tax & Customs Law

CO1: This course will help the students to know about the constitutional framework of Indirect Taxes before GST (Taxation Powers of Union & State Government. Major Defects in the structure of Indirect Taxes prior to GST; Rationale for GST; Structure of GST (SGST, CGST& IGST) Levy and collection of GST Taxable event.

CO2: It enables the students to gain knowledge about the "Supply" of Goods and Services; Place of Supply: Within state, Interstate, Import and Export; Time of supply; Valuation for GST- Valuation rules, taxability of reimbursement of expenses; Levy and collection of GST Taxable event- "Supply" of Goods and Services.

CO3: Place of Supply: Within state, Interstate, Import and Export; Time of supply; Valuation for GST- Valuation rules, taxability of reimbursement of expenses

CO4: This course will encourage the students to acquire the information about the Input Tax Credit Eligible and Ineligible Input Tax Credit; Apportionments of Credit and Blocked Credits; Tax Credit in respect of Capital Goods; Recovery of Excess Tax Credit; Availability of Tax Credit in special circumstances.

Paper: 6.06 International Marketing

CO1: After completing this course, the students will be able to understand the product designing and packaging; Pricing process and methods; International price quotations and payment terms.

CO2: It helps in acquiring the knowledge about the Domestic Vs International Marketing; Opportunities and Challenges for marketing in International Environment

CO3: Students will be able to understand the basic export procedure and documentation.

CO4: To providing the definition of the International advertising and media strategy, Web marketing, organizing trade fairs and exhibitions.

Programme Outcomes (POs) for B.Com.

After completing 3 years for Bachelor in Commerce Programme, students would gain a thorough grounding in the fundamentals of Commerce and Finance and the outcome will be

PO1: Building a strong foundation of knowledge in different areas of Commerce.

PO2: Developing the skill of applying concepts and techniques used in Commerce

PO3: Inculcating an attitude for working effectively and efficiently in a business environment

PO4: Integrating knowledge, skill and attitude that will sustain an environment of learning and creativity among the students

PO5: Enabling graduates to be capable of making decisions at personal and professional level

PO6: Making them capable of managing the office activities with the help of information technology

PO7: Preparing them understanding the impact of the various accounting procedures and solutions in societal and business-environment contexts, and their sustainable development

Programme Specific Outcomes (PSOs) for B.Com.

PSO 1: Commerce Graduates will be able to pursue chartered accountancy after graduation and may become a public or private certified auditor.

PSO 2: Company secretary course after B Com may help a student to become legal advisor of companies.

PSO 3: Students may opt for a career as financial planner and stock broker after doing some short term courses.

PSO 4: Commerce graduates may become a certified TRP (Tax Return Preparer)

PSO 5: Commerce graduates can opt for Insurance Actuary course which will help them to get high profile jobs.

PSO 6: Commerce Graduates may become expert marketing professional for insurance, banking and other products.

COURSE OUTCOMES
Name of Programme: B.Sc. (Non- Medical)
Mathematics

Semester-I

Paper Code: 12BSM 111 Algebra

CO 1: Algebra provides the foundation for high school mathematics, critical thinking and problem solving, Algebra helps students transfer their mathematical knowledge to more algebraic generalizations.

CO 2: Students will solve problems using equations, graphs and tables to investigate linear relationships. Technology will be used to introduce and expand upon the areas of study listed above.

CO 3: Students will learn how to find roots of quadratic, biquadrate and cubic equations.

Paper Code: 12BSM 112 Calculus

CO 1: learn the general concept of function and its applications to real-world situations and work with exponential, logarithmic and trigonometric function and their applications in applied problems.

CO 2: learn the concepts of the derivative and its underlying concepts such as limits and continuity and to calculate derivative for various type of functions suing definition and rules.

CO 3: learn the various concept of derivative to completely analyze graph of a function. And learn about various applications of the derivative in applied problems.

CO 4: learn about anti-derivative and the Fundamental Theorem of Calculus and its applications and to use concept of integration to evaluate geometric area and solve other applied problems.

Paper Code: 12BSM 113 Solid Geometry

CO 1: The study of the surface and solids in space, especially cones, cylinders prisms, pyramids, polyhedral, and spheres. Solid Geometry also includes the study of points, lines, shapes and regions in relation to solids and surfaces.

CO 2: In this we identify, describe, compare and classify different geometric solids and visualize and represent geometric figures with special attention to spatial relationship.

CO 3: Deduce properties of, and relationship between figures from a given assumptions. Understand and apply geometric properties and relationships. Develop an appreciate of geometry and means of describing physical world.

Semester-II

Paper Code: 12BSM 121 Number Theory and Trigonometry

CO 1: The main application of Number Theory is to protect data into from being transmitted electronically. Most of the modern cryptosystems rely on Number Theory.

CO 2: Number Theory involves study of Euclidean algorithm, highest common factor, prime numbers, prime factors action, partiality testing, congruence, Fermat's little theorem, Quadratic residues.

CO 3: The basic involves analyzing the algebraic structure & graph of trigonometry and inverse trigonometry functions to determine intercepts, domain, range, intervals on which the function is increasing decreasing or constant.

CO 4: To check the symmetry of graph, to fixed asymptotes, to check whether function is one to once etc. Identify & express the conics in standard rectangular form, graph of conics& solve applied problems involving conics.

Paper Code: 12BSM 122 Ordinary Differential Equations

CO 1: Show an awareness of initial and boundary conditions to obtain particular values of constants in the general solution of second-order differential equations.

CO 2: Identify a general method for constructing solutions to inhomogeneous linear constant-coefficient second-order equations.

CO 3: Recognize the proper technique and solve initial value problem for first order equations. Solving of initial value problems for higher order linear homogeneous and non homogeneous equations

Paper Code: 12BSM 123 Vector Calculus

CO 1: Vector Calculus helps us to understand how to mathematically describe physical & abstract quantities that have both magnitude & direction, increases knowledge of properties of functions whose domain consists of real no's & range consists of vectors including differential & integration.

CO 2: Students will be able to find length of a vector, the unit vector i direction of a given vector & the cosine of the angle between two vectors in 3-space.

CO 3: Calculate scalar product, vector product of two vectors & scalar triple product of three vectors; write vector equation & symmetric equation for a line & vector equation & scalar equation of a plane.

Semester-III

Paper Code: 12BSM 231 Advanced Calculus

CO 1: The students are expected to learn about the basic principles of multi variable calculus with proof. Advanced Calculus is a bridge between Calculus and more advanced real analysis.

CO 2: Student will learn Completeness axiom, Archimedean property, Triangle inequality, Convergence of sequence, Sum product and Quotient of convergence sequence.

CO 3: Monotonic sequence, Bolzano Weierstrass Theorem, Monotone convergence Theorem, Uniform continuity on a closed and bounded interval, limits of function, Derivative of polynomial, Derivative of inverse function, Chain rule, Mean value theorem, Rolle's theorem.

Paper Code: 12BSM 232 Partial Differential Equations

CO 1: PDE describes relations between continuously changing quantities which depends on two or more variables. The main goal of this course is that student should be able to solve Boundary value problem for Laplace equation, Heat equation, wave equation by separation of variables in Cartesian, polar spherical & cylindrical coordinates.

CO 2: Students will be able to expand one variable function in series along basis of orthogonal function, for example Fourier series, Bessel's series, Legendre's series.

CO 3: They will be able to find weight function, Eigen values and Orthogonal function system (Eigen function for a given strum-Liouville problem and used the Fourier and Laplace Transform as part of solving a Boundary Value Problem.

Paper Code: 12BSM 233 Statics

CO 1: Student will be able to demonstrate the application of vectors for the analysis of statics equilibrium and analyze different structural elements like trusses, frames and beams.

CO 2: Demonstrate understanding of principle of kinematics and kinetics of particles and planar rigid body and identify techniques for measurement using instrumentation with recognition of the principle of data collections.

CO 3: Students learn to apply the principles of work and energy as well as impulse and momentum and practical's.

Semester-IV

Paper Code: 12BSM 241 Sequences and Series

CO 1: This course involves the study of real and complex numbers, and their properties, particularly completeness, define and study limits of sequences, convergence of series and power series.

CO 2: Students will have detailed understanding of how Cauchy's criteria for the convergence of real and complex sequences and series follow from the completeness axiom of real numbers.

CO 3: Students will develop an understanding of how the elementary functions can be defined by power series, with an ability to deduce some of their easier property, knowledge of simple technique for testing the convergence of sequence and series and students will gain confidence in applying theorems.

Paper Code: 12BSM 242 Special Functions and Integral transforms

CO 1: To make student understand the basic concepts of complex variables and special functions and to make them able to understand mathematical concepts that provide a foundation for the mathematics.

CO 2: Students will be able to demonstrate a sound understanding of elementary functions, analytically Cauchy Riemann equations.

CO 3: Students will learn special functions such as Gamma and Beta functions, Bessel's function and Legendre polynomial, Power series solution of ordinary differential equations.

CO 4: Understanding D'Alembert's solutions of Wave equation and separation of variables of Heat equation, Laplace equation in different coordinate system.

Paper Code: 12BSM 243 Programming in C and Numerical Methods

CO 1: To provide suitable and effective methods called Numerical Methods, for obtaining approximate representative numerical results of the problems. To solve problems in the field of Applied Mathematics, Theoretical Physics and Engineering this requires computing of numerical results using certain raw data

CO 2: To solve complex mathematical problems using only simple arithmetic operations. The approach involves formulation of mathematical models of physical situations that can be solved with arithmetic operations

CO 3: To deal with various topics like finding roots of equations, solving systems of linear algebraic equations, interpolation and regression analysis, numerical integration & differentiation, solution of differential equation, boundary value problems, solution of matrix problems.

Semester-V

Paper Code: 12BSM 351 Real Analysis

CO 1: Student will be able to define and recognize the basic properties of real numbers and improve an outline logical thinking.

CO 2: They will be able to define and understand the series of real numbers and their convergence. Students will be able to use the Bolzano Weistrass Theorem.

CO 3: Recognition and knowledge of basic topological properties of real numbers. Understanding of real functions and its limits.

CO 4: Understanding of continuity of real functions and differentiability of real functions with its related theorems.

Paper Code: 12BSM 352 Groups and Rings

CO 1: Students will be able to learn the meaning and properties of Groups, Subgroups, Lagrange's theorem, Cauchy's theorem, Cyclic Groups.

CO 2: Students will have understanding of Cosets, Quotient groups, Homomorphisms, Isomorphism, Automorphism, inner automorphism of cyclic groups, Cayleys theorem, centre of a group and derived subgroup of a group.

CO 3: Recognition of Rings, Sub rings, Integral domain and fields, characteristics of a ring, ring of homomorphism, ideals and quotient rings.

CO 4: Understanding Euclidean rings, Polynomial rings, Polynomial over rational field, Eisenstein's criteria.

Paper Code: 12BSM 363 Numerical Analysis

CO 1: Application of numerical methods (such as Bisection, False position, Newton-Raphson) to solve nonlinear equations. Computation of the errors and the rates of convergence

CO 2: Recognize Iterative methods (Jacobi –Gauss Seidel). Analyze the Finite difference-Forward and backward difference table. Construct numerical methods to solve ordinary differential equations

CO 3: Apply the Interpolation methods (Newton forward and backward difference interpolation formula-Lagrange interpolation formula) for solving the problems numerically.

CO 4: The student should be shown the ability of working independently and with groups.

Semester-VI

Paper Code: 12BSM 361 Real and Complex Analysis

CO 1: Develop an in-depth mathematical understanding of the theory of calculus. Read mathematical results and proofs as well as formulate her own proofs to various problems.

CO 2: Use and explain the importance of the axioms of real numbers the definition of convergent and divergent sequences the definition of the limit of a function at a point the definition of continuity the definition of the derivative the definition of the Riemann integral.

CO 3: Perform basic mathematical operations (arithmetic, powers, roots) with complex numbers in Cartesian and polar forms. Determine continuity/differentiability/analyticity of a function and find the derivative of a function. Work with functions (polynomials, reciprocals, exponential, trigonometric, hyperbolic, etc) of single complex variable and describe mappings in the complex plane.

Paper Code: 12BSM 362 Linear Algebra

CO 1: To understand model and systematically solve systems of linear equations using matrix notation. Demonstrate factual knowledge of the fundamental concepts of spanning, linear independence, and linear transformations

CO 2: Use of matrix algebra to analyze and solve equations arising in many applications that require a background in linear algebra. Utilize vector space terminology and describe how closely other vector spaces resemble R^n

CO 3: Dissect the action of a linear transformation into elements that are easily visualized using the basic concepts of eigenvectors and eigen values.

Paper Code: 12BSM 353 Dynamics

CO 1: Students will be able to draw the free-body diagram for a particle or for a rigid body in plane motion. Students will be able to understand the basic concepts of force, mass and acceleration, of work and energy, and of impulse and momentum.

CO 2: Students will be able to apply these three basic methods and to understand their respective advantages. Students will be able to explain the geometry of the motion of particles and plane motion of rigid bodies.

CO 3: Students learn to apply the principles of static equilibrium to particles and rigid bodies. Students learn to analyze truss and frame structures. Students apply the principles of equilibrium for analyzing beams. Students analyze problems involving frictional forces. Students learn to draw shear force and bending moment diagram

CO 4: Students analyze planar rigid body kinematics and kinetics. Students learn to write technical laboratory reports. Students apply measurement techniques and formulate experiments based on laboratory handouts.

B.Sc.(N.M.) Physics

Semester-I

Paper: Mechanics (Phy-101)

CO 1: This course helps student to understand the basic and fundamental concepts of classical mechanics.

CO 2: This course helps students to have a deep understanding of Newton's laws and get the knowledge about forces which help them in their daily life.The velocity and acceleration parameters give the knowledge about how the vehicles move.

CO 3: This course helps students to understand the rolling concept and concept of inertia which helps them in their daily life.

CO 4: This course helps students to understand the concept of Lagrangian which further helps them to solve problems related to simple physical systems.

Paper: Electricity and Magnetism (Phy 102)

CO 1: Students would be able to apply a wonderful mathematical del operator on scalar and vector physical quantities to develop the quantities as mentioned in course objectives and also would be able to build up logical and analytical skill to work on new complex physical world by applying the same del operator on the physical quantities of their own choice.

CO 2: Would be able to understand the effect of a charged particle/body in the form of electrostatic and electrodynamics fields.

CO 3: Would be able to visualise the invisible world of accelerated charged particle in the form of electromagnetic field or electromagnetic waves which has socio anthropological

settings across the world by connecting every human being through communication as outcome of electromagnetic waves.

CO 4: Would be able to meet the course objectives in all respects by orienting teaching and other academic processes adopted by the faculty to facilitate the students to do what they are expected to do.

Paper: Physics Practical (PHY – 103)

CO 1: The set of experiments is framed so as to understand the meaning of minute observations and measurements. These experiments are first lesson to the learners that how imperative is the role of measurement in the practical world.

CO 2: All the experiments are based on the theory course of the students in the same year. Therefore these laboratory experiments are ingredient part of the curriculum and helps in comprehensive learning to the students.

CO 3: Experiments based on moment of inertia provide a technical hand to the students and opens a pathway to the industrial world related to machinery and vehicles.

CO 4: Experiments related to the measurement of acceleration due to gravity and elastic constants would put up a clear picture of universal constants to the mind of students. Therefore besides increasing the conceptual clarity, these experiments would further raise the imagination power of the learner.

Semester-II

Paper: Properties of Matters, Kinetic Theory and Relativity (PHY - 201)

CO 1: The Students are able to understand the fundamental concepts related to Hook's law and elastic properties of materials that have many useful applications in daily life.

CO 2: Proper understanding of bending of beam phenomena, cantilever as well as the concept of twisting couple could open up industrial doors to the students.

CO 3: The concepts of energy distribution, specific heats and Maxwell laws of distribution have interesting statistical and experimental verifications. It helps students to closely realize the theoretical part of the curriculum.

CO 4: Theory of relativity is most interesting part of the entire mechanics. It initiates the idea of time machine besides giving origin to many revolutionary concepts.

Paper: Electromagnetic Induction and Electronic Devices (Phy-202)

CO 1: Students would be able to apply and check the results theoretically and experimentally when passive elements are connected to Alternating and Constant source of electromotive force (emf)

CO 2: Would be able to understand the role of a semiconductor elements in controlling the applied source of voltage and current and how these elements have brought up a big change after the discovery of transistor as a semiconductor device.

CO 3: Would be able to see the effect of positive feedback in generating the oscillations without any prerequisite input and the effect of negative feedback in generating the amplification of input signal as this law of physics is explicitly a consequence of law of nature.

CO 4: would be able to meet the course objectives in all respects by orienting teaching and other academic processes adopted by the faculty to facilitate the students to do what they are expected to do.

Paper: Physics Practical (PHY–203)

CO 1: The experiments of this course are framed so as to understand comprehensively the meaning of minute observations and measurements. These experiments are primary lesson to the learners that how essential is the role of measurement in the practical world.

CO 2: These experiments have foundation in the theory course of the students in the same year. Therefore, these laboratory experiments are elemental part of the curriculum and helps in improving the widespread knowledge to the students.

CO 3: Experiments based on special type of diode provide scientific temperament and an industrial hand to the students and opens a pathway to the manufacturing world related to machinery and vehicles.

CO 4: The students by performing the experiments based on current and electricity, learner could realize the many theoretical concepts solenoid, magnetism, frequency of A.C. mains. These experiments provide answer to many queries of the students which is the part of their thoughts so far.

Semester-III

Paper: Computer Programming and Thermodynamics (Phy-301)

CO 1: This course will help to understand the concept of heat and its conversion from one form to another. Thermodynamics can be used in our daily life Laws of thermodynamics are used in refrigerators, air-conditioners, heat pumps etc.

CO 2: One of the important fields of thermodynamics is heat transfer, which relates to transfer of heat between two media. The concept of heat transfer is used in wide range of devices like heat exchangers, evaporators, condensers, radiators, coolers, heaters, etc.

CO 3: The laws of thermodynamics dictate energy behavior, for example, how and why heat, which is a form of energy, transfers between different objects.

CO 4: The Maxwell relations allow us to relate changes in one set of thermodynamic variable to other variables.

CO 5: Programming is important to create software and applications that help computer and mobile users in daily life. Due to all these reasons, it's really important to learn how to use programming languages in our daily life.

CO 6: Programming is important to automate, collect, manage, calculate, analyze processing of data and information accurately.

Paper: Optics – I (Phy-302)

CO 1: The Students are able to understand and correlate various optical phenomena related to light with practical problems/applications in day-to-day life.

CO 2: Analytical treatment of Fourier analysis would establish a bridge that link mathematical equations with their physical aspects and comprehensive recognition with conceptual clarity.

CO 3: A different dimension of laws of reflection, refraction and other equations based on them is shown in Matrix methods. These methods results in simplification/alternate of complicated and lengthy equations studied in twelfth class.

CO 4: Wave nature of light is described by interference of light and it answers many observations in our daily life. For e.g. : coloration in the soap bubble, fringe patterns observed somewhere and laser phenomena based on coherence of light. Thus, students are able to observe and analyze various naturally occurring phenomena.

Paper: Physics Practical (PHY–303)

CO 1: The experiments of the Optics branch would assist students to understand and verify the various laws related to the light and optical event which is just a part of theory for them till now.

CO 2: By performing the experiments based on current and electricity, learner could realize the many theoretical concepts solenoid, magnetism, frequency of A.C. mains. These experiments provide answer to many queries of the students which is the part of their thoughts so far.

CO 3: Use and handling of the sophisticated instruments of the optical phenomena such as telescope and microscope would provide make learner an expert in the field on measurements.

CO 4: Besides realizing the fundamental concepts of theory, the laboratory experiments could provide learner a potential to be absorbed in the industrial world.

Semester-IV

Paper: Statistical Mechanics (Phy-401)

CO 1: This course helps the students to understand the methods of statistical mechanics used to develop the statistics for Bose-Einstein, Fermi-Dirac and photon gases.

CO 2: This course helps the students to understand the concept of microstates and macrostates and how the particles are distributed in the system in different states.

CO 3: This course helps the students to understand the macroscopic and microscopic description of temperature, entropy and free energy and their descriptions in terms of probabilities.

CO 4: This course helps the students to understand the concept of canonical and micro-canonical ensemble.

Paper: Optics - II (Phy- 402)

CO 1: The description of wave nature of light by interference of light answers many observations in our daily life. For e.g. : coloration in the soap bubble, fringe patterns observed somewhere and laser phenomena based on coherence of light. Thus, students are able to observe and analyze various naturally occurring phenomena.

CO 2: The concept of polarization would comprehensively describe the bifurcation between longitudinal and transverse waves. Along with it, students can learn the practical aspect to distinguish between polarized and unpolarized light.

CO 3: The Students are able to understand and correlate various optical phenomena related to light with practical problems/applications in day-to-day life. For e.g. - the distinction between various type of light and different set of polarimeters.

Paper: Physics Practical (Phy–403)

CO 1: To make use of and handling of the sophisticated optical instruments such as Bi -prism arrangement, telescope and microscope would provide learner an expertise in the field of measurements.

CO 2: The experiments of the Optics division would assist students to recognize and verify the various laws related to the light and optical event which is just a part of their imagination till now.

CO 3: In addition to realize the fundamental concepts of theory, the laboratory experiments could make available learner a potential candidate to be absorbed in the industrial world.

CO 4: The computer programming would help students to get familiar with software skills. It not only develops a skill in the students but also opens up another way to the students after completing their graduation course.

Semester-V

Paper: Solid State Physics (Phy-501)

CO 1: This course (solid state physics) gives an extended knowledge of the principles and techniques of solid state physics. The course covers the physical understanding of matter from an atomic view point.

CO 2: It helps us in determining the structures by diffraction (X-rays method)

CO 3: This helps in determining the mechanical strength of materials, how they interact with light, how they conduct electricity, etc.

CO 4: Graduates may pursue careers in applied research or education and work in a variety of industries such as aerospace, engineering and in government laboratories.

Paper: Quantum Mechanics (Phy-502)

CO 1: This course helps student to understand the basic and fundamental concepts of quantum mechanics in terms of its evolution and its applications

CO 2: It helps student to differentiate between the two states of electrons i.e. free and bound and the outcome when a radiation of suitable wavelength falls on it

CO 3: It also throws light on the co-existence of particle and wave nature of matter particles and their applications in photoelectric effect and Compton effect (particle nature) and interference, diffraction, polarisation (wave nature)

CO 4: It also explains the meaning of uncertainty in Physics and how it can be applied to explain various phenomenon of nuclear physics i.e. existence of protons and neutrons and non-existence of electrons in nucleus, how to find the radius of Hydrogen atom

CO 5: This course also explains the behaviour of a free and bound particle in terms of Schrodinger equation and explains the role of potential by way of its applications such as potential barrier, particle in a box. It makes student to understand the concept ot tunnelling, reflection and transmission probabilities at different energies of the particle.

Paper: Physics Practical Paper (Phy-503)

CO 1: This course helps students in gaining practical knowledge of CB, CE amplifiers & in determining their various parameters. It also helps in gaining knowledge of Hartley Oscillator.

CO 2: This course helps students to gain practical knowledge of FORTRAN programming.

CO 3: This course helps students in gaining practical knowledge of resolving power of prism & plane transmission grating & in determining their various parameters. It also helps in gaining knowledge of Rydberg constant.

Semester-VI

Paper: Atomic, Molecular & Laser Physics (601)

CO 1: After studying this course students are able to analysis different spectrums of alkali atoms.

CO 2: The effect of electric and magnetic fields on alkali atoms spectrums is also analyzed and studied.

CO 3: Students are also able to analyze the Raman Effect which gives insight into irrational and rotational energies.

CO 4: The students get in-depth knowledge of He-Ne and RUBY laser, different type of coherence. They can design simple lasers after studying this course.

Paper: Nuclear Physics (PHY-602)

CO 1: Nuclear Physics is a wonderful course having a great relevance to current scenario in terms of research, be it the material science or nuclear science or polymer or nuclear energy etc. all around the world, because this course helps students to have a deep understanding of basic and fundamental concepts of nucleus in terms of its composition (i.e. mass, charge and size), its stability (i.e. binding energy) and various properties (nuclear spin, parity, magnetic and electric dipole moment etc.) and various nuclear reactions.

CO 2: This course enables the students to study the various experimental methods for the acceleration of charged particles (LINAC, Cyclotron, Betatron, etc.), interaction of charged particles (such as Alpha and Beta particles) and Gamma radiations with matter and their detection (G.M. Counter, semi-conductor detector, etc.) and understand the energy loss mechanism of various particles which is most useful when the student goes for higher studies and opt for research.

CO 3: It also helps student to understand the concept of energy emission during a nuclear chain reaction (fission or fusion reaction) and the management of this energy for either the useful purpose (i.e. nuclear reactors) or the destructive purpose (i.e. nuclear bomb).

Paper: Physics Practical (PHY-603)

CO 1: The computer programming would help students to get familiar with software skills. It not only develops a skill in the students but also opens up another way to the students after completing their graduation course.

CO 2: The experiments of electricity such as Transistor, Amplifier, Oscillator would assist students to recognize and verify the various laws related to the electricity which is just a part of their imagination till now.

CO 3: To make use of and handling of the sophisticated optical instruments such as G M Counter would provide learner an expertise in the field of measurements.

CO 4: In addition to realize the fundamental concepts of theory, the laboratory experiments could make available learner a potential candidate to be absorbed in the industrial world.

B.Sc.(N.M.) CHEMISTRY

Semester-I

Paper: CH-101 (Inorganic Chemistry Theory)

Inorganic Chemistry is the branch of chemistry that deals with the synthesis and behavior of inorganic and organ metallic compounds. This diverse field covers all the extensive chemical compounds except the myriad organic i.e. carbon based compounds, usually containing C-H bonds. The branch has amplified applications in every aspect of the chemical industry, including catalysis, materials science, pigments, surfactants, coatings, medications, fuels, and agriculture. It helps in laying the foundations of fundamental chemistry. From this course the students will

CO 1: Have a deep understanding of the structure of atom and the particles constituting it.

CO 2: Will be familiar with the periodic table in which how different elements are placed according to their unique properties.

CO 3: Understand the concept of bonding and how the theories of bonding govern the structures of different compounds. Further on the basis of basic information will develop skills to analyse compounds in unknown compounds.
CO 4: Draw structure of ionic solids and understand its properties.

Paper: CH-102 (Physical Chemistry Theory)

Physical Chemistry deals with the study of macroscopic, atomic, subatomic and particulate phenomena in chemical systems in relation of the principles, practices, and concepts of physics like motion, energy, force, time, thermodynamics, quantum chemistry, statistical mechanics, analytical dynamics and chemical equilibrium. Upon the successful completion of this course, the students will be able to:

CO 1: Differentiate between the states of matter based on the interactions existing amongst their particulates.
CO 2: Understand the simultaneous relationship between pressure, temperature and volume persuading amongst different states of matter.
CO 3: Inculcate the numerical ability.
CO 4: Amalgamate the theoretical knowledge into the practical world by understanding the basic concepts of matter.
CO 5: Learn why different substances display a characteristic melting or boiling points.

Paper: CH-103 (Organic Chemistry Theory)

Organic chemistry is the scientific study of structure, properties, and reactions of organic compounds and organic materials (materials that contain carbon atoms). By the end of this course, students will:

CO 1: Understand the different kinds of bonds existing in organic compounds.
CO 2: Learn how to name different compounds according to IUPAC nomenclature.
CO 3: Be able to visualize the 3D-structures of organic compounds.
CO 4: Recognize and draw constitutional isomers, stereoisomers, including enantiomers and diasteromers, racemic mixture and meso compounds.
CO 5: Perceive different kind of reactions occurring amongst the organic compounds.
CO 6: Be able to differentiate between reactant and reagents.
CO 7: Be able to differentiate between cyclic and acyclic compounds and study their specific reactions.

Paper: CH-104 (Practical)

This course deals with the practical aspects of physical and inorganic chemistry. From this course, students will be benefitted in the following ways:

CO 1: Will be able to apply the theoretical concepts while performing experiments.
CO 2: Will be able to design, carry out, record and analyze the results of chemical experiments.
CO 3: Will be able to titrate different mixtures.
CO 4: Will acquire the habit of working safely with the chemicals and handling of equipments.
CO 5: Will learn, how to make solutions of different concentrations generalizing the concept of normality, molarity and molality.
CO 6: Design experiments that can be applied in everyday life based on the parameters of viscosity, surface tension and specific refractivity.
CO 7: Learn the basics of precipitation.
CO 8: Acknowledge experimental errors and their possible sources.
CO 9: Learn statistical approach for evaluating data.

Semester-II

Paper: CH-201 (Inorganic Chemistry-Theory)

This course deals with the advance knowledge of inorganic chemistry, in which the applications of fundamental inorganic chemistry will be seen. The course will benefit the students in the following ways:

CO 1: Knowledge enhancement to understand the geometry of molecules.
CO 2: Understanding of the classification of periodic table.
CO 3: Recognition of various factors on which the elements are categorized in the periodic table.
CO 4: Analysis of the formation and structure of various compounds by varying the chemical composition thereby enhancing their skillfull growth.

Paper: CH-202 (Physical Chemistry Theory)

This course of physical chemistry is inclined towards kinetics and electrochemistry, in which the topics are gradually divided on the basis of complexity. With this course students will be able to:

CO 1: Understand that every reaction has a unique time of occurrence due to the involvement of different chemical species and with effect of various parameters under observation.
CO 2: Apply the kinetic concept in the interdisciplinary field of science and also in the real world.
CO 3: Relate to the concept about half-life.
CO 4: Enhance their numerical ability by solving numerical from different parameters of these two branches.
CO 5: Differentiate between conductance and resistance and how both the terms are related to each other.
CO 6: Correlate the factors of acidity and basicity with pH and pKa and apply this knowledge with daily edible products.
CO 7: Realize the importance of buffer solutions and which all buffer solutions are used by them on daily basis.

Paper: CH-203 (Organic Chemistry Theory)

This course of organic chemistry nurtures more than the introduction of organic compounds. Following outcomes are expected from this course:

CO 1: Students will be able to analyse the route of formation of certain products.
CO 2: Students will be able to differentiate between the aromatic, antiaromatic and non aromatic compounds and how Huckel rules govern the phenomenon of aromaticity amongst different organic compounds.
CO 3: Students will be able to clearly access the basic difference between alkyl and aryl compounds.
CO 4: Students will be able to relate the concept of stability of compounds with the phenomenon of conjugation and conditions necessary for a system to be a conjugating system.
CO 5: Students will be able to clearly identify the role of hybridization and how the physical and chemical reactivity of these compounds are affected because of different hybridization.

Paper: CH-204 (Practicals)

Students will be able to:

CO 1: Design, carry out, record and analyze the results of chemical experiments.

CO 2: Understand the principle and applications of chromatography.
CO 3: Skillfully perform synthesis of organic compounds.
CO 4: Perform different methods and learn the importance of purification.

Semester-III

Paper: CH-301 (Inorganic Chemistry Theory)

CO 1: Students will have the ability to demonstrate knowledge and understanding of essential facts, concepts and principles of inorganic chemistry.
CO 1: Students will be able to relate the basic difference amongst transition metals. Metal complexes itself covers a broad expect of chemistry and has a wide applicability in quantification of analysis and metal extraction.
CO 2: Students will have an insight idea of spectral properties of different inorganic compounds based on their electronic properties.
CO 3: Students will be able to understand the urge of development of co-ordination chemistry and its integration with d- block elements.
CO 4: Students will be able to relate with the basic nature of solvents and how different solvents act differently.

Paper: CH-302 (Physical Chemistry Theory)

CO 1: Students will be able to relate the basic concept of thermodynamics with their every day world and will understand that how the stability of whole universe is effected with different laws of thermodynamics.
CO 2: Students will cater the basic difference between path and state functions.
CO 3: Students will understand the concept of entropy and how the whole universe is related to it.
CO 4: Students will inculcate the importance of equilibria and how different forms of equilibrium are different from each other and are affected by various external parameters
CO 5: Students will be able to calculate thermal efficiency of heat energies and solve problems based on laws of thermodynamics.
CO 6: Students will be able to determine the Nernst distribution law and can relate to various factors causing its deviation.

Paper: CH-303 (Organic Chemistry Theory)

CO 1: Students will understand the need for introducing IUPAC nomenclature for organic compounds and will also be able to write IUPAC nomenclature for different functional groups.
CO 2: Students will be able to differentiate between different chemical and physical reactivity amongst organic compounds based on presence of different functional groups.
CO 3: Students will be able to learn how alcohols and phenols are two different classes.
CO 4: Student will get a thorough learning of the basic concept of UV spectroscopy and how it can be used in organic chemistry to identify the type of electronic transitions, cause for the colour of compounds and their stability.

Paper: CH-304 (Practical)

CO 1: Experimentation enhances the skills of managing the resources, time and team work.
CO 2: Students will be able to function as a member of an interdisciplinary problem solving team.
CO 3: Students will be skilled enough to perform gravimetric analysis.

CO 4: Students will be forced to think in an inclined manner via performing chemistry experiments.
CO 5: Students will be able to detect the presence of extra elements in any given unknown sample, thereby inculcating the concept of logical thinking.

Semester-IV

Paper: CH-401 (Inorganic Chemistry Theory)
CO 1: Enables to describe the chemical and physical properties of f-block elements including lanthanides and actinides specifically reasoning for anomalous electronic configuration.
CO 2: Enables to differentiate between acidic and basic radicals and how they can be further useful in research as well as day to day life.
CO 3: Enables to individuate qualitative analysis from qualitative analysis.
CO 4: Enables to understand different theories of precipitation and how they are unique from each other.

Paper: CH-402 (Physical Chemistry Theory)
CO 1: Enables to understand the advance domain of thermodynamics.
CO 2: Enables to conceptualize the second law of thermodynamics and how it is related to entropy.
CO 3: Enables to clearly distinct entropy and enthalpy
CO 4: Students will acquire knowledge of how to apply third law in calculating entropy associated with various phases of matter and pure crystalline solid.
CO 5: Students have advance knowledge of work function, Gibb's energy and their significance for criteria of spontaneous reactions.
CO 6: Students understand the essential conditions for a system to be spontaneous or non-spontaneous.

Paper: CH-403 (Organic Chemistry Theory)
CO 1: Enables to familiarize with the concept of IR spectroscopy and how it can be applied in day to day life.
CO 2: Enables to differentiate between compounds containing oxygen and nitrogen functional groups.
CO 3: Enables to understand the effect of different reagents like LiAlH4, NaBH4 etc. in presence of different functional groups.
CO 4: Inculcate the understanding of mechanisms prevailing in organic synthesis.

Paper: CH-404 (Practical)
CO 1: Enables to determine the methods for calibration to quantitative analysis.
CO 2: Enables to perform graphical analysis for determining experimental results in the laboratory.
CO 3: Enables to analyse that how the colour of solution varies its absorption properties.
CO 4: Enables to expertly handle the apparatus used in calorimetric experiments.

Semester-V

Paper: CH-501(Inorganic Chemistry Theory)
CO 1: Students will understand the limitations of Valence bond theory (VBT) and how the structures of different compounds were not satisfied with the help of VBT.
CO 2: Students will have an idea why crystal field theory (CFT) was introduced.
CO 3: Students will know the difference in CFT of octahedral and tetrahedral complexes.

CO 4: Students will have a detailed knowledge on magnetic and electronic properties of transition metal complexes.
CO 5: Students will have a thorough understanding of stability in metal complexes governed by kinetic and thermodynamic parameter.

Paper: CH-502 (Physical Chemistry Theory)

CO 1: Students understand the need of quantum mechanics and shortcomings of classical mechanics.
CO 2: Students acquire quantitative knowledge of operators in quantum mechanics corresponding to classical observables.
CO 3: Students acquire adhere descriptive attitude for probabilities, postulates, wave functions and expectation values.
CO 4: Students acquire extensive knowledge about spectral information.
CO 5: Students acquire skills of understanding molecular spectroscopy, qualitative and quantitative description of vibrational, rotational and Raman spectra that plays key role in research.

Paper: CH-503 (Organic Chemistry Theory)

CO 1: Students will have the knowledge of principles of spectroscopy.
CO 2: Will have hands on training on structure determination of organic compounds using spectroscopic techniques.
CO 3: Will be able to understand that how NMR spectroscopy can be used to identify unknown compounds
CO 4: Will be able to classify different carbohydrates based on their structural and positional composition.
CO 5: Will understand the nature of metal-carbon bond present in organic compounds.
CO 6: Will understand the mode of action of different organic reagents because of the presence of different metals in them.
CO 7: Will understand the nature of action of reagents depend on the nature of metal-carbon bond.
CO 8: Will be able to acknowledge the use of organometallc compounds in biological systems and chemical reactions.

Paper: CH-504 (Practical)

CO 1: Students will have a comparative knowledge of different types of chromatography.
CO 2: Students can relate that how Rf values determine separation.
CO 3: Students will have a vast idea of different types of salts and the factors on which they are categorized into different groups.
CO 4: Students will be able to categorize and maintain a detailed record differentiating different radicals on the basis of different factors.
CO 5: Students will be able to apply the theory of common ion effect in the precipitation of compounds.

Semester-VI

Paper: CH-601 (Inorganic Chemistry Theory)

CO 1: Students will be able to relate the basic difference between acids and bases.
CO 2: Students will be able to cater this theoretical knowledge of acid-bases into practical world.
CO 3: Students will have an insight idea of the composition of biomolecules.

CO 4: Students will learn about the roles of metal ions in different physiological processes.
CO 5: Students will be able to relate to the compounds of silicon and phosphorous and applications of these compounds specially in greases.

Paper: CH-602 (Physical Chemistry Theory)

CO 1: Students will be familiarized with the electronic spectral properties of different compounds and how these properties affect the nature of compounds.
CO 2: Students will have a detailed idea of interaction of electromagnetic radiations with matter.
CO 3: Students will have a thorough knowledge of different types of solutions, on what factors the miscibility of different solutions depend, how colligative properties are related to different solutions, difference between ideal and non-ideal solutions.
CO 4: Will learn about the concept of phase equilibria and how phase equilibrias of two components are related.
CO 5: Will possess the skills to solve problems within broader context related to field of photochemistry.
CO 6: Will be capable of analyzing the impact of photochemistry in sustainable development to help society.

Paper: CH-603 (Organic Chemistry Theory)

CO 1: Students will be introduced about heterocyclic compounds in organic chemistry.
CO 2: Will be explained that how introduction of heteroatom amongst cyclic hydrocarbons change the properties of entire compounds.
CO 3: Will be given an idea of the application part of organic chemistry i.e. how they can use their theoretical knowledge into the real world.
CO 4: Will be taught about proteins, how they are formed from their smallest monomers amino acids and how arrangement of different amino acids changes the basic composition of proteins and peptides.
CO 5: Will be able to differentiate between primary and secondary structure of proteins.
CO 6: Will be able to describe the advantages of heterocyclic compounds in materials and pharmaceutical chemistry.
CO 7: Will be able to explain the synthesis and applications of industrially important polymers that find use in everyday life.

Paper: CH-604 (Practical)

CO 1: Students will be skilled to perform conductometry experiments.
CO 2: Students will be having hands on experience on pH meter and potentiometer.
CO 3: Students will be able to perform different synthetic reactions.
CO 4: Students will be able to analyse that how different processes are used for a single synthesis.
CO 5: Students will be able to carry out and record these experiments in a skilful manner.
CO 6: Students will be able to show competence in obtaining and interpreting data.

B.Sc. (N.M.) English

Semester-I
Paper: EN-01 English

CO 1: The students will achieve an increased fluency in reading and writing skills and are apprised about common errors they commit in their daily usage of words and sentences in the subject of English.
CO 2: The student will demonstrates an increase in awareness of translations, sentence formations and structuring as well as various grammatical rules.
CO 3: The poetry enhances the students understanding of various elements of poetry such as tone, diction, genre, figures of speech, symbolism and many more.
CO 4: The conclusion of the course will enable the students to incorporate personal experiences that can be used for creative writing and composition.

Semester-II
Paper: EN-02 English

CO 1: The syllabi of the course enables the students to develop a critical thinking and conceptual understanding of the same.
CO2: The essays in the course enables the students in the development of multi-dimensional approach and helps them to look at the sensitive issues of the society with a rational mindset.
CO 3: The understanding of writing letters enables the students to prepare for future professional correspondence as well as enhance their creative writing skills.
CO 4: The conclusion of the course will enable the students to incorporate personal experiences that will eventually help them to emerge as mature, responsible persons.

B.Sc. (N.M.) Sanskrit

बी. एस.सी तृतीय सत्र ES01 संस्कृत अनिवार्य

CO 1: सुभाषित पद्यों द्वारा नैतिकता का ज्ञान कराना।
CO 2: वैदिक कथाओ के माध्यम से पुरातन समाज का ज्ञान प्रदान कराना।
CO 3: व्याकरण में सन्धि के द्वारा वर्णों के मेल का ज्ञान कराना।
CO 4: शब्द रुप व धातु रुप द्वारा बौधिक क्षमता का विकसित करना।

बी. एस.सी चतुर्थ सत्र ES02 संस्कृत अनिवार्य

CO 1: सुभाषित पद्यों द्वारा नैतिकता का ज्ञान कराना।
CO 2: पशु– पक्षियों की कहानियों के माध्यम से सामाजिक, राजनैतिक और व्यवहारिक ज्ञान प्रदान कराना।
CO 3: व्याकरण में सन्धि के द्वारा वर्णों के मेल का ज्ञान कराना।
CO 4: अनुवाद द्वारा बौधिक क्षमता को बढ़ाना।

Programme Outcomes (POs) for B.Sc. Pass Programme

PO1: Scientific temperament and attitude among the science graduates

PO 2: The qualities of a science – observation, precision, analytical mind, logical thinking, clarity of thought and expression, systematic approach, qualitative and quantitative decision making are enlarged

PO 3: The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of their choice.

PO 4: This programme train the learners to extract information, formulate and solve problems in a systematic and logical manner.

PO 5: This programme enables the learners to perform the jobs in diverse fields such as science, engineering, industries, survey, education, banking, development-planning, business, public service, self business etc. efficiently.

Programme Specific Outcomes (PSOs) for Undergraduate Science Programmes

PSO1: This Programme enables the students to gain basic knowledge about various physical properties e.g. mechanical, electrical, magnetic, electronic & optical etc.. They also gain practical knowledge of applications of probability, statistical mechanics, solid state physics, quantum & nuclear physics.

PSO2: Students acquire knowledge about fundamental theories of chemical and scientific phenomena and their applications in everyday life.

PSO3: Students would become aware of the influence of chemistry on the environment and other areas beyond scientific field.

PSO4: Basic knowledge of mathematics & practical application of computer Programming in FORTRAN & other scientific languages is gained so as to solve scientific problems.

PSO5: This Programme also trains the learners to extract information, formulate and solve problems skilfully applying the analytical reasoning & critical thinking.

PSO6: Students get hands on training of scientific experiments which enables them to record the measurements accurately and analyse the experimental results.

PSO7: The qualities such as observation, precision, analytical & logical thinking, clarity of thought & expression, systemic approach, qualitative and quantitative decision making are enhanced.

PSO8: Students gain confidence in presenting the scientific results publically before subject experts.

PSO9: The present subject area of science will increase the capability of students in exploring interdisciplinary scientific research areas.

PSO10: This Programme acts as a launching pad to go for masters degree in physics/ chemistry/ maths/ computer science and pursuing research in science & technology. It also enables the graduate to appear for various competitive exams in diverse fields such as Defence, Banking, Industries & other Public Services to serve the nation.

PSO11: Students will have overall development with respect to moral and social values which benefits them at personal as well as society level leading them to become a better civilized citizen.

Students opting for optional paper of Computer Science in B.Sc. programme will have additional PSOs:

PSO1: Effectively applying the knowledge of computing principles and scientific theories to develop sustainable solutions to present and future computing problems.

PSO2: Utilizing computing concepts and solutions to create and initiate innovations by bridging the gap between computing industry experts and business leaders.

PSO3: Ability to use system design notations and applying system design engineering process in order to design, plan and implement software systems.

PSO4: Ability of analysing problems, identifying and defining the computing requirements, which may be appropriate to their solutions.

PSO5**:** Apply probability, statistics, mathematics through differential and integral calculus, sciences including applications appropriate to the Computer Science & Engineering topics

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B.SC. Computer Science

Semester-I

Paper 1.1 Computer Fundamentals & MS-Office

CO 1: Students will be able to learn the basic concepts of computer, its working, characteristics, merits and applications. Use of number systems, inter-conversion of number system and computer codes.

CO 2: This course will give an understanding of the concepts of I/O devices, computer memory.

CO 3: Understanding of the software, working of operating system, language translators and system utilities.

CO 4: They would be able to use word processor, spreadsheet and PowerPoint presentations.

Paper 1.2 Computer Architecture

CO 1: This course will help the students to learn the basic organisation and design of a digital computer perform arithmetic operation and use Boolean algebra and its operations.

CO 2: Students would be able to understand functional units of the processors like registers and design of logic circuits.

CO 3: Students should be able to understand and use the concepts of combinational circuits such as adders, multiplexers, flip flops etc.

CO 4: It would enable them to use simple computer with hardware design including data transfer and micro instructions like memory transfer, arithmetic and logical instructions, understand how memory and I/O instructions execute with timing constraints.

Paper 1.3 Practical based in paper 1.1 and 1.2

CO 1: This course will help the students to create, open, save, edit and format documents. They should be able to insert pictures, format text and graphics using different options in Ms-Word.

CO 2: Students should be able to understand and handle large volume data using spread sheets with the help of formulas, charts, graphs and functions available in Ms- excel.

CO 3: They should use MS – excel in preparation of reports, arithmetic calculations, preparation of different account statements.

CO 4: Students should be able to prepare presentations using features like sound effects, templates, drawing tools, charts and animation effects to make their presentations more interactive and attractive.

Semester- II

Paper 2.1 programming in C

CO 1: This course will help the students to understand the fundamentals of C language and developing programs in c language. Students should be able to use good programming practices using flow charts and algorithms in program designing.

CO 2: Students should be able to use loops and decision making statements to solve the problem and design, implement, test and debug the programs having loops, functions and arrays.

CO 3: Students should be able to understand and use the arrays, functions, pointers, unions and structures in programs.

CO 4: They should be able to implement different file handling operations such as reading, writing files in programs.

Paper 2.2Structures System Analysis and Design

CO 1: This course will help the students to understand the system, its types ,components and to collect data to analyse and specify the requirements of a system and implement different system development life cycle methods in real life projects.

CO 2: Students should be able to understand the tools used in system analysis and design. They should be able to apply system developing methodologies, tools and techniques in system development.

CO 3: Students should learn about the implementation techniques, testing techniques, design methodologies and form control in system development.

CO 4: Students will learn and use different types of system testing techniques, system maintenance and documentation in system development.

Paper 2.3 Practical based in paper 2.1 and 2.2

CO 1: This course will help the students to learn and use of flow charts and design algorithms for a problem and develop efficient program using good programming practices.

CO 2: Students should be able to understand the basic structure of C programs and design programs using different types of variables and operators.

CO 3: Students should be able to design C programs using decision making statements and functions.

CO 4: Students should be able to design programs using pointers, arrays, string, union, structure and use various file operations.

Semester -III

Paper 3.1 Data Communication and Networking

CO 1: Students will be able to understand basic concepts of Data Communication and networking mechanisms.

CO 2: Enable students to identify the various encryption techniques and coding schemes which help students to understand how data send to destination without any theft any hack.

CO 3: Will induce understanding and building the skills of link data from different layers and how data flow to various routes of network without any disturbance.

CO4: Will familiarise with the TCP And UDP protocols and their functioning to understand how data transfer on internet and how they can be assist in network design and implementation.

Paper 3.2 Object Oriented Design and C++

CO 1: Help understand the basic features of C++ and Object-Oriented Design.

CO2: Students will be able to apply the major object oriented concepts to implement object oriented programs in C++, Encapsulation, Inheritance and Polymorphism.

CO 3: Students will understand how to allocate dynamic memory to variables and handle file and data in C++ using constructors, pointers and able to handle project data in C++.

CO 4: Students will learn generic features of C++ and concepts like Virtual classes, Operator overloading and template

Paper 3.3 Practical based on paper 3.2

CO 1: Help students learn and explain object-oriented concepts and describe how these are implemented in C++ and identifying the features of C++ programming.

CO 2: Demonstrate students practical experience of object-oriented design in C++.

CO 3: Enable students implement and handle file data in C++ and dynamically memory allocation to variables.

CO 4: Make students understand to implement the generic templates and type conversion in C++.

Semester - IV

Paper 4.1 Data structure with C/C++

CO 1: Students should be able to understand the organisation of data using data structure concepts like array, stack, linked list and their time space trade-off.

CO 2: Students should be able to implement the graphs, dynamic allocation using linked list, accessing the data, language processing, backtracking through stack and queues.

.CO 3: Students will know how to use trees to maintain hierarchy of data, different tree traversals using nonlinear data structures and understand ,implement different operation on them.

CO 4: Students will be able to understand the concepts of sorting and searching techniques and their operations.

Paper 4.2 Operating System

CO 1: Make understand students the history and basic structure of operating system and how operating system work for the system.

CO 2: Enable students understand how to manage the various processes in system and different

scheduling to maintain the process synchronization.

CO 3: Will teach students Implementing the inter-process communications using concepts like semaphores, deadlocks and mange memory pages by paging and swapping in multi user systems.

CO 4: Support students understand the directory and file structure in operating system by various allocation methods and protect the file.

Paper 4.3 Practical based on Paper4.1

CO 1: Students will able to implement the array, stack and their operation.

CO 2: Students should use concepts linked list , queues in programs to access the data sequentially and allocate dynamically.

CO 3: Students will able to use trees to handle concepts like artificial intelligence, cryptography, image processing in real life applications.

CO 4: Students will be able to implement different sorting and searching techniques on data.

Semester - V

Paper 5.1 Database Management System

CO 1: Will enable students to differentiate between traditional file systems with database management system by specifying features, merits, functions and classifications of database systems.

CO 2: This course will help the students to understand data models, schemas, mappings and architecture of database systems.

CO 3: Students should be able to understand functional dependencies, design E-R diagrams and implement normalized database structures using different normalization forms.

CO 4: Will provide knowledge of SQL (DDL, DML, DCL) commands will help the students to query database systems.

Paper 5.2 Introduction To Internet and Web technologies

CO 1: The course contents will make the students to get familiarized with basics of the Internet Programming and use of different internet tools.

CO 2: The students will be able to acquire knowledge about secure data transmission over the internet, different internet service providers and also about Intranet.

CO 3: The course contents will let the students to demonstrate the important HTML tags for designing static pages using HTML.

CO 4: The students will be able to acquire knowledge and skills for developing interactive websites using HTML and CSS.

Paper 5.3 practical based on 5.1 and 5.2

CO1: Students should be able to learn and use different SQL syntaxes, DDL, DML, DCL commands, views and techniques to query data in database systems.

CO 2: Students should be able to implement complex SQL queries to access data from databases.

CO 3: Students will be able to learn the basic structure of HTML using different tags and understand the processes of website development i.e. designing the web page , writing the codes using html tags to design webpage.

CO 4: Make students learn to insert text, images, animated graphics, lists, tables, forms and to create frames in WebPages using HTML and CSS.

Semester-VI

Paper 6.1 VISUAL BASIC PROGRAMMING

CO 1: After competing this, the students will be able to develop the programs using object-oriented and event-driven programming, develop the skills and knowledge required to use essential features and capabilities of Visual BASIC.

CO 2: At the end of this, students will understand to design the programs using various types of operators in VB .The course content will also provide the practical knowledge in the field of visual basic programming. It will help in making the various computer programs that assist in making the various live projects in related areas..

CO 3: This course would empower the student to acquire skills and practical knowledge in the field of VB programming, which help the students in developing the applications by using various types of arrays and looping statements.

CO 4: At the end of this course, the student will be able to understand an overview of computers and visual programming. And the students will also be able to do database programming using DAO,ADO and Active-X controls.

Paper 6.2 Software Engineering

CO 1: This course will help the students to understand software engineering, crisis, and different software development life cycle models.

CO 2: Students should be able to apply software engineering practices (analysis, design, testing maintenance activities used in software development and develop efficient and reliable software.

CO 3: Students should be able to implement software quality assurance techniques in software development that it can meet the expected requirements and to prepare srs document, design document and software configuration management.

CO 4: They should be able to manage time, resources and cost in developing software's. They should be able to implement the software design principles and have awareness of testing problems as well as to develop a simple testing report.

Paper 6.3 Practical based on Paper 6.1

CO 1: This course will help the students to understand, learn and use visual basic environment, Its components, tools and event driven programming.

CO 2: Students should be able to design programs using variables and operators.

CO 3: This course will help the students to use control statements, decision making statements and repetitive statements to develop programs.

CO 4: Students should be able to use procedures, functions, form and Other controls (DAO, ADO, RDO and Active X controls).

CO5: Will demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)

Programmes (B.Sc. (Physics, Maths, Chemistry/Computer Science)/B.Sc.(Hons) Physics/B.Sc. (Hons) Chemistry/ B.Sc.(Hons) Mathematics
Common for All B.Sc. Programmes

PO 1: **Scientific and Social knowledge:** Gain and apply the knowledge so acquired of mathematics, physics, chemistry, computational skills and fundamentals, to the solution of complicated Scientific and technical problems besides to enable them to pursue higher courses..

PO 2: **Problem probing and analysis:** To probe**,** analyse**,** Identify, formulate, and to review literature for reaching solutions to scientific problems and to drive ultimately conclusions using rudiments of all natural sciences, language and IT knowledge.

PO 3: **Conceive, design and develop solutions:** To probe concepts**,** design and obtain solutions for complex scientific problems and design system elements that meet the required needs with appropriate consideration for the environmental, industry, the societal and environmental attributes.

PO 4: **Carry out investigations of difficult problems:** Use class-room knowledge and skills including formulation of experiments, and interpretation of data, and synthesis of the information to reach appropriate conclusions.

PO 5: **Modern technology usage:** Develop and apply appropriate techniques, resources, IT tools and activities within the limitations.

PO 6: **The scientist, economists, Political leadership and society:** Apply reasoning and knowledge to assess societal, Political, commercial, business managerial, technical, and cultural issues and decide responsibilities concerning the professional scientific and technical practices.

PO 7: **Environment and sustainability:** Assess the impact of the professional solutions relevant to industrial, societal and environmental and exhibit the knowledge and need for sustainable growth.

PO 8: **Conduct and Ethics:** Follow and apply the elements of good conduct and ethical principles, responsibilities and norms of the professional practice.

PO 9: **Work Compatibility:** Perform effectively as a team member or as an individual, in different groups, teams, and in multidisciplinary environs.

PO 10: **Communication Skills:** Develop communication skills effectively while discharging and performing professional activities with the technical community and with public at large, so as to be able to able to comprehend and write effective reports and documentation, and make effective presentations.

PO 11: **Financial and Project management:** Exhibit effectively knowledge and understanding of the professional projects and apply principles of financial management to manage projects.

PO 12: **Inculcation of Life-long learning:** Identify the need for, and ability to involve in independent and lifelong learning in the broadest context of technological Environment.

PO 13: **Gainful jobs and placements:** Find gainful employment in industry or government, be accepted at graduate or professional schools or find employment in school systems as instructors, teachers or administrators.

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PSO5**:** Apply probability, statistics, mathematics through differential and integral calculus, sciences including applications appropriate to the Computer Science & Engineering topics

Name of Programme: B. Sc. (Hons.) Chemistry

Course Outcome

Semester – I

Paper I: 101 Inorganic Chemistry (Theory)

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

CO 1: Understand that the wave function can be used to find a radial distribution function that d describes the probability of an electron as a function of distance away from the nucleus.

CO 2: State the atomic orbital names based on quantum numbers.
Relate the electronic configuration of an atom of an element to its position in the periodic table.

CO 3: Describe the concept of electronic shielding and effective nuclear charge (Zeff) and their relationship to trends in ionization energy, atomic and ionic radii and electro negativity.

CO 4: Recognize whether the type of bond between two atoms is covalent or ionic.

Paper II: 102Physical Chemistry (Theory)

At the end of the course, the students shoud be able to:

CO 1: Explain and apply Boyle's, Charle's, and Avogadro's gas Laws to observations of gas behavior.

CO 2: Solve the derivation of the Michaelis-Menten equation which is used essentially in understanding enzyme kinetics and its applications.

CO 3: Differentiate between Crystalline and amorphous solids. Also will have a deep understanding of Bragg's law of X - ray diffraction and distances between adjacent planes of the crystal.

CO 4: Have extensive knowledge about Liquid crystals that how liquid crystals have become ubiquitous in everyday applications ranging from miniature mobile telephones to high-definition flat-panel displays.

CO 5: Relate intermolecular forces to boiling points and surface tension

Paper III: 103 Organic Chemistry (Theory)

After studying this course the students will be able to:

CO 1: Know and recall the fundamental principles of organic chemistry that include chemical bonding, nomenclature, chemical reactions and mechanism.

CO 2: Recognize and draw structural isomers (constitutional isomers), stereoisomers including enantiomers and diastereomers, racemic mixture, and meso compounds.

CO 3: Recognize the basic practical skills for the analysis of organic compounds using chromatography.

CO 4: Predict the reactivity of an organic compound from its structure.

CO 5: Identify cis and trans relationship for the substituents on cycloalkanes.

Paper No.IV: 104 Optional Paper-I (Physics)

CO 1: Students can use this course in their daily life processes like in sports (application of Newton's 2nd law), feeling jerk during travelling (application of Newton's 1st law).

CO 2: Students do take more interest if they implement CM practically like in finding MOI of flywheel, finding value of 'g' using bar pendulum.

CO 3: After studying this course students will be aware of electrical hazards and able to implement basic actions to avoid unsafe work conditions.

CO 4: Students to be able to use ampere's law and the Biot-Savart law for the calculation of the magnetic field arising from simple combinations of conductors.

Paper No. IV: 104 Optional Paper-I (Botany)

This will enhance the knowledge of students that the plants are considered in different groups, based on flowering nature.

CO 1: Although plants belong to different groups but the students will come to know that the basic life pattern of all the plants is same.

CO 2: Students also come to know that which of the plants can be used for decorative purpose and which can be used as medicine.

Paper No. IV: 105 Optional Paper-II (Mathematics)

CO 1: Learn the basic fundamentals of sets, relation and functions, understanding the nature of roots of polynomial equations and ways of arrangement using permutation and combinations.

CO 2: Studying the trigonometric function and their emergence in real life, exploring the limits and continuity of various functions as a fundamental property of their behaviours.

CO 3: Calculating derivative and integration of regular and implicit functions using different methods and analysing the nature of inflexion and stationary points for any function.

Paper No. V: 105 Optional Paper- II (Zoology)

CO1: Systematic classification of animals being done with prime focus on inculcating capacity of identification of animals in day to day life. This goes in the line of syllabus provided from Poriferon Sycon to Star fish.

CO2: Parasites and disease causing organism like plasmodium, liverfluck, Ascarisetc are taught with special attention so that students develop scientific aptitude.

CO3: Internal structure of animals are taught with detailed diagram so that they have realistic knowledge of physiology and anatomy of animals.

CO4: The importance of animals are being expounded with reference to global issues like bleaching of coral reef, their restoration and challenges.

CO5: Lower animals from Porifera to Echinodermata are taught with type study of one specific animal. This add to knowledge of students of those animals which are important but are generally coastal and are exploited by human being.

Paper No. VI: 106 English

CO1: The student demonstrates an increase in awareness of parts of speech, phonetics, sentence formations, grammatical rules and other facets of it.

CO2: The course enhances the students speaking as well as reading skills.

CO3: The course will enable the student to engage in professional correspondence as well as refine their technical writing habits.

CO4: It also facilitates them to understand poetry from a variety of perspectives be it cultural, historical, psychological and intellectual.

Paper No. VII: 107 Inorganic Chemistry Practical

After completing this course, students will have the knowledge and skills to:

CO 1: Explain Qualitative analysis used to identify the cations and anions in a sample substance.

CO 2: Rationalize that unlike quantitative analysis, which seeks to determine the quantity or amount of sample, qualitative analysis is a descriptive form of analysis.

CO 3: Work in a sequence specified that cations are classified into six groups. Each group has a common reagent which can be used to separate the cation from the solution.
CO 4: Analyse the anions which are categorized in three groups.

Paper No. VIII :CH (H)-108 Physical Chemistry Practical

After completing this course, students will have the skills to:
CO 1: Understand the terms, water equivalent of calorimeter, enthaply of dissolution of salt etc.
CO 2: Acquire the skill to perform the experiment in the real lab, once they understand the different steps.
CO 3: Understand the unique property of colloidal system in causing the coagulation which can be better generalized in the form of Hardy-Schulse rule.
CO 4: Understand more meaningfully regarding determination of the surface area of activated charcoal by Langmuir adsorption isotherm.

Paper No. IX : 109 Organic Chemistry Practical

After completing this course, students:
CO 1: Acquire the skill to purify an organic compound through crystallization, distillation ascertaining its purity through melting point or boiling point.
CO 2: Understand the effect of impurities on the melting point or boiling point of a substance.
CO 3: Recognise the practical skills for the synthesis of organic compounds.
CO4: Understand the process of sublimation by taking various examples like naphthalene, iodine, camphor and study its application in dry ice.

Paper No. X : 110 Optional Paper-I (Physics Practical)

CO 1: Students can use this course in their daily life processes like in sports (application of Newton's 2nd law), feeling jerk during travelling (application of Newton's 1st law).
CO 2: Students do take more interest if they implement CM practically like in finding MOI of flywheel, finding value of 'g' using bar pendulum.
CO 3: After studying this course students will be aware of electrical hazards and able to implement basic actions to avoid unsafe work conditions.
CO 4: Students to be able to use ampere's law and the Biot-Savart law for the calculation of the magnetic field arising from simple combinations of conductors.

Paper No. X: 110 Optional Paper-I (Botany Practical)

After the completion of the course, students will
CO 1: Expertise in handling of sophisticated instruments and preparation of temporary mounts.
CO 2: Perceive the morphological information of various microorganisms through specimen.
CO 3: Recognize the symptoms of diseases in various plant specimens through mode of herbarium.
CO 4: Get familiarized with local flora and herbarium techniques.
CO 5: Get exposure of medicinal and botanical plant growth through field excursion.

Paper No. XI: 111 Optional Paper-II (Zoology Practical)

After the completion of the course, students will
CO 1: Expertise in handling of sophisticated instruments and preparation of temporary mounts such as spicules and gemmules etc.
CO 2: Perceive the morphological information of various microorganisms through specimen.
CO 3: Demonstrate digestive system of Pila through smart labs.

Semester – II

Paper XII: 201Inorganic Chemistry (Theory)

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

CO1 Explain the general characteristics of the compounds of the alkali metals

CO2 Describe structure and properties of some important compounds of carbon and silicon

CO3 Explain that noble gases' outer shells are full, they are extremely stable, tending not to form chemical bonds and having a small tendency to gain or lose electrons.

CO4 Understand the concept of qualitative and quantitative analysis.

Paper XIII: 202 Physical Chemistry (Theory)

At the end of the course, the students should be able to :

CO1 Understand the concept of rate change associated with chemical change.

CO2 Construct an electrochemical cell diagram.

CO3 Understand Kohlrausch Law and how it is used in Calculation of Molar Conductivity at Infinite Dilution For Weak Electrolytes & Calculation of Dissociation Constant For a Weak Electrolyte

CO4 Define the first law of thermodynamics in the context of ΔU.

Paper XIV: 203 Organic Chemistry (Theory)

After studying this course the students will be able to:

CO1 Recognize identifies alkenes showing geometrical isomerism.

CO2 List the characteristic reactions of alkenes and alkynes.

CO3 Differentiate between Exhaustible and inexhaustible natural resources.

CO4 Know criteria for aromaticity and familiarize with the terms aromatic and anti-aromatic.

CO5 Have deep understanding of mechanistic detail of SN1 and SN2 reactions.

Paper XV: 204 Optional Paper-I (Physics)

CO 1 This course helps the students To acquire knowledge and comprehend fundamentals of electromagnetism, to develop the capability to solve the magnetic circuits using the fundamental laws and To know the various applications which work on the principle of electromagnetic induction.

CO 2 This course helps the students To analyse various configurations of electrical circuits working with alternating supply and t o know how to make measurements of various quantities in single phase and three phase circuits.

CO 3 This course helps the students to acquire knowledge of semiconductor diode, diode rectifiers, principle and classification of oscillators and transistors.

Paper XV: 204 Optional Paper-I (Botany)

CO 1: Students will know that which of the physical and chemical processes occur in the plants also.

CO 2: How the plants perform different metabolic mechanism i.e. Photosynthesis (synthesis of food), movement, respiration, reproduction and excretion etc.

CO 3: The students will also come to know that the metabolic processes occurring in plants are similar to that of the processes occurring in animals.

Paper No XVI: 205 Optional Paper-II (MATHEMATICS)

CO 1 Defining another form of function as Matrices and all its properties of determinants, rank and solving simultaneous equations and checking its consistency.

CO 2 Analysing an important form of set with special properties-Groups, their subgroups, partition by equivalence relations into cosets and quotient group and their importance in real life symmetries.

CO 3 Learning about Cartesian coordinates and general equations of different conics. Defining scalar and vector products of vectors along with gradient and curl to find direction and magnitude of resultant vectors.

Paper No. XVI: 205 Optional Paper- II (Zoology)

CO1 Students will learn phylogeny of Hemichordates, Urochordates, Cephalochordates with scientific perpective.

CO2 Evolution and ancestral history of ectotherm will be expounded in detail and with practical approach.

CO3 Identification of snakes and their existing mechanism of biting and types will be dealt with great insight.

CO4 Students will be made acquainted with birds, their migration and flight adaptation with Mammalia class with special reference to human. Anthropology will be introduced to students.

Paper No. XVII : 206 English

CO1 The course will enable the student to familiarise themselves with the genre of short story.

CO2 Short stories will help them to develop practical wisdom among the students.

CO3 The understanding of writing letters enables the students to prepare for future professional correspondence as well as enhance their creative writing skills.

CO4 The conclusion of the course will enable the students to enhance their understanding of vocabulary.

Paper No. XVIII: 207 Inorganic Chemistry Practical

After completing this course, students will have the knowledge and skills to:

CO1 Understand an acid – base titration which is used to determine the unknown concentration of an acid or base by neutralizing it with an acid or base of known concentration.

CO2 Understand redox titration that determines the concentration of an unknown solution (analyte) that contains an oxidizing or reducing agent.

CO3 Rationalize that not all titrations require an external indicator. Some titrants can serve as their own indicators, such as when potassium permanganate is titrated against a colorless analyte.

Paper No. XIX : 208 Physical Chemistry Practical

After completing this course, students will have the skills to:

CO1 Understand the effect of temperature and hydrogen bonding on the viscosity of a liquid.

CO2 Determine the surface tension of a given liquid by using drop number method.

Paper No. XX : 209 Organic Chemistry Practical

After completing this course, students:

CO1 Acquire the skill to purify an organic compound through crystallization, distillation ascertaining its purity through melting point or boiling point.

CO2 Undertand the process called base hydrolysis (or saponification) of an ester and is a two step process to first obtain sodium benzoate solution, and then benzoic acid from ethyl benzoate.

CO3 Come to know about the techniques like the reflux distillation of a liquid and the recrystallization of a solid.

Paper No. XXI: 210 Optional paper-I (Physics Practical)

CO 1 The purpose of conducting physics lab in chemistry is to aware the students with the knowledge of physics practically.

CO 2 They are acknowledged by substitution method which helps them to find out high resistance.

CO 3 With the help of physics lab, they aware with the knowledge of CRO(cathode ray oscilloscope) through which they become capable to draw B-H curve.

CO 4 This lab course helps them to deal with the semiconductor diodes and their characteristics i.e. forward and reverse bias.

Paper No. XXI: 210 Optional Paper-I (Botany Practical)

CO 1: Students will get hands on experience of preparing solution of various concentration.

CO 2: Students will gain knowledge of various environmental factors affecting transpiration rate.

CO 3: Students will acquire capability of identifying different components of plants through chemical tests.

Paper No. XXII: 211 Optional Paper-II (Zoology Practical)

CO 1: Students will acquire capability of identifying different species of fishes.

CO 2: Students will get hand on experience of preparing whole mount sections of Protochordates.

CO 3: Students can efficiently differentiate various kind of birds and mammals of local place /zoo.

Semester – III

Paper XXIII: 301Inorganic Chemistry (Theory)

Upon completion of the course:

CO1 The students will be able to explain the fundamental concepts in coordination chemistry of transition metals.

CO2 The Students should be familiar with the basic knowledge of the non-aqueous solutions and applications of non-aqueous solvents in analytical chemistry.

CO3 The students should predict the relative stabilities of metal complexes with different ligands.

Paper XXIV: 302 Physical Chemistry (Theory)

At the end of the course, the students should be able to :

CO1 Recognize the basic terms of thermodynamics.

CO2 Predict the energy change in heat capacities at constant volume and pressure and their relationship.

CO3 Derive Joule's law and its application.

CO4 Derive relationship between modification of distribution law when solute undergoes dissociation

CO5 Recognize the degree of hydrolysis and hydrolysis constant of aniline hydrochloride.

Paper XXV: 303 Organic Chemistry (Theory)

After studying this course the students will be able to:

CO1 Recognize structures of acid halides, esters, amides, acid anhydrides.

CO2 Convert given name of alcohol to structure.

CO3 Write the order of reactivity of different carboxylic acid derivatives.

CO4 Describe different classes of alcohols.

Paper XXVI: 304 Optional Paper-I (Physics)

CO 1 Express the basic concepts of nuclear physics. can tell a chronology of some of the major events in nuclear physics can identify some introductory terminology can use the units and dimensions

CO 2 The student will learn to use the geometrical approximation, including Fermat's principle, the ray equation and paraxial matrix formalism for refractive and reflective surfaces. The student will be introduced to the design of optical systems and aberrations, with an emphasis on image forming systems.

CO 3 Students are expected to understand ray-based optical system analysis and design, and operation of simple optical instruments. Understand that light is an electromagnetic wave and understand properties of light caused by the wave nature such as polarization, interference and diffraction, and their applications.

Paper XXVI: 304 Optional Paper-I (Botany)

CO1 The students will gain the knowledge about the internal organisation of various tissues of the plants. How these tissue system support the life of plants.

CO2 The pattern of reproduction in plants and animals is almost similar. The students will understand about the reproduction method in plants.

CO3 Biotechnology will enhance the knowledge of the students in knowing that how the traits of the plants can be changed for the betterment or for curing the disease by altering the structure of gene or by changing the position of gene.

Paper No. XXVI: 304 Optional Paper-I (Physics)

CO 1 This lab course helps the students to aware with the knowledge of optics practically. They can find out the wavelength with the help of newton's rings.

CO 2 They can find out the resolving power of telescope and plane transmission grating.

CO 3 They become able to find out the diameter of thin wire by diffraction method using He-Ne laser.

CO 4 This lab course helps them to find out dispersive power and refractive index of a prism.

Paper No. XXVII: 305 Optional Paper-II (Maths)

CO 1 Explaining the concepts of limits and continuity and all basic properties that would define a function to be continuous or not. Calculating the limits and partial derivatives using some important theorems.

CO 2 Learning about Differential equations, its types, degree of differential equations and formation and finding solution of various types of differential equations.

CO 3 Solving homogeneous and non homogeneous differential equations and partial differential equations using method of separation of variables like Laplace and Diffusion equations in cartesian coordinates.

Paper No. XXVII : 305 Optional Paper- II (Zoology)

CO1 Students will learn more about internal structure of human body with detailed insight of digestive system, respiratory system, nervous system and their disorders.

CO2 Students will be expounded subject matter to develop research aptitude within them and conceive outlook for welfare of human race.

CO3 Metabolic activities in human bodies because of nervous system and endocrine system is dealt and expounded in unit III & IV.

CO4 Muscles and their functioning, twist and coordination are explained to inculcate idea of structure and future solutions to persistent disorders related to muscles.

Paper No. XXVIII : 306 Inorganic Chemistry Practical

After completing this course, students will have the knowledge and skills to:

CO1 Perform complexometric titrations which can further be applied to find hardness of drinking water.

CO2 Analyze the alkali content of antacid tablet with the application of volumetric analysis

CO3 Record the measurements, evaluate the errors from possible sources, and interpret the data.

CO4 Estimate the percentage of ferrous and ferric ions in sample mixture using dichromate solution

Paper No. XXIX : 307 Physical Chemistry Practical

After completing this course, students will have the skills to:

CO1 Find rate constant for the specific reactions such as hydrolysis of ester in the presence of a catalyst

CO2 Measure pH for acidic and basic solutions using pH meters.

CO3 Calibrate scientific instruments.

CO4 Preparation of experimental solutions.

CO5 Evaluate refractive index and specific refractivity for the daily usable solvents apply it in everyday life.

Paper No. XXX : 308 Organic Chemistry Practical

After completing this course, students will develop the skills of:

CO1 Estimating the percentage of hydroxyl groups in phenol.

CO2 Estimating the percentage of amine groups in aniline using acetylation method.

CO3 Applying neutralization method for determining the equivalent weight of acid.

CO4 Utilizing the silver salt method for the quantification of equivalent weight of an acid.

Paper No. XXXI: 309 Optional paper-I (Physics Practical)

CO 1 This lab course helps the students to aware with the knowledge of optics practically. They can find out the wavelength with the help of newton's rings.

CO 2 They can find out the resolving power of telescope and plane transmission grating.

CO 3 They become able to find out the diameter of thin wire by diffraction method using He-Ne laser.

CO 4 This lab course helps them to find out dispersive power and refractive index of a prism.

Paper No. XXXI: 309 Optional Paper-I (Botany Practical)

CO 1 Students gain practical knowledge of plant reproduction

CO 2 Students have hands on training in using various lab/instruments such as pH meter, colorimeter, water bath, auto clave, analytical balance, centrifugal machine etc.

CO 3 Students develop an understanding of staining techniques

Paper No. XXXII: 310 Optional Paper-II (Zoology Practical)

The students will do recording of simple muscle twitch with electrical stimulation.

CO1 The students will demonstrate the knee jerk reflux.

CO2 Students can prepare temporary mounts and examine mammalian skin, cartilage bone, muscle fibre and nerve cells etc.

Semester – IV

Paper XXXIII: 401Inorganic Chemistry (Theory)

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

CO1 Understand the various uses of lanthanides elements in flash light powders.

CO2 Know about actinides elements which are used as nuclear fuels for various purposes.
CO3 Predict appropriate alloys/heat treatments
CO4 Recognize and identify the phases in metallic materials and their effect on their properties.

Paper XXXIV: 402 Physical Chemistry (Theory)

At the end of the course, the students should be able to:
CO1 Recognize the basic concepts of thermodynamics.
CO2 Predict the reversible and irreversible reaction .
CO3 Understand the physical significance of third law of thermodynamics.
CO4 Recognize the reaction of electrochemical cells and types.

Paper XXXV: 403 Organic Chemistry (Theory)

After studying this course the students will be able to:
CO1 Recognize mechanism of different reactions related to carbonyl compounds.
CO2 Identify different functional groups by graph of peaks.
CO3 Write mechanism of different condensation reaction.
CO4 Recognize the reactivity of substituted aromatic amines.

Paper No. XXXVI: Optional paper-I (Physics)

CO 1 Apply techniques such as Fourier methods and ladder operators for selected problems in quantum mechanics. Describe the structure of the hydrogen atom and show an understanding of quantisation of angular momentum
CO 2 Apply the principles of statistical mechanics to selected problems. Apply techniques from statistical mechanics to a range of situations.
CO 3 Calculate absolute and gage pressure, and absolute temperature. calculate changes in kinetic, potential, enthalpy and internal energy.

Paper No. XXXVI: 404 Optional paper-I (Botany)

CO1 Students will come to know about the economic importance of the plants i.e. which plants can be used as food.
CO2 Which plants can be used in manufacturing various medicines/drugs.
CO3 Which plants and which parts of them can be used as species and condiments.
CO4 Which plants produce wood for manufacturing the furniture and door.
CO5 It will help the students to know various utilities of the plants.

Paper No. XXXVII: 405 Optional Paper- II (Zoology)

CO1 Students will get detailed knowledge about genes & mutations.
CO2 Mutagenesis and DNA repairing and pathways along with error prone repairing will be dealt with practical approach and knowledge.
CO3 Students will be made aware of various gene families and will compare different types of genomes with great care and this will be facilitated by showing various research done in this field.
CO4 Gene projects like human genome and mitochondrial genome are introduced. Mapping strategies will be explained with practical perspective and this will be linked to current developments in this field.

Paper No. XXXVII: 405 Optional Paper-II (MATHEMATICS)

CO 1 Solving differentiation and integration of Algebraic and Transcedental equations using different iterative methods like Simpson's rule, Newton Raphson method, etc. Defining events of any experiment and their probabilities.

CO 2 Applying the classical and axiomatic approach of finding relative frequencies and regression and correlation of bivariate data, rank correlation matrix and understanding the difference between regression and correlation.

CO 3 Explaining the use of scatter diagram and applying various tests like Chi-square test and test of significance on a classified data.

Paper No. XXXVIII: 406 Inorganic Chemistry Practical

After completing this course, students will have the knowledge and skills to:

CO1 Perform the gravimetric analysis for the precipitation of aluminum as oxalate.

CO2 Be confident in handling different chemical materials.

CO3 Learn the importance of precipitation technique.

CO4 Be arithmetically skilled and will be able to use measurement units appropriately.

Paper No. XXXIX: 407 Physical Chemistry Practical

After completing this course, students will have the skills to:

CO1 Set up electrochemical cell and determine the cell voltage.

CO2 Study the effect of acid strength kinetically on the hydrolysis of ester.

CO3 Measure the strength of acid by performing pH measurements.

CO4 Determine the concentration of binary mixture by using refractive index.

Paper No. XXXX: 408 Organic Chemistry Practical

After completing this course, students:

CO1 Will be able to determine and differentiate different functional groups.

CO2 Will be able to analyse physical properties of organic compounds like m.pt or b.pt.

CO3 Will be able to perform synthetic reactions containing different functional groups in organic compounds

Paper No. XXXXI: 409 Optional Paper-I (Physics Practical)

CO 1 This helps the students to study the ripple factor in a d.c power supply.

CO 2 This helps the students to study voltage doubler and trippler circuits.

CO 3 They can find out the peak, average and R.M.S value of a signal.

CO 4 They also aware with the Programme language (Quadratic, maximum and minimum of numbers). They can make programme which can use further in companies.

Paper No. XXXXI: 409 Optional Paper-I (Botany Practical)

CO 1 Students get analytical experinec of evaluating and presenting ethnobotanical data

CO 2 Students expertise in collecting samples and preparing herbarium for various medicinal and local species of plants

Paper No. XXXXII: 410 Optional Paper-II (Zoology Practical)

CO 1 Students will make project report on humans to develop scientific outlook.

CO 2 Students will do mutation detection and Ames test.

Semester – V

Paper XXXXIII: 501Inorganic Chemistry (Theory) - I

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

CO1 Recognize the bonding in transition compounds by VBT and CFST theories.

CO2 Learn that the magnetic moment of most of the transition metal ions are very close to spin only magnetic moment μ s

CO3 Identify conjugate acids and bases, and rules for strong & weak acids/bases, in both Bronsted and Lewis acid-base systems.
CO4 Understand the periodic trends of acidic, basic, and amphoteric compounds

Paper XXXXIV: 502 Inorganic Chemistry (Theory)-II

After the completion of the course, Students will be able to:

CO1 Know how to establish the relationship between the structures, to determine and elucidate mechanism in catalysis.
CO2 Recognize the biological reaction alkali and alkaline earth metals, nitrogen fixation, hemoglobin and myoglobin.
CO3 Recall why certain types of metal complexes can be used to treat cancer and discuss the mode of action for platinum drugs in cancer chemo-therapy.
CO4 Acquire basic electrochemical knowledge to understand corrosion processes.

Paper XXXXV: 503 Physical Chemistry (Theory) - I

At the end of the course, the students shoud be able to:

CO1 Able to recognize different regions for different spectroscopy.
CO2 Able to calculate dipole moment in given molecules.
CO3 Explain and discuss theories for photoinduced electron transfer and excitation energy transfer, and apply these methods in quantitative calculations
CO4 Define the terms phase, component, degree of freedom and phase rule concepts.

Paper XXXXVI: 504 Physical Chemistry (Theory) - II

At the end of the course, the students should be able to :

CO1 Have basic knowledge of nuclear structure, stable and unstable atomic nuclei, nuclear reactions and different modes of radioactive decay and also methods for measurements of radioactivity.
CO2 Have skills in handling and measurement of radioactive material.
CO3 Identify and explain differences between addition and stepwise polymerization.
CO4 Give examples of industrial application of polymers

Paper XXXXVII: 505 Organic Chemistry (Theory) - I

After studying this course the students should have:

CO1 Ability to identify organic compounds by analysis and interpretation of spectral data.
CO2 Ability to explain common terms in NMR spectroscopy such as chemical shift ,coupling constant and anisotropy and describe how they are affected by molecular structure.
CO3 Ability to differentiate between monosaccharides& disaccharides and must aware of mutarotation concept.
CO4 Ability to Illustrate how organosulfur compounds can be used in synthesis, with a focus on C—C bond formation and functional group interconversions.

Paper XXXXVIII: 506 Organic Chemistry (Theory)-II

At the end of the course, the students will:

Be familiar with the structures of important classes of heterocyclic aromatic organic compounds.
CO1 Be able to differentiate between natural and synthetic rubbers.
CO2 Define primary, secondary, tertiary and quaternary structure in proteins and identify the types of interactions important in each case.
CO3 Explain the use of phenolphthalein and methyl orange indicators for testing acids and bases.

Paper No. XXXXIX: 507 Inorganic Chemistry Practical

After completing this course, students will have the knowledge and skills to:

CO1 Prepare different kind of coordination complexes.
CO2 Differentiate different compounds on the basis of difference in concentration.
CO3 Differentiate between different isomers.
CO4 Understand the concept of permaganatometry.

Paper No. L: 508 Physical Chemistry Practical

After completing this course, students will have the skills to:

CO1 Perform diverse conductometric titrations.
CO2 Understand distribution law of different components in different mixture.
CO3 Conduct potentiometric titrations of different acid and base mixtures.
CO4 Identify optical active molecule and determine its specific rotation.
CO5 Perform colorimetric experiment by implementinf Lambert-Beer's Law

Paper No. LI : 509 Organic Chemistry Practical

After completing this course, students:

CO1 Will be able to understand the concept of chromatography and how it is used to separate a mixture.
CO2 Will be able to differentiate different types of chromatographic techniques.
CO3 Will be able to understand diverse lab techniques like steam distillation etc.
CO4 Will be able to synthesize organic compounds.
CO5 Will understand the concept of acid value, iodine number and saponification value

Semester – VI

Paper LII: 601 Inorganic Chemistry (Theory) - I

Upon completion of the course, the students:

CO1 Must be aware of the different types of polymers used in industry and the macromolecular nature of polymers.
CO2 Will be able to determine appropriate chromatographic technique and approach for analysis.
CO3 Will have a thorough theoretical and practical understanding of advanced analytical instruments, for example for measuring metals, proteins, medicinal and non-medicinal drugs.
CO4 Must know the principle of Ion Exchange Chromatography.

Paper LIII: 602 Inorganic Chemistry (Theory)–II

At the end of the course, the students shoud be able to:

CO1 Understand the types of water pollutants, their sources and fates.
CO2 Review the qualitative and quantitative characteristics of waste water.
CO3 Have awareness of the principles underlying the nuclear fission and fusion reactions.
CO4 Have awareness of the recent problems concerning with global warming, ozone hole, acid rain and smog formation.

Paper LIV: 603 Physical Chemistry (Theory)-I

At the end of the course, the students shoud be able to:

CO1 Recognize the basic rules of electronic spectroscopy.
CO2 Understand the vibrational Raman spectra
CO3 Predict the term symbols of diatomic molecules
CO4 Understand the basic principles of quantum mechanics.

Paper LV: 604 Physical Chemistry (Theory) - II

At the end of the course, the students should be able to :

CO1 Explain the blackbody which is perfect absorber and emitter of radiation

CO2 Understand the mechanism of catalysis.

CO3 Have awareness regarding the applications of chromatography like forensic testing, drug testing etc.

CO4 Know in brief about chemical bonding and learn about valence bond theory and molecular orbital theory.

Paper LVI : 605 Organic Chemistry (Theory) - I

After studying this course the students will be able to:

CO1 Explain why fats and oils are referred to as triglycerides.

CO2 Explain how the fatty acid composition of the triglycerides determines whether a substance is a fat or oil.

CO3 Identify the basic production method of the fermentation process.

CO4 Identify the principles of fermentation in food processing

Paper LVII : 606 Organic Chemistry (Theory) - II

After studying this course the students will be able to:

CO1 Explain isoprene rule.

CO2 Explain structure elucidation & synthesis of nicotine, cocaine.

CO3 Examine the impact of pesticides on the environment, the economy & the health and well-being of society.

CO4 Define the role of vitamins and hormones in organism

Paper No. LVIII: 607 Inorganic Chemistry Practical

After completing this course,students will have the knowledge and skills to:

CO1 Prepare the synthesis of complex compounds like copper tetramine and mercuric tetrathiocyanatocobaltate (II)

CO2 Be able to conduct conductometrically.

CO3 Be able to handle diverse lab instruments.

Paper No. LIX: 608 Physical Chemistry Practical

After completing this course, students will have the skills to:

CO1 Understand the concept of buffer and what buffers we use in our day to day life.

CO2 Differentiate different types of titrations and how they are specific for specific systems.

CO3 Understand the concept of colorimetry and how the colour of compound is dependent on the concentration of sample.

CO4 Be able to relate to the concept of equilibria.

Paper No. LX: 609 Organic Chemistry Practical

After completing this course, students:

CO1 Will be able to understand the concept of chromatography.

CO2 Will be able to differentiate between different chromatographic techniques.

CO3 Will be able to perform synthesis of various organic compounds.

CO4 Will be able to analyse that why chromatography is essential part of organic synthesis.

Programme Outcomes (POs) for B.Sc. (Hons.) Chemistry

PO 1: Students will have a deep insight of curriculum of Science and will have a specialised understanding of chemistry in detail.

PO 2: Students will acquire knowledge about fundamental theories of chemical and scientific phenomena and their applications in everyday life.

PO 3: Students will get hands on training of scientific experiments which enables them to record the measurements accurately and analyse the experimental results. This will make them aware of doing things systematically and inculcate scientific approach.

PO 4: The qualities such as observation, precision, analytical and logical thinking, clarity of thought and expression, qualitative and quantitative decision making are enhanced.

PO 5: Students gain confidence in presenting the scientific results publically before subject experts.

PO 6: Students will learn that how varied hypothesis were being converted into theories.

PO 7: The present subject area of chemistry will increase the capability of students in exploring interdisciplinary scientific research areas.

PO 8: Graduates from this course will be better prepared to understand the new environment-friendly systems and can understand the processes that the chemical industry is adopting.

PO 9: The programme prepares the students for pharmaceutical industries, chemical manufacturers, forensic science department, plastic industries, agrochemical industries etc. Apart from these, they also have a chance to get recruited in other fields such as oil, gas and power sectors and even in defence.

PO 10: Students have many options to pursue their higher studies in number of branches of chemistry like M.Sc in Chemistry, Analytical chemistry, Drug chemistry, Forensics, Organic chemistry, Inorganic chemistry, Physical chemistry and Material sciences.

Programme Specific Outcomes (PSOs) for B.Sc. (Hons.) Chemistry

PSO 1: Students will have a deep insight of curriculum of Science and will have a specialised understanding of chemistry in detail.

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PSO 9: The Programme prepares the students for pharmaceutical industries, chemical manufacturers, forensic science department, plastic industries, agrochemical industries etc. Apart from these, they also have a chance to get recruited in other fields such as oil, gas and power sectors and even in defence.

PSO10: Students have many options to pursue their higher studies in number of branches of chemistry like M.Sc. in Chemistry, Analytical chemistry, Drug chemistry, Forensics, Organic chemistry, Inorganic chemistry, Physical chemistry and Material sciences.

COURSE OUTCOMES
Name of Programme: B.Sc. Physics (Hons.)

Semester- I

Mathematical Physics (Phy-101)

CO 1: This course helps students to be familiar with the main mathematical methods used in physics.

CO 2: This course will enable students to understand the orthogonal curvilinear coordinates which further helps them to find the operators like gradient, divergence, curl, etc. in cylindrical as well as spherical coordinate systems.

CO 3: This course will train students in problem solving skills, related to hypothesis building, application of the scientific method, and mathematical methods to analyse physics theories and devise solution strategies.

Mechanics (Phy-102)

Co 1: Students will be able to apply what they learn in their daily life activities like sports(application of Newton's 2^{nd} law), in their movement or journeys(law of inertia) etc..

CO 2: This would enable students to have clear understanding of some important aspects like escape velocity- velocity needed for an object to escape from the influence of gravitational field, launching of satellites and rockets etc.

CO 3: Help students to appreciate the implementation of the laws practically say via finding out moment of inertia of flywheel in the laboratory. It will enable the students to think and make them capable of implementing them practically, besides will also convey the significance of the contents when applied to other areas of science such as astronomy (celestial mechanics), chemistry (dynamics of molecular collision).

Electricity (Phy-103)

CO 1: Students will be able to obtain systematically the equations that characterize the performance of electric circuit as well as solving complicated networking circuits and bridges

CO 2: Students are made aware of the electrical hazards and are able able to implement basic actions to avoid unsafe work conditions.

CO 3: Students will be able to acquire and interpret experimental data to examine the physical laws and that will help to understand the concepts related to capacitors, dielectrics, potential and implementing these in different circuits according to their uses

Mathematics –I (Phy-104)

CO1: This course enables the students learn an understanding of limits and how they are used in infinite sequences &series, describe fundamental properties of real numbers that lead to the formal development of real analysis.

CO2: Students learn how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.

CO3: Students learn and decide on convergence/divergence/ oscillate of a wide class of sequence and series of real numbers, express correctly the definition of basic concepts from the course unit, for example definition of limit point, convergence etc.

CO4: Through this course, students will be able to prove statements involving the properties of real number system, definition of the limit point of a sequence, Cauchy sequence, will be able to demonstrate an understanding convergence, absolute convergence, conditional convergent.

Chemistry-I (Phy-105)

CO 1: Students are able to learn nature of bonding and hybridisation of compounds and can predict the structure and geometry of different compounds.

CO 2: They learn the structures of homoatomic and heteroatomic molecules by Molecular Orbital Theory.

CO 3: Would enable them learning the concept of bonding and how the theories of bonding govern the structures of different compounds. Further on the basis of basic information , they will develop skills to analyse the structure of unknown compounds.

CO 4: Students would know how to draw structures of ionic solids and understand properties besides they know now the importance of coordination compounds in inorganic reaction mechanism.

Linear & Digital Integrated Circuits and Instruments I (Phy-106)

CO 1: This subject will help students to understand the basic concepts working behind logic circuit and their application in day-to-day life

CO 2: Students can compare the digital representation information with analogue representation

CO 3: Student will be able to write the data in coded form as well as decode the encrypted data

CO 4: Course will provide ability to model, analyse and test a digital circuit

CO 5: Students can design circuits such as Digital Counters, Shift registers for data storage and amplifiers for various application such as integration and differentiation

Physics Practical (Phy-107)

CO 1: This course helps students to familiarise with measuring instruments like Vernier callipers, screw gauge, CRO and electronic equipments.

CO 2: This course will enable students to familiarise with pendulum, moment of inertia, high resistance by substitution method, electrical vibrators etc..

CO 3: This course helps students to nurture in all branches of physics and will prove that they can think critically and work independently.

CHEMISTRY-PRACTICAL (Phy-108)

CO 1: Students are able to apply the theoretical concepts while performing experiments.

CO 2: They are enabled to design, carry out, record and analyze the results of chemical experiments.

CO 3: They would be Able to understand the principle for microanalysis by paper chromatography.

CO 4: Students will acquire the habit of working safely with the chemicals and handling of equipment.

CO 6: They are able to acknowledge experimental errors and their possible sources.

English (Literature & Language-I) Q-101

CO 1: The students will demonstrate an increase in awareness of parts of speech, phonetics, sentence formations, grammatical rules and other facets of it.

CO 2: The course enhances the students speaking as well as reading skills.

CO 3: The course will enable the students to engage in a better professional correspondence as well as refine their technical writing habits.

CO 4: It also facilitates them to understand poetry from a variety of perspectives be it cultural, historical, psychological and intellectual.

Semester-II

Mathematical Physics-II (Phy-201)

CO 1: This course helps students to understand the ordinary differential equations which further help them to find the solution of homogeneous & non-homogeneous equations by various methods like D operator, variation of parameters.

CO 2: This enables students to be familiar with the concept of Fourier series which help to find the output of half wave & full wave rectifiers, square & triangular wave, etc.

CO 3: This course provides students to gain the knowledge of errors which help them in least square fitting of data.

Mechanics (Phy-202)

CO 1: This course helps the students to learn about the phenomenon occurring in nature like the attraction of two bodies(earth and sun). Students become aware of the concept of gravity.

CO 2: They come to know about gravitational field and can find out the gravitational potential energy, gravitational force occurring between two bodies.

CO 3: Students learn the famous theory of relativity given by Einstein. They would find out how the mass length and time would vary with speed.

Electricity (Phy-203)

CO 1: This course helps students to understand the magnetic properties of matter and describe magnetic field produced by magnetic dipole and electric current.

CO 2: They are able to understand hysteresis curve and how it finds its use in different electronic circuits

CO 3: This course helps students to understand mutual and self inductance beside understand the use of Faraday's law and to articulate the relationship between electric and magnetic field and how can it be exploited to generate electricity.

Mathematics –II (Phy-204)

CO1: Students are able to demonstrate the ability to interpret geometrically the derivatives and integrals of real valued functions of several variables.

CO2: They can define and recognize the real functions ability to apply the theorem in a correct mathematical way.

CO3: They can communicate mathematical ideas with clarity and would also explain the fundamental concepts of functional analysis and their role in modern mathematics and applied context.

CO4: They become adept in problem-solving applied to diverse situations in physics, engineering and other mathematical context using this technique

Chemistry II-Theory- Phy-205

CO 1: Students will understand the concept of aromaticity and differentiate between aromatic, anti-aromatic and non-aromatic compounds.

CO 2: Are able to understand the differentiate between chiral and achiral carbon centres.

CO 3: They learn to recognize and draw constitutional isomers,stereoisomers, including enantiomers and diasteromers, racemic mixture and meso compounds.

CO 4: They can now perceive different kind of reactions occurring amongst the organic compounds.

CO 5: Can differentiate between reactants and reagents.

Linear & Digital Integrated Circuits and Instruments- II (Phy-206)

CO 1: This course helps students to understand basic sequential circuits and their applications.

CO 2: This course enables students to analyse, build & troubleshoot different flip-flops as switch and shift registers for data storage.

CO 3: This course will help students to design counters for counting and understanding of conversion of signals by A/D & D/A converter, to understand electronic instruments as 555 Timer, power supply as rectifiers filters and to understand basic functions & use of oscilloscope.

Physics Lab-II (Phy-207)

CO 1: This course helps students to demonstrate their understanding of electronic circuits by using opam-741 , astable and monostable oscillator.

CO 2: This course helps students to familiarise with Carey foster bridge, pendulums, LCR circuits.

CO 3: Will enable students to nurture knowledge of all branches of physics and will make them think critically and work independently.

Chemistry Lab-II(208)

This course deals with the practical aspects of physical chemistry. From this course, student will be :

CO1: Able to design experiments that can be applied in everyday life based on the parameter of surface tension.

CO 2: Learning statistical approach for evaluating data.

CO 3: Efficiently perform various conductometric and potentiometric titration of strong acid and strong base.

CO 4: Enabled to determine the molecular mass of polymer using viscosity method.

English (Literature & Language –II) Q-201

CO 1: The course will enable the student to familiarise themselves with the genre of short story.

CO 2: Short stories will help them to develop practical wisdom.

CO 3: The understanding of writing letters enables the students to prepare for future professional correspondence as well as enhance their creative writing skills.

CO 4: The conclusion of the course will enable the students to enhance their understanding of vocabulary.

Semester-III

Mathematical Physics (Phy-301)

CO 1: This course addresses a number of important mathematical methods often used in physics. By making this course as a part of student's life, he will have a good grasp of the basic elements of complex analysis including the important integral theorems. He will be able to determine the residues of a complex function and use the residue theorem to compute certain types of integrals.

CO 2: This course helps the students to understand Taylor and Laurents series and Binomial expansion which play crucial role in other subjects of physics. By learning these theorems, student get to know how to expand the functions and will be able to use the latter to solve mathematical problems relevant to the physical sciences.

CO 3: After learning this course, student will receive training in clear argumentation, reasoning and presentation and how to present their results in a tidy way. Student will learn and have practiced cooperation, formulating good questions and explaining to others

Thermal Physics (Phy-302)

CO 1: This course (Thermal physics) will help to understand the concept of heat and its conversion from one form to another. Thermodynamics can be used in our daily life such as laws of thermodynamics is used in refrigerators, air-conditioners, heat pumps etc.

CO 2: One of the important fields of thermodynamics is heat transfer, which relates to transfer of heat between two media. The concept of heat transfer is used in wide range of devices like heat exchangers, evaporators, condensers, radiators, coolers, heaters, etc.

CO 3: Students will use to see how all types of air and gas compressors, blowers, fans run on various thermodynamical cycles.

CO 4: They will be made aware of the laws of thermodynamics that dictate energy behavior

Vibrations and wave optics-1(Phy-303)

CO 1: Studying this course will give the students a thorough fundamental knowledge of coherence ,interference and interferometery.

CO 2: Students will be able to analyze and understand interference between plane waves and spherical waves, reflection and transmission of plane waves and helps students to understand the behaviour of superposition and familiarise with different phenomenon of light and waves.

CO 3: This will help the students to perform laboratory experiments in optics and document their results using correct procedure and protocols. Further, this will also help students to understand the principle of superposition of waves to explain the phenomena of interference of waves ,standing waves and their problem solving concepts.

Quantum Mechanics (Phy-304)

CO 1: Students will be able to identify and understand the kinds of experimental results which are incompatible with classical mechanics that required a development of the quantum theory of matter and light

CO 2: Students will have fair understanding of solving Schrodinger Wave equation to obtain the wave function for basic potentials in one dimension

CO 3: Student will understand the role of uncertainty principle in determining only one attribute at a time either position or velocity

CO 4: Students will be familiar with the main aspects of historical development of Quantum mechanics and be able to interpret the experiments that reveal wave property of matter

Mathematics –III (Phy-305)

Students will be able to:

CO1: Demonstrate an understanding to describe the basic difference between uniform convergences, point wise convergence of sequence and series of real numbers, and perform simple proofs.

CO2: Appreciate the importance of probability and statistics in computing and research develop skills in presenting quantitative data using appropriate diagrams, tabulation, summaries.

CO3: Understand the basic probability axioms & rules, Moments of discrete & continuous random variables as well as familiar with common named discrete and continuous random variable.

CO4: Have understanding of how the elementary functions can be defined by powers series, with an ability to deduce some of their easier properties.

Computer fundamental and Programming-I (Phy 306)

CO 1: Students will able to learn the basic architecture of computer system, knowledge of hardware and software parts and can solve the number system question.

CO 2: Students would understand the concept of microprocessor, internal working of microprocessor and its architecture, different addressing modes and understands the data transfer instructions.

CO 3: Students will able to learn the basic concept of Fortran ,variables ,different statements to solve scientific calculations.

Co 4: Students will learn the different conditional statements of data, errors correction, functions and able to solve the numerical problems and how to handle flow control of data.

Physics Lab-III (Phy-307)

CO 1: At the end of this course, the students will be able to use CRO, Spectrometer, Ballistic Galvanometer and determine relative parameter in electrical circuits.

CO 2: Students will be able to find the Resolving Power, Dispersive Power and Wavelength of Prism and Grating by using principles of optics and demonstrated the phenomenon of Interference by Fresnel's Bi-prism and Newton's Ring experiments.

CO 3: Students will show that they have learned laboratory skills, enabling them to take measurements in Physics laboratory and analyze measurement to draw conclusion.

Digital, Microprocessor & Computer lab-I (Phy 308)

CO 1: This course helps students to analyse, design and can build a broad range of combinational circuits

CO 2: This course helps students to understand the basic logic gates and to verify their truth table

CO 3: This course helps students to design AND, OR, NOT & XOR gate using NAND gates & their verification

CO 4: This course helps students to demonstrate the understanding of flip-flops & 7- segment display driver

Semester-IV

Mathematical Physics (Phy-401)

CO 1: This course helps the students to understand beta and gamma functions which further help them in other subjects of physics.

CO 2: The students are introduced to the special functions like Bessel, Legendre, Hermite & Laguerre. They come to know about their recurrence relations, their generating functions, their Rodrigue's formula.

CO 3: This course enables them to understand the differential equations of wave and heat equations in 1-D, 2-D $ 3-D and makes them enabled to solve the problems related to the steady flow of heat in rectangular and circular plate.

CO 4: They are made aware of the Laplace equation in Cartesian, cylindrical and spherical coordinate systems.

Thermal Physics –II (Phy-402)

CO 1: On completion of this course students will be familiar with thermodynamic laws, entropy, magnetic work, Clausius inequality and the processes.

CO 2: This course helps the students to know about thermodynamical potentials, Maxwell relations and their applications .

CO 3: This course will enable the students to know about change of phase,triple point and different orders of phase transitions.

Vibrations and Wave Optics-II (Phy-403)

CO 1: This course helps students to understand the thorough fundamental knowledge of diffraction and Holography.

CO 2: This course helps students to analyze and understand the resolving power and dispersive power of plane diffraction grating .

CO 3: This course helps students to understand Fresnel and Fraunhofer Diffraction for slit , wire , circular aperture etc and also helps to analyze the concept of interference between two plates by using the concept of Holography.

Atomic ,Molecular and Nuclear Physic (Phy-404)

CO 1: This course helps students to understand basic properties of nucleus and its models.

CO 2: This course helps students to learn basic atomic concepts and principles with different types of atomic spectra.

CO 3: This course enables students to explain the key properties of many electron atoms and the importance of Pauli Exclusion Principle.

CO 4: This course helps students to explain the observed dependence of atomic spectral lines on externally electric & magnetic fields.

Mathematics –IV (Phy-405)

CO1: This course introduces students to the basic theory behind the development and assessment of statistical analysis techniques in the areas of point and interval estimation, demonstrate computational skills to implement various statistical inferential approaches.

CO2: Provides them the ability to derive the distributional results needed for statistical inference and also demonstrate skills in interpreting and communicating the results of statistical analysis, orally and in writing.

CO3: Make them realize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.

CO4: Enables them to appreciate the connections between theory and applications and be lifelong learners who are able to independently expand their mathematical or statistical expertise when needed, or for interest's sake.

Computer fundamental and Programming-II (Phy 406)

CO 1: Students will able to learn the basics of various error analysis and computational methods e.g. floating points methods, overflow and under flow, bisection methods, Newton Raphson method and related programming .

CO 2: Students will be able to solve various linear & non-linear equations and related programming.

Co 3: Students will be enabled to learn various interpolation methods e.g.Newton forward and backward process and related programming

CO 4: Students will learn the Integration methods and the solution of ordinary differential equations.

Physics Lab-IV (Phy-407)

CO 1: This course helps students to measure the high resistance and charge by leakage method and determine dielectric constant by using ballistic galvanometer.

CO 2: Make them understand to find the self inductance , mutual inductance, heat conductivity of good and bad conductor and demonstrate the phenomenon of Interference and Diffraction to find the thickness , refractive index and intensity .

CO 3: This course helps them to learn laboratory skills, enabling them to take measurements in Physics laboratory and analyze measurement to draw conclusion.

Digital, Microprocessor & Computer Lab-II (Phy-408)

CO 1: This course helps students to familiarize with the computer language and microprocessor kit.

CO 2: This course helps students to understand the programming language and using Fortran language and make them able to find polynomial, quardratic equation, power of number , factorial , matrices etc.

CO 3: This course trains students to learn laboratory skills, enabling them to take measurements in Physics laboratory and analyze measurement to draw conclusion.

Semester-V

Mathematical Physics-V(Phy-501)

CO 1: This course helps students to be familiar with the main mathematical methods used in physics.

CO 2: This course helps students to understand the groups, rings and fields. Also the introduction of vector space helps them to solve complex problems in an easier way.

CO 3: This course helps students in understanding matrices which is further used in paraxial optics to derive formulae for system of lens.

CO 4: This course develops student problem solving skills and scientific skills.

Electromagnetic Theory (Phy-502)

CO 1: On completion of the course the student shall be able to formulate potential problems within electrostatics, magnetostatics and stationary current distributions in linear, isotropic media, and also solve such problems in simple geometries using separation using separation of variables and the method of images.

CO 2: Student will be able to define and derive expressions for the energy of the electrostatic and magnetostatic fields, and derive Poynting's theorem from Maxwell's equations and interpret the terms in the theorem physically.

CO 3: Shall enable them to describe and make calculations of plane electromagnetic waves in homogeneous media, including reflection of such waves in plane boundaries between homogeneous media of variables and the method of images.

CO 4: Enable them to analyze the nature of electromagnetic wave propagation in guided medium which are used in microwave applications.

Statistical Physics-I(Phy-503)

CO 1: After studying this students will be able to understand the features of microscopic world that helps in understanding the Quantum Mechanical formulation of Statistical Mechanics.

CO 2: This helps the students to analyze and debate society problem of energy , environment and climate based on fundamental principle of thermodynamics and Statistical Physics.

CO 3: The objective of this course is to develop an understanding of statistical nature of laws of thermodynamics, to examine basic theory of statistical mechanics and to apply this

theory to wide variety of interesting problems and also familiarise the interesting concepts of laser.

Physics of Material (Phy-504)

CO 1: Students will be able to describe the different type of crystal structures in terms of crystal lattice and basis of constituents' atoms

CO 2: Students can formulate the theory of X – ray diffraction in the reciprocal lattice formalism and apply this knowledge to generalize the formulation for matter waves

CO 3: Students will have understanding of elastic property of the solids and the lattice vibrations (phonons)

CO 4: They will be able to identify the materials encountered in the course in a representative modern device, analyse why these are used and propose better alternatives, if necessary

Electronics Devices: Physics and Application-I(Phy-505)

CO 1: Electronics is a part of our everyday life. It creates interest in the students to learn Physics. We are living in an electronic era where numerous electronic applications that change our daily life in the nearby future. Once the student read this course carefully and deeply, no electrician will be needed to call to repair their home appliances.

CO 2: Students will be stimulated to give their efforts to understand the things by themselves only. They start to think about the real life electronic gadgets. This course gives them courage to do the things practically. This course helps the students to make the circuits independently.

CO 3: This course provides various job opportunities in various industries It opens the path for the students to make their career successful.

Nantechnology (Phy-506)

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CO 1.This course introduces the fundamentals of nano scale engineering and manufacturing, current and future applications of nano structured materials and their impact on other technologies.

CO 2: This programme of study will help to develop student's academic curiosity and give him understanding and respect for scientific values such as openness,

CO 3: The students will learn the ins and outs of this technology-the technology of the day.They will learn to take advantage of enhanced properties such as higher strength, lighter weight, increased electrical conductivity, and chemical reactivity compared to their larger-scale equivalents.

Physics Lab-V (Phy-507)

CO 1: At the end of this course, the students will be able to demonstrate their understanding of magnetic field by analyzing the B-H Curve and solenoid.

CO 2: Students will be able to find the resolving power, magnifying power of telescope and demonstrate knowledge of optics by analyzing the phenomenon of polarization.

CO 3: The various experiments in the area of optics and magnetism will nurture the students in all branches of physics to think critically and work independently.

Physics Lab-VI & Project (Phy-508)

CO 1: This course would help students to understand the use of OPAMP and its various applications(differentiator & integrator).

CO 2: This course demonstrates the understanding of p-n junction diode as half wave and full wave rectifier.

CO 3: This course will enable students to demonstrate the characteristics and operation of FET as an amplifier.

Semester-VI

Mathematical Physics-VI (Phy-601)

CO 1: This course helps students to be familiar with the concept of Cartesian tensors.

CO 2: This course helps them to understand the Fourier transform which further helps finding sine and cosine transforms.

CO 3: This course helps students to understand the Laplace transform which further helps them to find the solution of first and second order ordinary differential equations & partial differential equations.

Electromagnetic Theory (Phy-602)

CO 1: The students are able to know and to use transmission line analysis techniques.

CO 2: They will be able to analyze waveguides structures propagating TE, TM or TEM modes, e.g., rectangular or circular waveguides, coaxial lines, surface wave lines, strip line, and microstrip lines.

CO 3: They are able to understand the concepts of microwave network analysis.

CO 4: They would be able to design various impedance matching devices such as stub tuners and multi-stage quarter wave transformers.

Statistical Physics- II (PHY-603)

CO 1: This course helps students to develop an understanding of statistical nature of the laws of thermodynamics, to examine the basic theory of statistical mechanics and to apply this theory to wide variety of interesting problems .

CO 2: This course helps students to understand the method of Statistical Physics ,that are used to develop the statistics for Bose-Einstein, Fermi-Dirac and photon gas.

Co 3: This course will enable them to understand the concept of entropy and their consequences.

Physics of Material II (Phy-604)

CO 1: This course helps students to learn dielectric & electrical properties of materials.

CO 2: This course helps students to understand free electron model and its inadequacies with the results from Hall Effect and specific heat of metals.

CO 3: This course helps students to know the energy bands and formation using Bloch theorem.

CO 4: This course enable students to understand the difference between conductors, insulators and semiconductors.

Electronics Devices: Physics and Applications-II (Phy-605)

CO 1: This course helps the students to deal with the amplifiers. They come to know about various related characteristic parameters like current gain, voltage gain and power gain.

CO 2: Students learn various classes of amplifiers-A,B,C and get to know the feedback in amplifiers (Voltage and current feedback).

CO 3: This course helps the students to learn about the oscillators(Barkhausen criterion, Colpitts, phase shift and crystal oscillator) besides they learn the devices like multivibrators (astable, bistable and monostable)

CO 4: This course helps the students to deal with unijunction Transistor.

Nano Technology (Phy -606)

CO 1: This course helps the students to know about variation in XRD peaks,Photoluminescence peaks and Raman spectra of nano materials.
CO 2: This course helps the students to know the different methods of preparation of nanomaterials.
CO 3: By this course students will be using this technique will also be able to know about different bottom up and bottom down techniques such as cluster beam evaporation,chemical bath deposition and ball milling etc.

Physics Lab-VII (Phy-607)

CO 1: This course helps students to demonstrate their understanding of magnetic field by analyzing the e/m and magnetic susceptibility, PE Hysteresis.
CO 2: This course helps students to find the Boltzmann constant, Stefan's constant and demonstrate knowledge of solid state physics by analyzing the phenomenon by H ???alpha emission and absorption lines in rotational spectrum
CO 3: This course enables students to understand various physics streams and will make them think critically and work independently.

Physics Lab-VIII & Project (Phy-608)

CO 1: This course enable students to demonstrate their understanding of electronic circuits by using ICs, rectifier, transistors, multivibrator, UJT etc.
CO 2: This course helps students to familiarise with diodes, piezo electric crystals, solar and network theorem.
CO 3: This course helps students to understand well all the branches of physics

Programme Outcomes (POs) for B.Sc. (Hons.) Physics

PO 1: This programme encapsulates every dimension of physics along with basics of Chemistry, Mathematics & Computer. Therefore it is a complete programme in itself which comprehensively touches every aspect of science.
PO 2: This programme leads to expertise the students for gaining depth knowledge of various fields of Physics like Optics, Electronics, Material Science, Thermal Physics etc.
PO 3: This programme acts as a launching pad to initiate the students for higher degree in physics. It also enables the students to appear for various competitive exams in different fields such as Defence, Banking, Industries & other Public Services to serve the nation.
PO 4: This programme provides the technical platform for the enhancement of research capabilities of students. Thus , motivate the students to explore the future aspects in physical world.
PO 5: This programme act as a skill booster to enhance the qualities such as observation, precision, analytical and logical thinking, clarity of thought and expression, systematic approach in Student's personality.
PO 6: Students have overall development with respect to moral and social values which benefits them at personal as well as society level leading them to become a better civilized personality.

Programme Specific Outcomes (PSOs) for B.Sc. (Hons.) Physics

PSO 1: This Programme encapsulates every dimension of physics along with basics of Chemistry, Mathematics & Computer. Therefore it is a complete Programme in itself which comprehensively touches every aspect of science.

PSO 2: This Programme leads to generate the expertise among the students for gaining depth knowledge of various fields of Physics like Optics, Electronics, Material Science, Thermal Physics etc.

PSO 3: This Programme acts as a launching pad to initiate the students for higher degree in physics. It also enables the students to appear for various competitive exams in different fields such as Defence, Banking, Industries & other Public Services to serve the nation.

PSO 4: This Programme provides the technical platform for the enhancement of research capabilities of students. Thus, it motivates the students to explore the future aspects in physical world.

PSO 5: This Programme acts as a skill booster to enhance the qualities such as observation, precision, analytical and logical thinking, clarity of thought and expression, systematic approach in students' personality.

PSO 6: Students will have overall development with respect to moral and social values which are going to benefit them at personal as well as society level, leading them to become a better civilized citizen.

COURSE OUTCOMES
Name of Programme: B.Sc. (Hons.) Mathematics

Course Outcomes (COs)
Semester-I

Paper Code: BHM 111 Algebra

CO 1: Algebra provides the foundation for high school mathematics, critical thinking and problem solving , Algebra helps students transfer their mathematical knowledge to more algebraic generalisations.

CO 2: Students will solve problems using equations, graphs and tables to investigate linear relationships. Technology will be used to introduce and expand upon the areas of study listed above.

CO 3: **S**tudents will learn how to find roots of quadratic, biquadratic and cubic equations.

Paper Code: BHM 112 Calculus

CO 1: Learn the general concept of function and its applications to real-world situations and work with exponential, logarithmic and trigonometric function and their applications in applied problems.

CO 2: Learn the concepts of the derivative and its underlying concepts such as limits and continuity and to calculate derivative for various type of functions suing definition and rules.

CO 3: Learn the various concept of derivative to completely analyze graph of a function. And learn about various applications of the derivative in applied problems.

CO 4: Learn about anti-derivative and the Fundamental Theorem of Calculus and its applications and to use concept of integration to evaluate geometric area and solve other applied problems.

Paper Code: BHM 113 Solid Geometry

CO 1: The study of the surface and solids in space, especially cones, cylinders prisms, pyramids, polyhedral, and spheres. Solid Geometry also includes the study of points, lines, shapes and regions in relation to solids and surfaces.

CO 2: In this we identify, describe, compare and classify different geometric solids and visualize and represent geometric figures with special attention to spatial relationship.

CO 3: Deduce properties and relationship between figures from a given assumptions. Understand and apply geometric properties and relationships. Develop an appreciate of geometry and means of describing physical world.

Paper Code: BHM 114 Discrete Mathematics-1

CO 1: Learn the basic concepts of Sets, Relations namely equivalence relation, partial order relations, concept of mathematical induction, pigeon hole principle and its applications

CO 2: Students study logical operations, logical equivalence, conditional propositions, Tautologies and contradictions. Students will understand Boolean algebra and truth tables.

CO 3: Learn about ideas of Permutations and combinations, concepts of probability, basic theory of Graphs and rings. Students will understand how to apply combinatorial ideas to practical problems.

CO 4: Study about some functions namely Discrete numeric functions, Generating functions, recurrence relations with constant coefficients.

Paper Code: BHM 115 Descriptive Statistics

CO 1: Students will learn various types of data, how Collection of data is done, classification and tabulation of data. Learn how to represent the data using histograms, frequency polygon, frequency curve and ogives

CO 2: Learn how to use Mean, median, mode, geometric mean and harmonic mean, .study about Measures of Dispersion, Absolute and relative measures of range, quartile deviation, mean deviation, standard deviation , coefficient of variation through which they will be able to rectify data in practical problems.

CO 3: Moments, Skewness and Kurtosis: Moments about mean and about any point and derivation of their relationships, effect of change of origin and scale on moments, Sheppard's correction for moments (without derivation),

Paper Code: BHM 116 Computer Fundamental and MS- Office

CO 1: Learn about the fundamentals of computer, history of computer. Students should be able to know about different types of memory and storage devices.

CO 2: Understanding the concept of input and output devices of computers and how they work.

CO 3: Recognize when to use Microsoft office programs to create professional and academic documents.

CO 4: Apply skills and concepts to make slides in Power Point, acquiring the skill to learn techniques in MS-Excel

Paper Code BHM 118 English-I

CO 1: Part-A Poetry("Let Me Not to the Marriage of True Minds" by William Shakespeare "Death Be not Proud" by John Donne)

CO 2: Part-B Phonetics (Introduction to the Sound system of English: Phonetics Symbols, Organs of Speech, Transcription of Words (Oxford Advance Learners' Dictionary by Hornby to be followed).

CO 3: Grammar : Parts of Speech, Types of Sentences, Common Errors, Technical Writing (application writing, business letter).

Semester-II

Paper Code: BHM 121 Number Theory and Trigonometry

CO 1: The main application of Number Theory is to protect data into from being transmitted electronically. Most of the modern cryptosystems rely on Number Theory.

CO 2: Number Theory involves study of Euclidean algorithm, highest common factor, prime numbers, prime factors action, partiality testing, congruence, Fermat's little theorem, Quadratic residues.

CO 3: The basic involves analyzing the algebraic structure & graph of trigonometry and inverse trigonometry functions to determine intercepts, domain, range, intervals on which the function is increasing decreasing or constant.

CO 4: To check the symmetry of graph, to fixed asymptotes, to check whether function is one to once etc. Identify & express the conics in standard rectangular form, graph of conics& solve applied problems involving conics.

Paper Code: BHM 122 Ordinary Differential Equations

CO 1: Show an awareness of initial and boundary conditions to obtain particular values of constants in the general solution of second-order differential equations.

CO 2: Identify a general method for constructing solutions to inhomogeneous linear constant-coefficient second-order equations.

CO 3: Recognize the proper technique and solve initial value problem for first order equations. Solving of initial value problems for higher order linear homogeneous and non homogeneous equations

Paper Code: BHM 123 Vector Calculus

CO 1: Vector Calculus helps us to understand how to mathematically describe physical & abstract quantities that have both magnitude & direction, increases knowledge of properties of functions whose domain consists of real no's & range consists of vectors including differential & integration.

CO 2: Students will be able to find length of a vector, the unit vector i direction of a given vector & the cosine of the angle between two vectors in 3-space.

CO 3: Calculate scalar product, vector product of two vectors & scalar triple product of three vectors, write vector equation & symmetric equation for a line & vector equation & scalar equation of a plane.

Paper Code: BHM 124 Discrete Mathematics-II

CO 1: To appreciate the basic principles of Boolean algebra, logic and duality. Students must be able to understand all types of digital networks and Karnaugh map.

CO 2: Be able to understand the concept of lattices and be able to apply various operations on lattices (Complement, Distribution)

CO 3: Acquiring the ability to draw graphs, understand them. Students must acquire the skill to understand paths and circuits. They must be able to differentiate between them.

CO 4: Be able to understand trees and solve problems related to it. Students must learn how to represent algebraic expressions using binary trees. They must acquire the skill to solve shortest path problems and searching problems.

Paper Code: BHM 125 Regression Analysis and Probability

CO 1: Learn the concept of regression and must be able to implement the principle of least square method in problems successfully.

CO 2: Acquire the ability to understand correlation and regression. Students must know the difference between correlation and regression and practical use of them. They must also know about the curvilinear regression.

CO 3: Students must know the basic terminology of probability and should be able to solve Boole's inequality

CO 4: Learn about the application of Bayes' theorem, definition and properties of random variable. They must also acquire the skill to solve problem related to random variables.

Paper Code: BHM 126 Programming in Visual Basic

CO 1: Students must have gained a good understanding of the basic concepts of object orientation. They must be clear about of the Visual Basic language structure and language syntax

CO 2: Students must know all the functions under menu bar in Visual Basic. They must acquire the skill for database programming.

CO 3: Students must be able to make crystal reports. They must have knowledge about all library functions viz string, numeric , time related and other miscellaneous functions.

CO 4: Students will be able to effectively develop applications with full functionality and a graphical user interface using the language Visual Basic

Paper Code: BHM 129 English-II

CO 1: Part-A short stories

1. 'The Bet' by Anton Chekhov
2. 'Gift of Magi' by O Henry
3. 'The Postmaster' by Rabindranath Tagore

CO 2: Grammar and Writing Skills
a) Synonyms and Antonyms
b) Prefix-Suffix
c) Homophones and Homonyms
d) One word substitution

Semester-III

Paper Code: BHM 231 Advanced Calculus

CO 1: The students are expected to learn about the basic principles of multi variable calculus with proof. Advanced Calculus is a bridge between Calculus and more advanced real analysis.

CO 2: Student will learn Completeness axiom, Archimedean property, Triangle inequality, Convergence of sequence, Sum product and Quotient of convergence sequence.

CO 3: Monotonic sequence, Bolzano Weierstrass Theorem, Monotone convergence Theorem, Uniform continuity on a closed and bounded interval, limits of function, Derivative of polynomial, Derivative of inverse function, Chain rule, Mean value theorem, Rolle's theorem.

Paper Code: BHM 232 Partial Differential Equations

CO 1: PDE describes relations between continuously changing quantities which depends on two or more variables. The main goal of this course is that student should be able to solve Boundary value problem for Laplace equation, Heat equation, wave equation by separation of variables in Cartesian, polar spherical & cylindrical coordinates.

CO 2: Students will be able to expand one variable function in series along basis of orthogonal function, for example Fourier series, Bessel's series, Legendre's series.

CO 3: They will be able to find weight function, Eigen values and Orthogonal function system(Eigen function for a given strum-Liouville problem and used the Fourier and Laplace Transform as part of solving a Boundary Value Problem.

Paper Code: BHM 233 Statics

CO 1: Student will be able to demonstrate the application of vectors for the analysis of statics equilibrium and analyze different structural elements like trusses, frames and beams.

CO 2: Demonstrate understanding of principle of kinematics and kinetics of particles and planar rigid body and identify techniques for measurement using instrumentation with recognition of the principle of data collections.

CO 3: Students learn to apply the principles of work and energy as well as impulse and momentum and practical's.

Paper Code: BHM 234 Differential Geometry

CO 1: Explaining One Parameter family of Surfaces : Envelope, Characteristics , edge of regression , Developable surfaces. Developables Associated with a Curve : Osculating developable, Polar developable, Rectifying developable.

CO 2: Defining Two- parameter Family of Surfaces: Envelope, Characteristics points, Curvilinear coordinates, First order magnitudes, Directions on a surface, The normal, Second order magnitudes, Derivatives of n.

CO 3: Exploring Principal directions and curvatures, First and second curvatures, Euler's theorems, Dupin's indicatrix,. Conjugate directions, Conjugate systems. Asymptotic lines, Curvature and torsion, Isometric parameters, or minimal curves.

CO 4: Understanding Geodesics and Geodesic Parallels: Geodesics: Geodesic property, Equation of Geodesics, Surface of revolution, Torsion of Geodesic. Bonnet's theorem, Joachimsthal's theorems, Vector curvature, Geodesic curvature, κ_g , Other formulae for κ_g , Bonnet's formula.

Paper Code: BHM 235 Probability Distributions

CO 1: Students will be able to compute generating functions of various probability functions. They will be able to solve tchebychev's inequality and understand the concept of weak and large numbers.

CO 2: Acquire the ability to solve problem based on Bernoulli, binomial , poisson and hyper-geometric distributions.

CO 3: They must be able to classify among the various distributions. Students must be able to use the correct distribution formula in the problems.

CO 4: Learn about normal distribution, must able be study z value from the table. They must also learn the applications of normal distribution and successfully implement them.

Paper Code: BHM 236 Database Management and Oracle

CO 1: Define terminologies of database, Drawbacks of conventional file systems, Data administrator (Role and functions), Characteristics of databases, Data redundancy, Data integrity, Data independence. DBMS and its functions. Advantages and disadvantages of database

CO 2: Explain three levels of the architecture: External level, Conceptual level and Internal level, Mappings and Schemas, Client/Server architecture, Distributed processing.

CO 3: Define Data model, Relational data model, Hierarchical data model, Network data model. Relational model, Basic structure, Terminology. Normalization, First Normal Form, Second Normal Form, Third Normal Form, BCNF, Relational algebra and Relational Calculus

CO 4: Database Triggers: Use & type of database Triggers, DatabaseTriggers Vs. Declarative Integrity Constraints, Creating a Trigger, BEFORE vs AFTER Trigger Combinations, Dropping a Trigger.

Semester-IV

Paper Code: BHM 241 Sequences and Series

CO 1: This course involves the study of real and complex numbers, and their properties, particularly completeness, define and study limits of sequences, convergence of series and power series.

CO 2: Students will have detailed understanding of how Cauchy's criteria for the convergence of real and complex sequences and series follow from the completeness axiom of real numbers.

CO 3: Students will develop an understanding of how the elementary functions can be defined by power series, with an ability to deduce some of their easier property, knowledge of simple technique for testing the convergence of sequence and series and students will gain confidence in applying theorems.

Paper Code: BHM 242 Special Functions and Integral transforms

CO 1: To make student understand the basic concepts of complex variables and special functions and to make them able to understand mathematical concepts that provide a foundation for the mathematics.
CO 2: Students will be able to demonstrate a sound understanding of elementary functions, analytically Cauchy Riemann equations.
CO 3: Students will learn special functions such as Gamma and Beta functions, Bessel's function and Legendre polynomial, Power series solution of ordinary differential equations.
CO 4: Understanding D'Alembert's solutions of Wave equation and separation of variables of Heat equation, Laplace equation in different coordinate system.

Paper Code: BHM 243 Programming in C and Numerical Methods

CO 1: To provide suitable and effective methods called Numerical Methods, for obtaining approximate representative numerical results of the problems. To solve problems in the field of Applied Mathematics, Theoretical Physics and Engineering this requires computing of numerical results using certain raw data
CO 2: To solve complex mathematical problems using only simple arithmetic operations. The approach involves formulation of mathematical models of physical situations that can be solved with arithmetic operations
CO 3: To deal with various topics like finding roots of equations, solving systems of linear algebraic equations, interpolation and regression analysis, numerical integration & differentiation, solution of differential equation, boundary value problems, solution of matrix problems.

Paper Code: BHM 244 Hydrostatics

CO 1: Understanding Pressure equation. Condition of equilibrium. Lines of force. Homogeneous and heterogeneous fluids. Elastic fluids. Surface of equal pressure. Fluid at rest under action of gravity. Rotating fluids.
CO 2: Fluid pressure on plane surfaces. Centre of pressure. Resultant pressure on curved surfaces. Equilibrium of floating bodies. Curves of buoyancy. Surface of buoyancy. Stability of equilibrium of floating bodies. Metacentre. Work done in producing a displacement. Vessels containing liquid.
CO 3: Defining Stability of equilibrium of floating bodies. Metacentre. Work done in producing a displacement. Vessels containing liquid.

Paper Code: BHM 245 Elementary Inference

CO 1: Understanding and analyzing the Parameter and statistic, sampling distribution and standard error of estimate. Point and interval estimation, Unbiasedness, Efficiency, Consistency and Sufficiency. Method of maximum likelihood estimation. Null and alternative hypotheses, Simple and composite hypotheses, Critical region, Level of significance
CO 2: Understanding one tailed and two tailed tests, Types of errors, Neyman- Pearson Lemma. Testing and interval estimation of a single mean, single proportion, difference between two means and two proportions. Fisher's Z transformation.
CO 3: Defining Chi-square statistic, Chi-square tests for goodness of fit and independence of attributes. Definition of Student's't' and Snedcor's F-statistics. Testing for the mean and variance of univariate normal distributions, testing of equality of two means and two variances of two univariate normal distributions.

Paper Code: BHM 246 Data Structure using C

CO 1: Understanding Data structure and its essence, Data structure types. Linear and list structures: Inverted lists, threaded lists, Operations on all these structures and applications.
CO 2: Knowledge of Arrays, Multidimensional arrays, sequential allocation, address calculations, sparse arrays. Tree structures: Trees, binary trees and binary search trees.
CO 3: Graph data structure and their applications. Graph traversals, shortest paths, spanning trees and related algorithms. Family of B-Trees: B-tree, B*-Trees, B+ Trees.
CO 4: Use of Sorting: Internal and external sorting. Various sorting algorithms, Time and Space complexity of algorithms. Searching techniques and merging algorithms. Applications of sorting and searching in computer science.

Semester-V

Paper Code: BHM 351 Real Analysis

CO 1: Student will be able to define and recognize the basic properties of real numbers and improve an outline logical thinking.
CO 2: They will be able to define and understand the series of real numbers and their convergence. Students will be able to use the Bolzano Weierstrass Theorem.
CO 3: Recognition and knowledge of basic topological properties of real numbers. Understanding of real functions and its limits.
CO 4: Understanding of continuity of real functions and differentiability of real functions with its related theorems.

Paper Code: BHM 352 Groups and Rings

CO 1: Students will be able to learn the meaning and properties of Groups, Subgroups, Lagrange's theorem, Cauchy's theorem, Cyclic Groups.
CO 2: Students will have understanding of Cosets, Quotient groups, Homomorphisms, Isomorphism, Automorphism, inner automorphism of cyclic groups, Cayleys theorem, centre of a group and derived subgroup of a group.
CO 3: Recognition of Rings, Subrings, Integral domain and fields, characteristics of a ring, ring of homomorphism, ideals and quotient rings.
CO 4: Understanding Euclidean rings, Polynomial rings, Polynomial over rational field, Eisentein's criteria.

Paper Code: BHM 363 Numerical Analysis

CO 1: Application of numerical methods (such as Bisection, False position, Newton-Raphson) to solve nonlinear equations. Computation of the errors and the rates of convergence
CO 2: Recognize Iterative methods (Jacobi –Gauss Seidel). Analyze the Finite difference-Forward and backward difference table. Construct numerical methods to solve ordinary differential equations
CO 3: Apply the Interpolation methods (Newton forward and backward difference interpolation formula-Lagrange interpolation formula) for solving the problems numerically.
CO 4: The student should be shown the ability of working independently and with groups.

Paper Code: BHM 354 Integral Equations

CO 1: Student will understand the meaning of Linear integral equations, Initial-value problems reduced to Volterra integral equations, Method of successive approximation to solve Volterra integral equations of second kind, Iterated kernels and Neumann series for Volterra equation. Laplace transform method for a difference kernel.

CO 2: Introduction to Boundary value problems reduced to Fredholm integral equations, method of successive approximations to solve Fredholm equation of second kind, Iterated kernels, Resolvent kernel as a sum of series

CO 3: Understanding Green's function. Use of method of variation of parameters, properties of the Green's function, construction of the Green's function by using its properties. Reduction of a BVP to a Fredholm integral equation with kernel as Green's function.

CO 4: Homogeneous Fredholm equations with symmetric kernels, Solution of Fredholm equations of the second kind with symmetric kernel, Method of Fredholm Resolvent Kernel, Fredholm Equations of the First Kind with Symmetric Kernels.

Paper Code BHM 355 Methods Of Applied Mathematics

CO 1: Student will able to find the Solution of 3D Laplace, wave and heat equations in spherical polar co-ordinates and cylindrical polar co-ordinates by the method of separation of variables. Fourier series solution of the wave equation, transformation of boundary value problems.

CO 2: Student will learn about Fourier transform solution of boundary value problems. The heat equation in an infinite cylinder and in a solid sphere. Hankel transform of elementary functions. Operational properties of the Hankel transform. Applications of Hankel transforms to PDE.

CO 3: Student will understand Moments and products of inertia, Angular momentum of a rigid body, principal axes and principal moment of inertia of a rigid body, kinetic energy of a rigid body rotating about a fixed point

Paper Code BHM 356 Operations Research-I

CO 1: Operation Research is used for defence capability acquisition decision making. It is used to find optimal or near optimal solutions to complex decision making problems.

CO 2: It is used in finding maximum (of profit or yield) in real-world objective. It is used in finding minimum (of loss or cost) in real-world objective. It is used in data envelopment. It has strong ties to computer science and analytics.

CO 3: Develop a working knowledge of concepts and methods related to designing and managing operations and supply chains. Develop a skill set for quality and process improvement.

Semester-VI

Paper Code: BHM 361 Real and Complex Analysis

CO 1: Develop an in-depth mathematical understanding of the theory of calculus. Read mathematical results and proofs as well as formulate their own proofs to various problems.

CO 2: Use and explain the importance of the axioms of real numbers the definition of convergent and divergent sequences the definition of the limit of a function at a point the definition of continuity the definition of the derivative the definition of the Riemann integral.

CO 3: Perform basic mathematical operations (arithmetic, powers, roots) with complex numbers in Cartesian and polar forms. Determine continuity/differentiability/analyticity of a function and find the derivative of a function. Work with functions (polynomials, reciprocals, exponential, trigonometric, hyperbolic, etc) of single complex variable and describe mappings in the complex plane.

Paper Code: BHM 362 Linear Algebra

CO 1: To understand model and systematically solve systems of linear equations using matrix notation. Demonstrate factual knowledge of the fundamental concepts of spanning, linear independence, and linear transformations

CO 2: Use of matrix algebra to analyze and solve equations arising in many applications that require a background in linear algebra. Utilize vector space terminology and describe how closely other vector spaces resemble R^n

CO 3: Dissect the action of a linear transformation into elements that are easily visualized using the basic concepts of eigenvectors and eigen values.

Paper Code: BHM 363 Dynamics

CO 1: Students will be able to draw the free-body diagram for a particle or for a rigid body in plane motion. Students will be able to understand the basic concepts of force, mass and acceleration, of work and energy, and of impulse and momentum.

CO 2: Students will be able to apply these three basic methods and to understand their respective advantages. Students will be able to explain the geometry of the motion of particles and plane motion of rigid bodies.

CO 3: Students learn to apply the principles of static equilibrium to particles and rigid bodies. Students learn to analyze truss and frame structures. Students apply the principles of equilibrium for analyzing beams. Students analyze problems involving frictional forces. Students learn to draw shear force and bending moment diagram

CO 4: Students analyze planar rigid body kinematics and kinetics. Students learn to write technical laboratory reports. Students apply measurement techniques and formulate experiments based on laboratory handouts.

Paper Code: BHM 364 Elementary Topology

CO1: Student will be able to define with examples topological spaces. Neighborhoods, Interior point and interior of a set , Closed set as a complement of an open set , Adherent point and limit point of a set, Closure of a set, Derived set, Properties of Closure operator, Boundary of a set , Dense subsets, Interior, Exterior and boundary operators.

CO 2: To learn the basic concepts of elementary topology; this includes topological spaces, bases, connectedness, compactness, continuity, homeomorphisms, convergence.

CO 3: Student will able to understand Compact spaces and subsets, Compactness in terms of finite intersection property, Continuity and compact sets, Basic properties of compactness, Closedness of compact subset and a continuous map from a compact space into a Hausdorff and its consequence.

Paper Code: BHM 365 Fluid Dynamics

CO 1: Understanding kinematics- eulerian and lagrangian methods. Stream lines, path lines and streak lines. Velocity potential, irrotational and rotational motion, vortex lines, equations of continuity and boundary surfaces.

CO 2: Students will learn acceleration at a point of fluid, component of acceleration in cylindrical and spherical polar coordinates, pressure at a point of a moving fluid, Bernoulli's Equations

CO 3: Acyclic and cyclic irritation motion, kinetic energy of irrational flow, liquid streaming past a fixed sphere, equation of motion a sphere, three dimensional sources, sinks, Doublets and their images, Stoke's stream functions.

Paper Code BHM 366 Operations Research-II

CO 1: Student will be able to learn about inventory control(introduction, factors affecting inventory, inventory models), deterministic models such as economic order quantity

model when shortage is allowed/not allowed, prize discount model, multi item inventory model.

CO 2: Student will understand Queuing theory (characteristics of queuing theory system, birth death situations, steady state solutions of Markovian queuing model with single and multiple servers.

CO 3: Sequencing problems : processing of N jobs through two machines, N jobs through three machines, two jobs through M machines and replacement problem.

CO 4: Probabilistic and cost considerations in project scheduling.

Programme Outcomes (POs) for B.Sc. (Hons.) Mathematics

B.Sc.(Hons.) Mathematics Programme develops:

PO 1: Scientific temperament and attitude among the science graduates

PO 2: The qualities of a science – observation, precision, analytical mind, logical thinking, clarity of thought and expression, systematic approach, qualitative and quantitative decision making are enlarged

PO 3: The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of their choice.

PO 4: This programme trains the learners to extract information, formulate and solve problems in a systematic and logical manner.

PO 5: This programme enables the learners to perform the jobs in diverse fields such as science, engineering, industries, survey, education, banking, development-planning, business, public service, self business etc. efficiently.

Programme Specific Outcomes (PSOs) for B.Sc. (Hons.) Mathematics

PSO 1: Development of Scientific temperament and attitude among the science graduates

PSO 2: To infuse the qualities of – observation, precision, analytical mind, logical thinking, clarity of thought and expression, systematic approach, qualitative and quantitative decision making are enlarged

PSO 3: The Programme will empower the graduates to appear for various competitive examinations or choose the post graduate Programme of their choice.

PSO 4: This Programme would trains the learners to extract information, formulate and solve problems in a systematic and logical manner.

PSO 5: This Programme would enable the learners to perform the jobs in diverse fields such as science, engineering, industries, survey, education, banking, development-planning, business, public service, self business etc. efficiently.

COURSE OUTCOMES
Name of Programme: B.Com. (Hons.)

Semester-I

Paper- BCH-1.01 Statistics

CO 1: Students will formulate complete, concise, and correct mathematical proofs.

CO 2: Help students learning frame problems using multiple mathematical and statistical representations of relevant structures and relationships and solve using standard techniques.

CO 3: Enable students create quantitative models to solve real world problems in appropriate contexts.

CO 4: Enable them make effectively use of professional level technology tools to support the study of mathematics and statistics.

Paper- BCH-1.02 Business Communication

CO 1: Enable students learn the importance of business communication and to understand all aspects of communication.

CO 2: Make students learn the different levels of communication, channels of communication, mode of communication, consequences of miscommunication methods and policies or making verbal and non-verbal, oral and written, online and offline communication effective and productive.

CO3: Enable the students to learn various steps regarding the various types of communication.

CO4: Helps the students how to write the report.

Paper-BCH-1.03 Business Organization

CO1: Will help the students to understand the spectrum of business activity. Contribution of manufacturing and service sectors in Indian economy.

CO 2: Provide the student to understand the concept of globalization, liberalization and privatization.

CO 3: Provide help in enhancing the knowledge of students about BPO , Networking Marketing , E- Commerce and M- Commerce , franchising.

CO 4: Enable the students to understand which steps should be taken while setting up a business enterprise and to achieve the knowledge about benefits and limitations of small enterprises.

Paper- BCH-1.04 Financial Accounting

CO1: Enable the students to differentiate the book keeping and Accounting.

CO2: Understanding the general purposes and functions of accounting.

CO3: Provide knowledge the accounting cycle & various accounting cycle.

CO4: Develop the ability to evaluate the financial results through examination of relevant data.

Paper- BCH-1.05 Fundamental of Economics

CO1: Provide help in enhancing the knowledge of students about the nature of the market influences, consumers, choices, surplus and welfare.

CO 2: It provide help in understanding the concept of Monopolistic Competition and Oligopoly forms of market, their future and impact of their policies.

CO 3: Help students in understanding how firms control market decisions regarding price, output and profit sharing.

CO 4: Enable the students to understand the concept of financial distribution of income with form of rent, interest and profit.

Paper- BCH-1.06 Business Law

CO 1: This course will help the students to demonstrate the relationship between law and Economic activity by developing in the student an awareness of legal principles.
CO 2: Enable the students to develop acceptable attitudes and view points with respect to Business ethics and social responsibility.
CO 3: Enable the students to come in contract according to Sale of Goods act 1930.
CO4: Helps the students to aware from the unfair trade practices by the seller and also provide the information regarding the customer support services.

Semester-II

Paper- BCH-2.01 Financial Management

CO1: Will help the students to understand the nature and purpose of different types of organizations as commercial, voluntary, public sector etc.
CO2: Enable the students to describe the different ways in which organizations may be structured
CO3: Enhance the managerial capabilities in students.
CO4: Make students learn in different types of budgeting techniques, variances & standards.

Paper- BCH-2.02 Business Economics

CO 1: Develop the ability to explain core economic terms, concepts and theories
CO 2: Help the students in understanding theories and principles in micro economics including market structure, consumer theory. Production theory and cost theory.
CO 3: Acquire the necessary quantitative skills used in economic analyses.
CO 4: Will help the students learn how micro economics principles are useful in taking business decision for profit maximization and non-profit maximization objective.

Paper- BCH-2.03 Business Statistics

CO1: Understanding of data collection and data presentation in a effective manner using diagrams, graphs and tables.
CO2: Enable the students to apply different tools on data like averages, partition values, measures of dispersion and moments.
CO3: Help understand the concept of correlation and regression for a data of two variables.
CO4: Helps the students to interpret the data and analysis the data.

Paper- BCH-2.04 Business Management

CO1: Help to understand about classical, new classical and modern management approach which is very helpful for students in understanding the era of management from then to now.
CO2: Impart knowledge to students about planning, corporate strategy , process of managing , techniques of decision making.
CO3: Enhance the knowledge of the students about contemporary organizational formats like matrix and networking.
CO4: Enable the students to understand the significance of motivational theories & become effective leaders.

Paper- BCH-2.05 Business Law

CO1: Enable the students to develop an understanding of the free enterprise system and the legal safeguard principals.

CO2: Inculcate the habits of analytical thinking and logical reasoning as a technique for business law.
CO3: Develop the understanding of the industrial disputes and reasons behind every dispute.
CO4: Will help the students to know and understand the implications and effects of foreign exchange laws in India.

Paper- BCH-2.06 Computer Fundamental

CO 1: Help understand, Identify and analyze computer hardware, software, and network components.
CO 2: Recognize systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems.
CO 3: Make Familiar with software and hardwares of Computer system and the way to install them in the system.
CO 4: Help identifying the categories of computers and basic hardware components.

Semester-III

Paper- BCH-3.01 Business Mathematics

CO1: Help the students in understanding and use of Sets in daily life problems.
CO2: Enable the students to solve complicated arithmetic expressions using log tables.
CO3: Enable the students to arrangement & selection of the data regarding the Permutation and combination, Arithmetic and Geometric Progression in daily life problems.
CO4: Help the students to collect & interpret the data

Paper- BCH-3.02 Corporate Accounting

CO1: Would help in understanding the regulatory environment in which the companies are formed and operate in India.
CO2: Enable the students to prepare the financial statements of a company.
CO3: Encourage the Students to account for a range of advanced financial accounting issues.
CO4: Enable the students to analyze complex issues related issue of shares, debentures and redemption of shares and debentures, to formulate well reasoned and coherent arguments and to reach well considered conclusions.

Paper- BCH-3.03 Cost Accounting

CO1: Will help the students in understanding the concepts of cost and cost accounting.
CO2: Enrich the knowledge of the students regarding the cost determination.
CO3: Encourage the students to pursue accounting in the field of cost.
CO4: Enable the students to calculate the costs of goods as well as services.

Paper- BCH-3.04 Corporate Law

CO 1: Will help the students to know about the basic structure of the company.
CO 2: Enable the students to understand legal process regarding company establishment.
CO 3: Enhance the knowledge about the various investment plan opportunities.
CO 4: Provide help to know about the corporate constitution.

Paper- BCH-3.05 Principles of Marketing

CO1: It would enhance the knowledge of the students regarding marketing mix.
CO2: It would encourage the students to think about the different pricing policies.
CO3: It will infuse the knowledge into the Students regarding the pricing policies and marketing strategies
CO4: Principle Of Marketing would help the students to know about the consumer behavior.

Paper- BCH-3.06 Basic of Information Technology

CO1: Bridge the fundamental concepts of computers with the present level of knowledge of the students.
CO2: Familiarize students with operating systems, programming languages, peripheral devices, networking, multimedia and internet
CO3: Will help the students to understand the basic Concepts of Tally and PPT.
CO4: Familiarize the students Internet addressing.

Semester-IV

Paper- BCH-4.01 Corporate Accounting
CO1: Students will be able to describe the different types of relationships amongst business entities and identify these relationships for financial reporting purposes.
CO2: Determine the 'reporting entities' for each inter-entity relationship, and explain the appropriate accounting policy choices.
CO3: Enable the students to demonstrate a thorough knowledge of relevant accounting standards and the ability to apply them to solve practical problems arising due to inter-entity relationships.
CO4: Provide the appropriate accounting techniques, as prescribed by the relevant accounting standards.

Paper- BCH-4.02 Business Ethics
CO1: Promote understanding of the importance for business and the community of ethical conduct.
CO2: Provide the skills with which to recognize and resolve the ethical issues in business.
CO3: Encourage reflection on ethical dimension of one's own decision-making in workplace and other settings.
CO4: Enable the students to understand the corporate code of ethics.

Paper- BCH-4.03 Corporate Law
CO1: Help the students to understand the relation between Law and Economic activity and use it for their career.
CO2: Inculcate in students a critical appreciation of the important role of corporation and corporate law in modern society
CO3: Help to develop knowledge about meeting and its arrangement in a legal way.
CO4: Enable the students to handle corporate problems, duties, rights and remedies.

Paper- BCH-4.04 Statistics with Ms-Excel
CO1: Will make students understand the key concepts in the field of statistics and MX-EXCEL.
CO2: Will make them become more productive and in their use of excel for business data analysis and reporting
CO3: Enable the students create effectives chart and dashboard in excel for improved data visualization.
CO4: Help in importing data from online and other sources into excel to facilities analysis.

Paper- BCH-4.05 Financial Institution and Marketing
CO1: Describe and learn the role of regulatory bodies in regulating how banks manage their capital.
CO2: Describe and understand the types of equity securities that companies can use to raise equity capital and how these securities can be listed and traded on the Stock Exchange.

CO3: Apply different company valuation techniques to determine share prices.
CO4: Describe the factors that determine the pricing of derivative instruments. Possess the ability to discuss and write about the links between the theory of financial markets and the reports in the financial press.

Paper- BCH-4.06 Auditing

CO1: Will help the students to understand accounting disclosures and reports, identify gaps, manipulations or weaknesses in financial reporting**.**
CO2: Enable students to solve their routine and complex auditing problems in varied businesses.
CO3: Help in analyzing audit evidence with a questioning mind and require remedial action.
CO4: Encourage the students to apply the Code of Ethics for Professional Accountants in undertaking audit processes and expressing audit opinions.

Semester-V

Paper- BCH-5.01 Financial Management

CO1: Enable the students to calculate common investment criteria and project cash flows associated with corporate project evaluation.
CO2: Help the students know how to apply measures of cost of capital and financial leverage to form long term financial policies for business.
CO3: Develop critical thinking and problems solving competencies at both individual and group levels

Paper- BCH-5.02 Investment Analysis

CO1: Students will be able to examine the relationships between returns and risks.
CO2: Enable them to demonstrate knowledge and skills in the core investment concepts, employing analytical tools to value financial securities.
CO3: Will demonstrate critical thinking, analytical and problem solving skills in the context of investment theories and practices.
CO4: Provide analyzing and help in evaluating ordinary shares and fixed income securities, critically analyzing various investment avenues.

Paper- BCH-5.03 Money and Banking

CO1: Enable the students learn the importance of the functions of money and to understand all evils of money.
CO2: Will help the students to understand the flow of money in Indian economy and rest of world.
CO3: Make the students enriched with the study of banking structure.
CO4: Provide the students to understand the concept of employment level, inflation and micro economic stability.

Paper- BCH-5.04 Contemporary issues

CO1: Provide the knowledge about contemporary political, social, legal and environmental issues and values.
CO2: Will help the students to recognize and articulate relationships between different knowledge areas.
CO3: Provide an opportunity to practical critical analysis synthesizing knowledge and applying skills in new context.
CO4: Encourage students to locate evaluate and synthesize information from variety of sources.

Paper- BCH-5.05 Income Tax

CO1: Will help the students to know about various basic concepts used in Income tax Act
CO2: Enable the students to know that how to calculate the income tax under the various heads
CO3: Familiarize the students about deductions under section 80 C TO 80 U
CO4: Make aware of sophisticated knowledge related to tax accounting, rules and regulations and analyze and resolve tax problems.

Paper- BCH-5.06 Entrepreneurship and small scale business

CO1: Enable the students to transform an initial idea into a full fledge business opportunity and effectively communicating this opportunities through a business plan.
CO2: Enhance the knowledge of student about characteristics and components of internal and external business environment.
CO3: Understand different methods to assess the attractiveness of business opportunities.
CO4: Enhance the knowledge of students about opportunity identification and selection.

Semester-VI

Paper- BCH-6.01 Accounting for Management

CO1: Help the students to understand the nature and purpose of different types of organization.
CO2: Provide the students to explain the financial concepts used in making accounting management decision.
CO3: Enable the students use effective communication skills to promote respect and relationship for financial deals.
CO4: Enable the students to identify and analysis complex and financial accounting problems and opportunities in real life situation.

Paper- BCH-6.02 Project Planning

CO1: Students will be able to manage the scope, cost, timing, and quality of the project.
CO2: Help in conducting project planning activities that accurately forecast project cost and quality.
CO3: Encourage the students to demonstrate effective project execution and control techniques.
CO4: Encourage the students to demonstrate a strong working knowledge of ethics and professional responsibility.

Paper- BCH-6.03 Income Tax

CO1: Help in recognizing tax planning opportunities and recommending appropriate Tax – saving strategies.
CO2: Provide help in addressing tax situations for a variety of taxpayers, such as wage earners, salespersons.
CO3: Enable the students to calculate the individual tax liability.
CO4: Enable the students to prepare tax forms for individual.

Paper- BCH-6.04 Human Resource Management

CO1: Make students learn to assess the development, implementation and evaluation of employee recruitment process, and selection and retention plans.
CO2: Will help the students to administer and contribute to the design and evaluation of the performance management programme.
CO 3: Enable the students to analyze the importance of various training methods.
CO 4: Facilitate learning of the industrial relation and industrial unrest.

Paper- BCH-6.05 Business Environment and International Business

CO1: Will help the students to understand the concepts and significance and changing dimension of business environment.

CO2: Help in understanding the economic system, economic planning, government policies and its impact on business.

CO3: Students are expected to enhance their cognitive knowledge of global issues, interpersonal skills with individual from various cultures.

CO4: Enable the students to identify and explain how foreign markets institutions and culture differ from one another.

Paper- BCH-6.06 Retail Management

CO1: Help to identify and understand basic theories, principles, practices and terminology related to each functional area in business.

CO2: Enable the students to understand the ways the retailer uses, marketing tools and techniques to interact with their customer.

CO3: Facilitate comparison and contract different location opportunities and outlines the factor which affects the retail demand in region.

CO4: Encourage the students to recognize carrier opportunities available in the retail business.

Programme Outcomes (POs) for B.Com (Hons.)

After completing 3 years for Bachelor in Commerce (Hons.) Programme, students would gain a thorough grounding in the fundamentals of Commerce and Finance and the outcome will be

PO1: Building a strong foundation of knowledge in different areas of Commerce.

PO2: Developing the skill of applying concepts and techniques used in Commerce

PO3: Inculcating an attitude for working effectively and efficiently in a business environment

PO4: Integrating knowledge, skill and attitude that will sustain an environment of learning and creativity among the students

PO5: Enabling graduates to be capable of making decisions at personal and professional level

PO6: Making them capable of managing the office activities with the help of information technology

PO7: Pursue research in their chosen field of marketing, finance, and HR.

Programme Specific Outcomes (PSOs) for B.Com (Hons.)

PSO1: This Programme would provide well trained professionals for the Industries, Banking Sectors, Insurance Companies, Financing companies, Transport Agencies, Warehousing etc., to meet the well trained manpower requirements.

PSO2: The graduates will get hands on experience in various aspects acquiring skills for portfolio Manager, Marketing Manager, Selling Manager, over all Administration abilities of the Company.

PSO3: After the completion of Programme, students should Possess the knowledge, skills and attitudes to become a Manager, Accountant, Management Accountant, Cost Accountant, Stock Agents, Government jobs etc.

PSO4: Students will have exposure of working independently and in a team through internship training. This course will develop awareness and self-confidence on general issues prevailing in the society.

PSO5: This course would enable students to understand required mathematical, analytical and statistical tools for financial and accounting analysis.

PSO6: This course will develop employability skill and industry interaction. Students will have global outlook on opportunities and challenges in accounting and financial service sector.

This Programme will enrich students with communication skills, ethical values, team work, professional and leadership skills.

PSO7: Students will be able to design, implement domain knowledge for computer Programming.

PSO8: This course will develop human values and professional ethics in the social, moral, spiritual and legal aspects of commerce.

PSO9: This course will nurture students as real professionals and tax practitioners with the knowledge of professional and ethical responsibilities.

B.COM (Computer Application)

Semester-I

Paper- 101 Financial Accounting

CO 1: Enables the students to recognize and understand ethical issues related to accounting profession.

CO 2: Provide knowledge of the accounting cycle and various accounting principles to students.

CO 3: Develop the ability to evaluate financial results through examination of relevant data.

CO 4: Impart knowledge of the role of accounting profession in society and participation in accounting society.

Paper-102 Business Mathematics

CO1: Helps the students in understanding and use of Sets in daily life problems.

CO2: Enable the students to solve complicated arithmetic expressions using log tables.

CO3: Enable the students to arrangement & selection of the data regarding the Permutation and combination, Arithmetic and Geometric Progression in daily life problems.

CO4: Helps the students to collect & interpret the data.

Paper- 103 Business Economics

CO 1: Develop the ability to explain core economic terms, concepts and theories.

CO 2: Will demonstrate the ability to employ the 'economic way of thinking'.

CO 3: Will be able to apply economic theories and concepts to contemporary social issues, as well as formulation and analysis of policy.

CO 4: Enable students to apply the concept of equilibrium to both microeconomics and macroeconomics.

Paper- 104 Business Management

CO 1: Helps the students to apply conceptual learning skills in today's business Environment.

CO 2: Enables the student to understand the concept of management and its functions.

CO 3: Develop the ability to perform managerial functions effectively.

CO 4: Encourage students to seek career in management.

Paper- 105 Computer Fundamental

CO 1: Understand, Identify and analyze computer hardware, software, and network components.
CO 2: Recognize systems development, word-processing, spreadsheet, and presentation software to solve basic information systems problems.
CO 3: Familiar with software's and hardware's of Computer system and the way to install them in the system.
CO 4: Identify the categories of computers and basic hardware components.

Paper-106 Operating Systems and Business Data Processing-I

CO 1: Familiar with functions of operating systems and working of operating system.
CO 2: Knowledge of various process management concepts including scheduling.
CO 3: Recognize Disk Operating System structures. .
CO 4: Understand concepts of memory management including virtual memory and paging.

Semester –II

Paper-201 Financial Accounting

CO 1: Provides increased exposure to fraud and define preventive internal control measures.
CO 2: Impart critical thinking skills to analyze financial data as well as the effects of different financial accounting methods on the financial statement.
CO 3: Enable the students to experience real world learning and application of skills via their internship.
CO 4: Demonstrate an understanding of current auditing standards and acceptable practices.

Paper-202 Business Mathematics

CO 1: Enable students to analyze real world scenarios to recognize when simple and compound interest, annuities, payroll preparation, pricing and depreciation are appropriate, formulate problems about the scenarios, creatively model these scenarios.
CO 2: Enable students to demonstrate the ability to think critically, research, and reason.
CO 3: Will help students to gain the ability to analyze data and draw appropriate statistical conclusions.
CO 4: Will demonstrate an understanding of the common body of knowledge in mathematics.

Paper-203 Business Economics

CO 1: Create awareness of the micro economic tools and their application in business decision making.
CO 2: Will be able to understand the desired objectives of business whether profit maximization or non-profit maximization is achieve effectively in time.
CO 3: Enable students to understand the consumer behavior.
CO 4: Help students to learn about the producers behavior.

Paper-204 Business Management

CO 1: Will be able to understand the classical approach, neo-classical and modern approach.
CO 2: Enable students to learn about various leadership and motivational theories.
CO 3: Enhance the knowledge of the students about contemporary organizational formats matrix and networking.
CO 4: Impart knowledge to students about Planning, Corporate Strategy, Process of Managing, Techniques of decision making.

Paper- 205 Computer Fundamental

CO 1: Familiarize with Master Functions & basic characteristics of computer.

CO 2: Understand about secondary storage devices & updated technology of IT.
CO 3: Recognize the Primary storage devices and know about their uses in computer system.
CO 4: Understand the levels of information & mail merge and latest technologies of Computer.

Paper-206 Operating Systems and Business Data Processing-II

CO 1: Gain the knowledge of data processing system and File management of operating system.
CO 2: Be familiar with the architecture of database system, various keys.
CO 3: Understand the concept of database models and database of Relational Database System.
CO 4: Recognize the concept of database and reports in the MS-Access to store the data of real life applications.

Semester-III

Paper-301 Corporate Accounting

CO 1: Enables student to understand the accounting treatment of issue of shares and issue of bonus shares.
CO 2: Help the students in understanding the regulatory environment in which the Companies are formed and operate in India.
CO 3: Encourage the students to account for a range of advanced financial accounting issues.
CO 4: Develop the ability to analyze complex issues related to profit or loss before and after incorporation.

Paper-302 Business Statistics

CO 1: Enable students to make use of diagram like histogram, bar diagrams, ogive curve in the business field .
CO 2: Develop student's ability to analyze the problem like age groups , based on marks of students .
CO 3: Encourage students to analyze data and draw appropriate statistical conclusions. Students are able to analyze the problems based on two different groups by using moments, kurtosis.
CO 4: Enable students to describe the problems based on assumptions by using probability.

Paper- 303 Business Regulatory Framework

CO 1: Provide a brief idea about the framework of Indian Business Law and the essential provisions of Indian Contract Act 1872.
CO 2: Will understand the meaning and the importance of contingent contracts and the consequences of breach of contract.
CO 3: Impart knowledge of the consumer protection act 1982.
CO 4: Demonstrate recognition of the requirements of the contract agreement.

Paper-304 Corporate Law

CO 1: Enable students to describe the basic rules and concepts of Corporate Law.
CO 2: Help students evaluate corporate problems, identifying appropriate legal obligations Duties, rights and remedies.
CO 3: Develop an awareness of the socio-legal and economic dimensions of modern corporate law.
CO 4: Encourage students to critically appreciate the important role of corporations and corporate law in modern society

Paper-305 Database Management System

CO 1: Understand the basic concepts and applications of database system.
CO 2: Recognise the basics of SQL and can create queries using SQL.
CO 3: Familiar with basic database storage structure and access techniques like file organization, indexing methods including B-tree and Hashing.
CO 4: Identify the logical design of database including E-R Model and normalization approach.

Paper-306 Structured Programming and Computer Graphics

CO 1: Understand how to write input and output routines in c and operators.
CO 2: Recognize the different types of translators such as compiler, interpreter and functions to implement different types of problems.
CO 3: Develop the ability of how to search an element using array with the help of various algorithms like linear search and Binary Search.
CO 4: Enable to identify the concept of input output devices in relation for computer graphics and various applications of computer graphics.

Semester -IV

Paper-401 Corporate Accounting

CO1: Helps in understanding the regulatory environment in which the companies are formed and operate in India.
CO2: Enable the students to prepare the financial statements of a company.
CO3: Encourage the Students to account for a range of advanced financial accounting issues.
CO4: Enable the students to analyze complex issues related issue of shares, debentures and redemption of shares and debentures, to formulate well reasoned and coherent arguments and to reach well considered conclusions.

Paper-402 Business Statistics

CO 1: Enable students to make use of diagram like histogram, bar diagrams, ogive curve in the business field .
CO 2: Will be able to use the mean , median and mode in the field of business.
CO 3: Help students in analyzing data and drawing appropriate statistical conclusions.
CO 4: Encourage students to seek career opportunities in the field of Statistics.

Paper-403 Business Regulatory Framework

CO 1: This course will help the students to demonstrate the relationship between law and Economic activity by developing in the student an awareness of legal principles.
CO 2: Enable the students to develop acceptable attitudes and view points with respect to business ethics and social responsibility.
CO 3: Enable the students to come in contract according to Sale of Goods act 1930.
CO 4: Helps the students to aware from the unfair trade practices by the seller and also provide the information regarding the customer support services.

Paper- 404 Corporate Law

CO 1: Will help the students to know about the basic structure of the company.
CO 2: Enable the students to understand legal process regarding company establishment.
CO 3: Enhancing the knowledge about the various investment plan opportunities.
CO 4: Provide helps to know about the corporate constitution.

Paper- 405 Data Base Management System - II

CO 1: Identify the concepts of Data Processing, RAID and various levels of RAID and ER Model by which students can understand logical design of data base.

CO 2: Recognize the concepts of DSS like characteristics, benefits and limitations and storage structure of database with the help of data warehousing, data mining concepts.
CO 3: Be familiar with security issues of database such as firewall, cryptography, authentication etc.
CO 4: Understand the concepts of MS Access such as how to create table, accessing table and editing records in table and Power Point like creating slides, inserting animations in slides etc

Paper- 406 Structured Programming and Computer Graphics- II

CO 1: Understand how to write input and output routines in c and operators.
CO 2: Evaluate the different types of translators such as compiler, interpreter and functions to implement different types of problems.
CO 3: Recognize how to search an element using array with the help of various algorithms like linear search and Binary Search.
CO 4: Identify the concept of input output devices in relation for computer graphics and various applications of computer graphics.

Semester-V

Paper-501 Taxation laws

CO1: Will help the students to know about various basic concepts used in Income tax Act
CO2: Enable the students to know that how to calculate the income tax under the various heads
CO3: Familiarize the students about deductions under section 80 C TO 80 U
CO4: Exhibits sophisticated knowledge related to tax accounting, rules and regulations and analyze and resolve tax problems.

Paper-502 Cost Accounting

CO1: Will helps the students in understanding the concepts of cost and cost accounting.
CO2: Enrich the knowledge of the students regarding the cost determination.
CO3: Encourage the students to pursue accounting in the field of cost.
CO4: Enable the students to calculate the costs of goods as well as services.

Paper-503 Accounting for Management

CO 1: Encourage students to acquire knowledge and skills relating to the application of Management Accounting concepts and techniques.
CO 2: Provides students with an understanding of management accounting concepts related to the management functions.
CO 3: Enable students to apply management accounting tools for pricing, budgetary Control, Cost Allocation, and performance evaluation.
CO 4: Will learn to co-operate with team members to assume leadership and manage Differences and conflicts.

Paper-504 Financial Management Operations

CO 1: Enable the students to critically evaluate and supervise financial markets for both bank based and market based system.
CO 2: Will be able to make oral presentation at seminars and during case analysis.
CO 3: Enables students to describe the role of a financial planner and the methods employed by them.
CO 4: Helps students to appreciate and understand how financial markets and institution operate

Paper-505 Computer Aided Drafting & Advanced topics in Computer

CO 1: Help students in understanding CAD/CAM product cycle, analyse functions of an Compute Graphics Software and Data Base of computer Aided design
CO 2: Encourage students to illustrate design and applications of Computers for design and various input output devices related with CAD
CO3: Provide the basic concepts of multimedia and transformation tools used in Computer Graphics.
CO 4: Familiarize students with basic concepts of data warehousing concepts such as warehousing definition, architecture, metadata etc.

Paper-506 E-Commerce

CO 1: Will be able understand applications of e-Commerce in various fields .
CO 2: Learn to evaluate e-commerce markets and transactions, including supply chains.
CO 3: Develop the ability of critical thinking, problem-solving, and decision-making skills in evaluating e-commerce technologies.
CO 4: Able to Make ethical decisions related to e-commerce considering laws, privacy, and security.

Semester-VI

Paper-601 Taxation Laws

CO1: Helps in recognizing tax planning opportunities and recommending appropriate Tax – saving strategies.
CO2: Provide helps in addressing tax situations for a variety of taxpayers, such as wage earners, salespersons.
CO3: Enable the students to calculate the individual tax liability.
CO4: Enable the students to prepare tax forms for individual.

Paper-602 Cost Accounting

CO 1: Help students to understand the basic concepts and processes used to determine Product costs.
CO 2: Enable students to evaluate the costs and benefits of different conventional and contemporary costing systems;
CO 3: Will be able to analyze and evaluate information for Cost ascertainment , planning, Control & decision making.
CO 4: Help students to learn about marginal costing and profit planning.

Paper- 603 Financial Management

CO 1: Will help the students to develop the ability to analyze complicated financial problems.
CO 2: Enable the students to work in the field of finance successfully.
CO 3: Will help the students to demonstrate ability of financial management and forecast.
CO 4: Encourage students to acquire research skills, innovation and course in financial management. This course will help the students to increase their added value in the changing environment of global economy.

Paper-604 Auditing

CO 1: Help students to understand the audit process from the engagement planning stage through completion of the audit.
CO 2: Will be able to understand auditors legal liabilities in making a judgment whether auditor might be able to certain parties.
CO 3: Will be able to understand the quality control procedures necessary to ensure that a company assurance engagement is performed.

CO 4: Encourage students to work effectively as part of a team in exploring and resolving Audit issues.

Paper-605 Computer Aided Drafting & Advanced topics in Computer

CO 1. Will help to identify the concepts of Artificial Intelligence, Expert System and Neural Network related to CAD.

CO 2. Will be able to recognize the concepts of hardware & Software Requirement for Auto Cad, Robot Programming methods and various applications of robots in industry.

CO 3. Will be familiar with basic Concepts of Multimedia and its components and virtual reality related to CAD.

CO 4. Will be able to recognize the concepts of Input - Output devices related to Computer Graphics used in CAD.

Paper-606 Information technology in business practical

CO 1: Will be able to apply knowledge of computing and to differentiate between data, Information and knowledge.

CO 2: Understand how to analyze a problem, and use current techniques, skills, tools necessary for computing practice.

CO 3: Enables Students to Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

CO 4: Able to function effectively on teams to integrate IT based solutions into the user environment accomplish a common goal.

Programme Outcomes (POs) for B.Com (Computer Application)

PO1: This Programme could provide well trained professionals for the technology and allied industries to meet the well trained manpower requirements.

PO2: The graduates will get hands on experience in various aspects of information technology viz. software updation, Programme developers, software testing, BPO, web designer.

PO3: The Programme will help the graduates to take up responsibilities in production, testing, designing and marketing in the information technologies and contribute for the growth of industry

PO4: Commerce with computer Application gives a deeper understanding of both Information Technology and Commerce, thereby enabling the budding graduates to pursue careers in either of the two fast-growing areas, viz. IT Industry, Commerce, and Financial sector.

Programme Specific Outcomes (PSOs) for B.Com (Computer Application)

The PSOs will make the graduated able to

PSO1: Give a deeper understanding of both Information Technology and Commerce, thereby enabling the graduates to pursue careers in either of the two fast-growing areas, viz. IT Industry, Commerce, and Financial sector.

PSO2: Develop the skill of applying concepts and techniques used in Commerce

PSO3: Understand, analyze and develop software Programmes in the areas related to system software, multimedia, web design, application Programme, database, graphics and networking for efficient design of technology of varying complexity.

PSO4: Demonstrate that they can present the results of their observations and research in a way that is objective, technically accurate, and legally acceptable.
PSO5: Use effective technology for audio-visual presentations appropriately, viz. PowerPoint, slides, posters, handouts, and transparencies in oral presentations.
PSO6: This Programme will enrich students with communication skills, ethical values, team work, professional and leadership skills.
PSO7: Students will be able to design, implement domain knowledge for computer Programming.
PSO8: This course will develop human values and professional ethics in the social, moral, spiritual and legal aspects of commerce.

COURSE OUTCOMES
Name of Programme: BBA (GEN)

Semester: I

Paper: Business organization- BBAN-101

CO1: Students familiarize themselves with the basic terms of business, organizations and their functions and role in economy.
CO2: Students are made aware about the various forms of Business organizations
CO3: Learn about the concept of Entrepreneurship
CO4: Students come to know about MNCs and various Chambers of Commerce.

Paper: Business Mathematics- BBAN-102

C01: Students get introduced about concept of sets and their basic theorems.
C02: They understand details of the basic concepts of matrices and determinant.
C03: Students gain knowledge about the functions which are of use in different types of methods.
C04: They get details about the concepts of limits and continuity.

Paper: Financial Accounting- BBAN-103

CO1: Students know about accounting practices and recording of transactions in journal
CO2: They learn about Subsidiary and Ledger book posting and how to draft the Final Account and Balance Sheet
CO3: They learn about preparing a Bank Reconciliation Statement and Consignment Account
CO4: Learnt about Joint Venture and Income and Receipt Account Preparation

Paper: Computer Fundamentals- BBAN-104

C01: Student will learn about Computer Architecture.
C02: Student will learn about Operating System and Memory and Type.
C04: They learn the basics of Binary System, Octal System.
C05: Students come to know of the differences between Hardware and Software.

Paper: Business Communication- BBAN-105

CO1: Students grab highly effective communication skills and a sense of confidence.
CO2: They learn about listening, speaking, writing and reading skills
CO3: They also learn to draft various forms of business letters and how to prepare a report, notice, memos and minutes of a meeting
CO4: They learn about presentation skills; how to be more effective while communicating with others either formally or informally.

Paper: Micro Economics for Business decisions- BBAN-106

CO1: Students gain knowledge about the concepts of business economics and its importance in business world
CO2: Students understand the basics of demand analysis, utility analysis and consumer equilibrium
CO3: Students gain complete knowledge about the cost concepts and revenue, concept of rent, interest and wages.
CO4: Students grab theoretical knowledge related to all market structure and their price determination

Semester: II

Paper: Principles of Management- BBAN-201

CO1: Students gain knowledge about the concepts and different theories of Management; evolution of management as a discipline.
CO2: Students understand the importance of planning and how decisions are made in the organizations.
CO3: Students gain complete knowledge about the types of organisations and organisational structures.
CO4: Students grab knowledge related to management by objectives and how it helps in achieving organizational goals.

Paper: Macro Economics- BBAN- 202

CO1: Students are enabled to calculate the components of National Income and analyze the economy in quantitative terms.
CO2: Students can understand the concept of Business Cycle and its phases consisting of conditions of depression, boom, inflation and deflation.
CO3: Students are made aware of the monetary policy and how it differentiates from fiscal policy; the course also elaborates about identifying the tools of monetary policy.
CO4: The macro economy is described and taught using aggregate demand and aggregate supply analysis.

Paper: Computer Applications in Management- BBAN-204

CO1: Students will be able to understand the basic concept of computer its hardware -software and its classification. They will acquire the practical knowledge of networking and wireless connection to implement in real life.
CO2: This course would empower the student to acquire the knowledge of information technology and able to implement in various Internet applications in business, chatting and e-mailing etc.
CO3: Students will learn and understand the Information systems such as MIS, TPS, OAS, DSS, expert systems, executive information systems to implement real life application.
CO4: Students will be able to implement Multimedia applications in business; marketing and advertising; web applications of multimedia.

Paper: Organization Behavior- BBAN-205

CO1: Students will get to know about organization behavior needs and trends with emerging issues prevailing
CO2: Students will learn about personality traits and attitude formation
CO3: Students will understand about learning theories and emotional intelligence

CO4: Students will get to know about organization structure and culture
CO5: Students will know team building and group behavior in organization
CO6: Students will learn to resolve conflict and make negotiation in organization
CO7: Students will acquire knowledge to handle stress in organization

Paper: Business Statistics- BBAN-206

CO1: Students are able to describe the theoretical terms of statistics. Students are familiar to the uses of diagram like histogram, bar diagrams, ogive curve in the business field .
CO2: Students are able to use the mean, median and mode in the field of business. The students are able to analyze the problem like age groups, based on marks of students.
CO3: Students gain the ability to analyze data and draw appropriate statistical conclusions. Students are able to analyze the problems based on two different groups by using moments, kurtosis.
CO4: Students are able to describe the problems based on assumptions by using coefficientt of correlation and regression.

Semester-III

Paper: Cost & Management Accounting - BBAN-301

CO1: Students acquire various concepts of cost and how it is differ from financial accounting.
CO2: Students learn about purchase procedures of raw materials.
CO3: They learn the techniques of controlling labor cost and concepts of cash flow, ratio analysis techniques
CO4: They also learn the role of Budget in economy and what the process of budgeting is.

.**Paper: Marketing Management - BBAN-302**

CO1: Students gain knowledge about the concepts of Marketing and understand Modern Marketing Concept in detail. They get an insight into the Marketing Environment, Consumer Behaviour and how market segmentation is done.
CO2: They learn to know about the development of product, various stages of product life cycle, various strategies of branding and packaging and why do new products fail?
CO3: Students gain complete knowledge about the various Methods of Pricing and Price and Non-Price war and various elements of Marketing Research and Marketing Information System.
C04: Students can acquire knowledge about various concepts of place and sales force decision-channel mix, alternative channel, sales organization etc and about various tools of sales promotion and its importance-Advertisement, personnel selling, publicity.
CO5: They acquire an understanding of the new concepts of marketing: CRM and Supply Chain Management.

Paper: Capital Market - BBAN-303

CO1: Students gain knowledge about the various instruments traded in capital market.
CO2: Students are enabled to identify the primary and secondary market reforms.
CO3: Students gain complete knowledge about types of debt market instruments.
CO4: Students come to know about mutual funds and their types and difference between physical shares and Demat shares.

Paper: Introduction to Information Technology - BBAN-304

CO1: Students learn as to how to start MS-Word and its window.
CO2: Students get knowledge of menu bars,tool bars,status bar.

CO3: Students learn how to create header and footer and are taught about creating mail-merge and macros in MS Word
CO4: Students gain the knowledge about MS-Excel sheet- creating,editing and formatting.

Paper: Environmental Studies - BBAN-305

CO1: Students learn about the basics of environment, what are renewable and non-renewable resources and how to make their optimised use.
CO2: Students get knowledge of the various types of ecosystems and also an insight ito factors, types and ways of controlling environmental pollution.
CO3: Students learn various social issues and their relation with environment like sustainable development, urban problems related to energy, water conservation, rain water harvesting, and watershed management
CO4: Students learn about the various legislative mechanisms to prevent environmental pollution like Environment Protection Act, Air (prevention and control of pollution) Act, Water (prevention and control of pollution) Act, Wildlife Protection Act etc.

Paper: Disaster Management - BBAN-306

CO1: Students acquire knowledge about foundations of hazards, disaster and associated natural phenomena.
CO2: The learn about existing global framework of disasters.
CO3: Gain complete knowledge about disaster management and its impact as in case of floods earthquakes etc..
CO4: Learn about humanitarian assistance before and after disaster; Role of UNO.

Semester: IV

Paper: Financial Management- BBAN-401

CO1: Students gain knowledge about the concepts of financial management
CO2: They learn to know about the acquisition and investment of various types of funds
CO3: Students acquire complete knowledge about the various techniques of capital budgeting decisions
CO4: Students learn about capital structure theories and various sources of long term finances
CO5: Students acquire knowledge about the concept of management of working capital

Paper: Name: Human Resource Management- BBAN-402

CO1: Students get introduced to Concept and vitality of HRM.
CO2: They learn details about basic process under HRM.
CO3: Students learnt about wages and salary administration.
CO4: Students know about importance of health and safety of employees at work.
CO5: Students come to know about different method of settling industrial disputes.

Paper: Business Research Methods- BBAN-403

CO1: Students are enabled to analyze the business problems and to identify appropriate ways to solve the problem.
CO2: Students are made to understand the various types of research designs, sampling and data collection techniques.
CO3: Students learn to formulate clearly defined research questions, use sampling methods, how to use various techniques of data collection and interpretation.
CO4: Students are enriched to formulate and present their own effective research reports.

Paper: Business Law- BBAN-404

CO1: Students gain knowledge about the concepts of Law of Contract.

CO2: They learn to know about the contract of guarantee, types of guarantee, Rights & obligation of creditors.
CO3: Students gain complete knowledge about the various concept of contract of Agency-creation of agency, duties & rights of agents, principal's duties toward agents & third parties, power of attorney.
CO4: Students learn about various elements of sales of contract.
CO5: Students acquire knowledge about the concepts of Negotiable Instruments-meaning, types of negotiable instrument, holder & holder in due course, negotiation of negotiable instrument.
C06: Students procure knowledge about various concepts of Digital signature, Electronic governance, penalties adjudication & offences.
C07: They become well versed with various concepts of RTI act 2005.

Paper: Database Management System- BBAN-405

CO1: Student will learn about basic concepts of database and comparison of file versus database system
CO2: Student will know about database architecture and mapping.
CO3: Student will understand database security.
CO4: Student will know and learn about data warehouse and mining techniques

Paper: Human Rights and Values- BBAN-406

Co1: Students understand human rights, value human rights, and take responsibility for respecting, defending, and promoting human rights.
Co2: Students understand to work together to bring about human rights, justice, and dignity for all.
Co3: Students identify and adopt personal and social values that they can call on to guide their decisions, relationships, work, and life as a whole.
Co4: Students develop a depth of character and a clear sense of their own identity, integrity, and what they believe to be important in life.

Semester: V

Paper: Production &Materials Management- BBAN-501

CO1: Students gain complete knowledge about the production process in organisation.
CO2: Students are acquainted with the various techniques of quality control.
CO3: Students are made aware about the various methods and equipments of materials handling.
CO4: Gain the In-depth knowledge of mechanism for disposal of scrap, surplus and obsolete materials.

Paper: Company Law - BBAN-502

CO1: Students learn about the various acts of Indian company law.
CO2: They learnt about the various important documents required for registration such as MOA, AOA.
CO3: They gain complete knowledge about the shares and debentures
CO4: They acquire an insight about the company administration, various meetings and winding up of the company

Paper: Indian Business Environment- BBAN-503

CO1: Students gain knowledge about the concepts Business Environment and its components and an insight into the Economic Reforms since 1991 and growth of Public and Private Sector.
CO2: Learn to know about the Development and Patterns of Industrial Growth since 1991 and trends in Globalization, Privatization and Liberalization.
CO3: Students gain complete knowledge about the various types of Development Banks and role of SEBI in regulation of Stock Exchanges; various challenges faced by Public Sector Banks and growth of NBFCs.
C04: Students acquire knowledge about Trends and Patterns in Foreign Trade and India's Overseas Investments; role of MNCs, WTO, IMF etc. on Indian Business Environment.

Paper: Computer Networking and Internet- BBAN-504

CO1: Student get knowledge of topplogy of network, type of networks which we use for data communication.
CO2: They learn analog and digital signal used for transmitting data.
CO3: Student learn about various layer of OSI and TCP/IP reference models.When data transmitted on network have to follow protcols.
CO4: They learn how to secure data using cryptography and firewall.

Paper: Presentation Skills and Personality Development- BBAN-505

CO1: Students grab highly effective presentation skills and a sense of confidence.
CO2: They learn about listening and speaking skills.
CO3: Students acquire knowledge about self-awareness and personal development.
CO4: They learn to deal with nerves and think more positively about public speaking and the ways of grabbing the listeners attention, holding their interest and concluding strongly.

Paper: Cyber Security- BBAN-506

CO1: Students get introduced to Concept of Information Society .
CO2: They get details about Critical Infrastructure and also learn about Digital Economy.
CO3: Students know about the concept and uses of ICT; its importance in studies and organizations
CO4: Students learn about Information Security.

Semester-VI

Paper: Income tax - BBAN-601

CO1: Students gain knowledge about the concepts of Income Tax.
CO2: They learn to know about the residential status & tax incidence, income exempted from tax .
CO3: Students gained complete knowledge about the income from salaries, income from house properties, income from profit & gains of business & profession, various elements of income from capital gains& other sources.
CO4: Students acquired knowledge how to set off & carry forward of losses, various concepts of clubbing of income & deduction of tax at source.and rules of deduction from gross total income, assessment of individual etc.

Paper: System Analysis and Designing- BBAN-602

CO1: Students will get knowledge of SDLC (System Development Life Cycle) and various case tool of system.How we done feasilbilty for a project.

CO2: Students get the ability of designing DFD (Data Flow Digram). They will be capable of designing input and output form for organization.
CO3: This course content give knowledge of structured tools like descision tree, data dictionary, descision tables. This will helpful for taking Organization decision.
CO4: Student will know about distributed data processing and state transition diagrams. This will give them knowledge of how database would be maintained in Organization.

Paper: Foundations of International Business- BBAN-603

CO1: By studying international business, students will learn about world cultures and societies, and be challenged to approach issues from different perspectives.
CO2: Students understand an in-depth knowledge of the global practices across the spectrum of business fields.
CO3: Students increase their understanding of global markets and various regions of the world.
CO4: By studying international business, students can prepare for positions across the public, private, and non-profit sectors.

Paper: Consumer Protection- BBAN-604

CO1: This course make understand the students about the Consumer Protection Act ,what different philosophies existed from time to time in the interest of consumers.
CO2: Students learn about the three tier organizational machinery called consumer courts and what are basic provisions of CPA 1986.
CO3: Students gain complete knowledge about the approaches to consumerism; how government and business play role in consumer welfare? They also seek to know the importance of alert consumer and role of media in this regard.
C04: Students acquire knowledge about how information is a tool in the hands of consumers to be safe and role of ethical marketing in consumer protection.

Paper: E-Commerce- BBAN-605

CO1: Students can identify the components and roles of the Electronic Commerce Environment.
CO2: Students are illustrated about how businesses sell products and services online like Amazon, Flipkart and can identify the E-Commerce Payment System such as Credit card, Debit card etc.
CO3: Students are familiarized with Search Engine optimization, online banking, internet banking.
CO4: Students also understand about various Security Issues and legal issues which usually come up in E-Commerce.

Programme Outcomes (POs)
BBA(GEN)

PO1: The students gain exposure to the industrial world by visiting to various manufacturing plants and having an interaction with the experts in the various fields by means of various seminars and workshops.
PO2: One can opt for MBA entrance exams like **CAT, GRE, GMAT, MAT, Symbiosis National Aptitude Test** etc. depending on their choice of institutions.
PO3: This course will make them learn about various business and management practices.
PO4: This course also makes the students learn about various terminologies of banking sectors and their functioning.

Programme Specific Outcomes (PSOs)
BBA(GEN)

PSO1: Irrespective of theoretical knowledge, BBA Programme also includes practical management training followed by a research project submitted by students which can prepare them to successfully work within a large or small organization.
PSO2: The students also gain exposure to the industrial world by visiting to various manufacturing plants and having an interaction with the experts in the various fields by means of various seminars and workshops.
PSO3: One can opt for MBA entrance exams like **CAT, GRE, GMAT, MAT, Symbiosis National Aptitude Test** etc. depending on their choice of institutions
PSO4: Starting up of own business would be a great option for budding entrepreneurs who don't want to work under the other companies and have a zeal of leading the others. This course will make them learn about various business and management practices
PSO5: One can also go for competitive exams like Indian railways, IBPS, SBI and much more. With a graduate degree in BBA, you can easily crack these exams. This course also makes the students learn about various terminologies of banking sectors and their functioning
PSO6: Various foreign embassies require students with a management degree. You can learn a foreign language and go on to work in that particular embassy. You can also take up exams like TOEFL or IELTS and move abroad for further studies.
PSO7: One can pursue any other courses of his/her choice later on like Hospitality or Tourism Management.

COURSE OUTCOMES
Name of Programme: BBA (CAM)

Semester-I

Paper: Conceptual Foundation of Management-BCAMN-101
CO1: Students gain knowledge about the concepts and different theories of Management; evolution of management as a discipline.
CO2: Students understand the importance of planning and how decisions are made in the organisations.
CO3: Enable Students gain complete knowledge about the types of organizations and organizational structures.
CO4: Help students grab knowledge related to management by objectives and how it helps in achieving organizational goals.

Paper: Business Economics- BCAMN-102
CO1: Students gain knowledge about the concepts of business economics and its importance in business world; why it is important for a manager to study Economics.
CO2: Students understand the basic concepts of demand analysis, utility analysis and consumer equilibrium

CO3: Students gain complete knowledge about the cost concepts and revenue.
CO4: Students get theoretical knowledge related to all market structure and their price determination
CO5: Students acquire knowledge about the concept of national income, monetary and fiscal policy.

Paper: Mathematics for Managers- BCAMN-103

C01: Students get introduced about concept of sets and their basic theorems.
C02: They understand details of the basic concepts of matrices and determinant.
C03: Students gain knowledge about the functions which are of use in different types of methods.
C04: They get details about the concepts of limits and continuity.

Paper: Financial Accounting- BCAMN-104

CO1: Students learn about accounting practices and recording of transactions in Journal.
CO2: Learn about Subsidiary and Ledger book posting
CO3: Learn to draft the Final Account and Balance Sheet
CO4: Learn to prepare a Bank Reconciliation Statement and Depreciation Account
CO5: Learn about Inventory Valuation Method and Income and Receipt Account Preparation

Paper: Introduction to Computers- BCAMN-105

CO1: Students understand basic types of computers; how and why studying Computer is necessary for a management student.
CO2: Students get a detailed analysis of components of a computer and various types of software and hardware available.
CO3: Students get an insight of number system including binary, octal, hexadecimal and decimal number system and basic operations in MS Office (Word, Excel and Power point)
CO4: Students understand the use of computer applications in various fields.

Semester: II

Paper: Indian Business Environment- BCAMN-201

CO1: Students gain knowledge about the concepts Business Environment and its components and an insight into the Economic Reforms since 1991 and growth of Public and Private Sector.
CO2: Students learn to know about the Development and Patterns of Industrial Growth since 1991 and trends in Globalization, Privatization and Liberalization.
CO3: Students gain complete knowledge about the various types of Development Banks and role of SEBI in regulation of Stock Exchanges; various challenges faced by Public Sector Banks and growth of NBFCs.
C04: Students acquire knowledge about Trends and Patterns in Foreign Trade and India's Overseas Investments; role of MNCs, WTO, IMF etc. on Indian Business Environment.

Paper: Organization Behavior- BCAMN-202

CO1: Students will get to know about organization behavior needs and trends with emerging issues prevailing
CO2: Enable students learn about personality traits and attitude formation, learning theories and emotional intelligence
CO3: Students will get to know about organization structure and culture, team building and group behavior in organization

CO4: Students will learn to resolve conflict and make negotiation in organization and to handle stress in organization.

Paper: Business Statistics- BCAMN-203

CO1: Students are able to describe the theoretical terms of statistics. Students are able to the uses of diagram like histogram, bar diagrams, give curve in the business field.

CO2: Students are able to use the mean, median and mode in the field of business. The students are able to analyze the problem like age groups, based on marks of students.

CO3: Students are enabled to gain the ability to analyze data and draw appropriate statistical conclusions. Students are able to analyze the problems based on two different groups by using moments, kurtosis.

CO 4: Students are able to describe the problems based on assumptions by using coefficients of correlation and regression.

Paper: System Analysis and Design- BCAMN-204

CO1: Students will learn to explain and apply systems development methodologies, models, tools and techniques for developing quality software.

CO2: Help analyze, design, implement and evaluate computerized solutions to real life problems, using appropriate computing methods.

CO3: Help apply techniques of software validation and reliability analysis to the development of computer programs

CO4: Students will learn about implementation, software testing and deployment techniques.

Paper: Operating System & Networking- BCAMN-205

CO1: Students will know about History of Operating System and its types and will get knowledge about working of file system.

CO2: Students will learn about device drivers and able to use UNIX.

CO3: Students will learn about programming languages and its tools.

CO4: Students will get knowledge of Networking. They will also understand the concept of network devices and their working.

Paper: Cost & Management Accounting- BCAMN-206

CO1: Students acquire various concepts of cost and how it is differ from financial accounting.

CO2: Students learn about Purchase Procedures of raw materials.

CO3: They learn the techniques of controlling labor cost and concepts of Cash flow, Ratio analysis techniques

CO4: They also learn the role of Budget in economy and what the process of budgeting is.

Semester: III

Paper: Human Resource Management- BCAMN-301

CO1: Students got introduced to Concept and vitality of HRM.

CO2: They got details about basic process under HRM.

CO3: Students learnt about wages and salary administration.

CO4: Students know about importance of health and safety of employees at work.

CO5: Students learn about different method of settling industrial disputes.

Paper: Financial Management- BCAMN-302

CO1: Students will gain knowledge about the concepts of financial management

CO2: They would learn to know about the acquisition and investment of various types of funds
CO3: Students will acquire complete knowledge about the various techniques of capital budgeting decisions
CO4: Students learnt about capital structure theories and various sources of long term finances
CO5: Students will attain knowledge about the concept of management of working capital

Paper: Marketing Management- BCAMN-303

CO1: Students gain knowledge about the concepts of Marketing Management
CO2: Learn to know about the concept of marketing mix-Product, Price, Promotion, Place, Packaging.
CO3: Students gain complete knowledge about the various Methods of pricing/ Pricing decisions
CO4: Students know about various elements of marketing research; how marketing research is conducted by organization.
CO5: Students acquire knowledge about the concepts of International M; Strategies for entry in international markets.

Paper: Production Management- BCAMN-304

CO1: Students gain knowledge about the concepts of production management
CO2: Learn to know about the various decision and various types of production systems
CO3: Students gain complete knowledge about the various techniques of location analysis
CO4: Students learn production planning control and material management with quality issues
CO5: Acquire knowledge about the concept of inventory valuation and store management

Paper: Internet Technology- BCAMN-305

CO1: Students learn about basics of computer networking
CO2: Students understand client server architecture; Basics of Internet and ISP
CO3: Students have an insight of making Email and the basics of protocols such as HTTP, FTP, TCP/IP
CO4: They understand enterprise collaboration system and tools and techniques of web designing

Paper: Disaster Management - BCAMN-306

CO1: Students acquire knowledge about foundations of hazards, disaster and associated natural phenomena.
CO2: Learn about existing global framework of disasters.
CO3: Gain complete knowledge about disaster management and its impact as in case of floods earthquakes etc.
CO4: Learn about humanitarian assistance before and after disaster; Role of UNO.

Semester: IV

Paper: Public Relation Management- BCAMN-401

CO1: Students gain knowledge about the concept of Public Relations and why it is so important in modern organizations; role of communication is huge in public relations and so significance of formal and informal communication is also taught to the students.
CO2: Students learn to know about the similarities and differences between PR and Advertising, and how house journal play a vital role in PR.

CO3: Students gain complete knowledge about how Public Opinions are formed about a particular organization and its product and also how does these opinions influence an organization in its growth.

C04: Students acquire knowledge about how PR is undertaken in public companies, how does it influence parliamentary committees and how role plays and seminars influence PR activities.

Paper: Quantitative Application to Managerial Decision Making- BCAMN-402

CO1: Helps developing a general understanding of the operational research approach to decision making

CO2: Students gain knowledge about the concepts of mathematical models and their application

CO3: Learn to know about various transportation and transshipment problems on the basis of which faster decisions can be taken

CO4: Students acquire complete knowledge about the various techniques of assignment through which better solution can be provided to the real time problems

CO5: Students learn and use game theories and queuing theories

Paper: Database Management System- BCAMN-403

CO1: Student will learn about basic concepts of database and comparison of file versus database system

CO2: Student will know about database architecture and mapping.

CO3: Student will acquire knowledge about database security.

CO4: They will learn about data warehouse and mining techniques

Paper: Multimedia- BCAMN-404

CO1: Students will learn about basic multimedia applications and how to use continuous media such as audio and video in real life applications.

CO2: Students will able to understand multimedia graphics presentation, researching information from the Internet and other library sources, taking and editing photographs, creating a layered image for publishing, creating an advertisement, creating a business brochure, creating a cartoon , creating website, and creating an animated movie.

CO3: Students understand DVI technology and its applications.

CO4: Students will learn about multimedia hardware and software and how to use them to create graphic presentations.

Paper: Business Research Methods- BCAMN-405

CO1: Students are enabled to analyze the business problems and to identify appropriate ways to solve the problem.

CO2: Students are made to understand the various types of research designs, sampling and data collection techniques.

CO3: Students learn to formulate clearly defined research questions, use sampling methods, how to use various techniques of data collection and interpretation.

CO4: Students are enriched to formulate and present their own effective research reports.

Paper: Human Rights and Values- BCAMN-406

CO1: Students understand human rights, value human rights, and take responsibility for respecting, defending, and promoting human rights.

CO2: Students understand to work together to bring about human rights, justice, and dignity for all.

CO3: Students identify and adopt personal and social values that they can call on to guide their

decisions, relationships, work, and life as a whole.

CO4: Students develop a depth of character and a clear sense of their own identity, integrity, and what they believe to be important in life.

Semester: V

Paper: Business Policy and Strategic Management- BCAMN-501

CO1: Students gain knowledge about the concepts and elements of business policy; its functions in business world.

CO2: Students understand about the analysis of environment and its relation with enterprises; SWOT analysis and various other models

CO3: Students gain complete knowledge about the case studies and how it is an important tool of planning.

CO4: This course develops the student's ability to think strategically.

Paper: Mercantile Law- BCAMN-502

CO1: Students learn about company features and types of company and how it is formed.

CO2: Students learn about Indian contract act 1872 and valid requisites for a contract

CO3: Gain knowledge about sales act 1930 and its various terminologies and about factory act 1948 and its provision

CO4: Students learn about information regarding consumer protection act 1986 and consumer rights

Paper: Consumer Behaviour- BCAMN-503

CO1: Students gain knowledge about the concept of Consumer Behaviour and understand its applications in detail; also an insight into the concept of Lifestyle and Psychographic Segmentation.

CO2: Learns about the environmental influences on Consumer Behavior; Role of Culture and Reference Groups; how family is a major determinant in the process

CO3: Students learnt about various Individual determinants of Consumer Behaviour such as Personality and Self Concept Attitudes and Learning, Memory etc.

CO4: Will create understanding of the Consumer Decision Process and Purchase and Post Purchase Behavior; the concept of Cognitive Dissonance.

Paper: RDBMS- BCAMN-504

CO1: Students learn about relational database and data models, relation database and its creation using rules.

CO2: Students learn about the ER diagram and EE-R diagram.and acquire knowledge of ER symbols.

CO3: Students learn about database languages and how to create database ,different commands in SQL for creating and manipulating database.

CO4: Students get knowledge of MY SQL Server, design relational database and also to get knowledge of ERP (Enterprise Resource Planning).

Paper: Software Engineering- BCAMN-505

CO 1: The subject develops skills in software development so as to enable the BCAM graduates to take up self-employment in Indian & Global software market.

CO2: It teaches to analyze, design, implement and evaluate computerized solutions to real life problems, using appropriate computing methods and as to how to apply techniques of software validation and reliability analysis to the development of computer programs

CO3: The students are trained to meet the requirements of the Industrial standards

CO4: The salient features of the course include emphasis on enhancing the student's soft skills and Identify, explain and apply fundamental software technique and Proficiency in the basic software testing techniques

Paper: Cyber Security- BCAMN-506

CO1: Students get introduced to Concept of Information Society .

CO2: They get details about Critical Infrastructure and also learn about Digital Economy.

CO3: Students know about the concept and uses of ICT; its importance in studies and organizations

CO4: Students learn about Information Security.

Semester: VI

Paper: Entrepreneurship Development Program- BCAMN-601

CO1: Students gain knowledge about the concepts of Entrepreneurs and Entrepreneurship. They seek to know the contribution of entrepreneurship in the development of any economy.

CO2: Students learn to know about the various prominent traits of the entrepreneur and how does he function in an economy. They also learn about the various myths that prevail in relation to entrepreneurs and entrepreneurship.

CO3: Students gain complete knowledge about how government supports entrepreneurship,vrious schemes and incentives available in the country that promotes entrepreneurship

C04: Students acquire knowledge about how business plans are made; feasibility studies and how demand and market surveys are conducted

Paper: International Business- BCAMN-602

CO1: By studying international business, students will learn about world cultures and societies, and be challenged to approach issues from different perspectives.

CO2: Students understand an in-depth knowledge of the global practices across the spectrum of business fields.

CO3: Students increases their understanding of global markets and various regions of the world.

CO4: By studying international business, students can prepare for positions across the public, private, and non-profit sectors.

Paper: Distributed Database Management System- BCAMN-603

CO1: Student will learn about basic concepts of database and comparison of file versus database system

CO2: Student will learn about database architecture and mapping.

CO3: Student will know about database security.

CO4: Student will understand data warehouse and mining techniques

Paper: E-Commerce- BCAMN-604

CO1: Students can identify the components and roles of the Electronic Commerce Environment.

CO2: Students are illustrated about how businesses sell products and services online like Amazon, Flip kart and can identify the E-Commerce Payment System such as Credit card, Debit card etc.

CO3: Students are familiarized with Search Engine optimization, online banking, internet banking.

CO4: Students also understand about various Security Issues and legal issues which usually come up in E-Commerce.

Paper: Programming In Visual Basic- BCAMN-605

CO1: Students learn about fundamentals of visual basic programming.
CO2: Students gain knowledge on designing form using different controls.
CO3: Students know about manipulating objects and working with files.
CO4: Students gain understanding on using graphics in designing forms in visual basic.

Programme Outcomes (POs) BBA (CAM)

PO1: The students gain exposure to the industrial world by visiting to various manufacturing plants and having an interaction with the experts in the various fields by means of various seminars and workshops.
PO2: One can opt for MBA entrance exams like **CAT, GRE, GMAT, MAT, Symbiosis National Aptitude Test** etc. depending on their choice of institutions
PO3: This course will make them learn about various business and management practices.
PO4: This course also makes the students learn about various terminologies of banking sectors and their functioning

Programme Specific Outcomes (PSOs) BBA (CAM)

PSO1: The students gain exposure to the industrial world by visiting to various manufacturing plants and having an interaction with the experts in the various fields by means of various seminars and workshops.
PSO2: One can opt for MBA entrance exams like **CAT, GRE, GMAT, MAT, Symbiosis National Aptitude Test** etc. depending on their choice of institutions
PSO3: Starting up of own business would be a great option for budding entrepreneurs who don't want to work under the other companies and have a zeal of leading the others. This course will make them learn about various business and management practices
PSO4: One can also go for exams like Indian railways, IBPS, SBI and much more. With a graduate degree in BBA, you can easily crack these exams. This course also makes the students learn about various terminologies of banking sectors and their functioning
PSO5: Various foreign embassies require students with a management degree. You can learn a foreign language and go on to work in that particular embassy. You can also take up exams like TOEFL or IELTS and move abroad for further studies.
PSO6: One can pursue any other course of his/her choice later on like Hospitality or Tourism Management.

COURSE OUTCOMES
Name of Programme: B.C.A

Semester-I

Paper- BCA-101 Computer& Programming Fundamentals

CO1: Students will understand the fundamental concepts of computer like basic components of computer, classifications of computers, generation of computer.

CO 2: Students will learn to demonstrate different types of Operating systems and their applications in real world. Identify and analyze computer hardware, software.

CO 3: Students will be able to understand different types of computer languages and how write a simple assembly language,

CO 4: Make students understand the concepts of protocols, network interfaces and design .Performance issues in local area networks and wide area networks, and familiar with wireless networking concepts and its applications.

Paper- BCA-102 PC Software

CO 1: Students will understand the fundamental concepts of computer like basic components of computer, basics of windows, managing files and folders, how to use the control panel.

CO 2: Students will get introduced to word processing interface, creating and editing documents, advance features of ms-word.

CO 3: Students will be able to understand electronic spreadsheet using ms-excel, basics of ms-excel, formulas and functions, advanced features of ms-excel like pivot table, pivot chart, database management using excel.

CO 4: Students will understand the concepts of Presentation in MS-Power Point, creating manipulating and enhancing the slides.

Paper III BCA-103 Mathematics

CO 1: Students are able to apply set theory in real life scenarios

CO 2: They are able to solve equations with the help of matrices and determinants. Further with help of this they have gained knowledge about input output model

CO 3: With the help of differentiation they are able to model out average revenues, marginal revenue, Maximization and minimization cost.

CO 4: Students will gain knowledge about higher order derivatives and constrained optimization

Paper- BCA-104 Logical Organization of Computer-I

CO 1: This course will teach the students decimal, binary, octal and hexadecimal number systems including computer arithmetic. Students will also expertise in different types of codes like BCD code, Error Detection and Correction Code, ASCII and Unicode.

CO 2: Students will know about Boolean algebra. Boolean Theorems and Postulates. They will know about the Venn diagrams and K- MAP method to simplify the Boolean Expression and use it in daily life also.

CO 3: This course introduces the topic of logic gates including Universal Gates, XOR gate, X-NOR Gate etc. Students will also know about combinational logic, their characteristics their design and multilevel NAND and NOR implementation. Use Boolean algebra as related to designing computer logic, through simple combinational and sequential logic circuits.

CO 4: After the completion of this topic, students will learn about the combinational circuits like adders, subtractions, Encoder, Decoder, Multiplexer, De-multiplexer, Comparators and Code Convertors and their real life application.

Paper: BCA-105 Practical software Lab – Based on paper BCA-102 i.e. Word, Excel and Power Point

CO 1: Students will understand the basic operations of a computer like how to manage files and folders and how to create shortcuts, using the control panel etc.

CO 2: Students will get understand the MS-Office.

CO 3: Students will get introduced with MS-word and its various features.

CO 4: Students will understand the basics concepts of MS-excel and how to use the various advanced features of ms-excel like: pivot table, pivot chart, linking and embedded objects, and Database Management in Excel.

Semester –II

Paper- BCA-106 'C' PROGRAMMING

CO 1: Students will understand the basics of 'C' Programming language, like history of 'C', development of 'C', syntax of 'C'. They will also learn about the strength of 'C'.

CO 2: Students will learn about decision making and branching statements. They also learn about how to use different looping, and branching statements in different situations.

CO 3: Students will learn about the usage of system functions. They also learn about how to create user functions as per the requirement of user to solve a specific problem.

CO 4: Students will understand array, pointer, and string concepts. How they are created and used. They will be comfortable in Programming fundamentals like algorithms and flowcharts.

Paper- BCA-107 LOGICAL ORGANIZATION-II

CO1: Students will know about the operation of electronic logic elements. They will get the ability to design various digital circuits.

CO2: Students will get the ability of analyzing and designing of sequential circuits and registers. Understand various types of digital circuits and their working principles.

CO3: Students would understand the System Memory. How different type of memory used and their uses in electronic devices. They will familiarize with various inputs -output devices and how these devices are controlled using electronic circuit.

CO4: Students will get the ability to understand instructions sets and how different computer architecture are designed. How instruction cycle works and instruction get executed. They understand how data transfer take place between I/O devices and how we can use different technique of data transfer.

Paper- BCA-108 MATHEMATICS

CO 1: Students are able to use the mean, median and mode in the field of business , banks works. The students are able to analyze the problem like age groups , based on marks of students .

CO 2: Students are able to describe the problems by algorithms with the help of different steps.

CO 3: Students have gained the ability to analyze data and draw appropriate statistical conclusions. Students are able to analyze the problems based on two different groups by using trees and recursion.

CO 4: Students are able to describe the different problems in different fields with the help of number theory.

Paper BCA-109 Structured System Analysis and Design

CO 1: Students will understand the concept of system development life cycle and familiar with the system planning and initial investigation.

CO 2: This course would empower the student to learn the concept of structured analysis and their tools. They will understand the feasibility and cost benefits of system analysis.

CO 3: Students will illustrate Design Methodologies. Students will be able to construct input, output and form design for the system layout.

CO4: Students will acquire knowledge of System testing to rectify the errors in the system. They will evaluate the system their maintenance and also able to prepare the efficient documentation of the system.

Paper- BCA-110 Practical Software lab based on BCA-106 'C' Programming

CO 1: Students will learn the structure of 'C' Programs. They will also learn the syntax and semantics of 'C' Programming. They will also learn to create basic programs in 'C' Language.

CO 2: They will be able to use FOR, WHILE, DO WHILE loops. They would use Branching statements like IF, IF- ELSE, SWITCH statements.

CO 3: They would practically implement 'C language in built Mathematical Functions, Formatted and Unformatted Functions. They will also learn to create user defined functions in 'C'.

CO 4: They will learn to create and use arrays, strings and pointers. They will be able to implement these concepts practically.

Semester –III

Paper-BCA-201 Introduction to Operating System

CO 1: The students would be enabled to understand the concepts of processes in operating system and understand the concept of threads and inter-process communication

CO2: They get the ability of analyzing Scheduling algorithms and Deadlock and method of handling deadlocks.

CO3: Students get the ability to understand memory management techniques, concept of virtual memory, paging and page replacement.

CO4: Students get the ability to understand File system and its implementation. They understand the concept of allocation methods and disk scheduling

Paper-BCA-202 Data Structures – I

CO 1: Students would be able to understand the basics of Data Structures. They will be aware about different Data Structures, their operations, their organizations. They will also be able to calculate the complexity of different algorithm. They will be able to use string and string algorithms.

CO 2: Students will learn about Array and Linked List data structure. They will be able to create and operate these data structures

CO 3: Students will know about Stack and Queue Data Structure. Various algorithms to create, modify and delete operations will be used by students.

CO 4: Students will aware about the basics of hierarchical data structures like Tree and Graph. They will learn to operate these data structures.

Paper-BCA-203 Introduction to database system

CO 1: Students will be able to analyze database design methodology and able to master the basic concepts and understand the application of database system.

CO 2: Students will be familiar with the architecture of database system, distinguish between centralized and client server architecture and understand the concept of data models.

CO 3: Students will demonstrate and Design ER-models to represent simple database application scenarios and able to convert the ER-model to relational tables and populate relational database.

CO4: Students will acquire knowledge to analyze & apply the principle of database normalization and able to construct structure query language to implement various operations like create, update, retrieve and delete on database.

Paper- BCA-204 Communication skills (English)

CO1: It guides students on professional path. It helps to write detailed business reports, minutes of meeting.

CO 2: It helps students to understand professional obligation. It helps to improve grammar skills of the students.

CO 3: It enables students to plan and manage business projects and communication strategy. It enables students to conduct effective business research and communication process and findings in a range of business documents and oral communication.

CO 4: It helps in utilizing constructive negotiation and conflict management skills. It improves communication skills of the students and helps them in facing interviews.

Paper- BCA-205 Practical software Lab Based on paper BCA-202 & 203 using C Language and SQL

CO 1: Students will learn to create various Data structures using STRUCT statement. They will also learn to use Data Definition Language using SQL.

CO 2: Students will learn to create ARRAY and LINKED LIST. They will also learn to use and manipulate this Data Structure. They will also learn to use Data Manipulation Language using SQL.

CO 3: Students will learn to create STACK and QUEUE. They will also learn to use and manipulate this Data Structure. They will also learn to use Data Control Language using SQL.

CO 4: Students will learn to create TREE and GRAPH. They will also learn to use and manipulate this Data Structure. They will also learn to use Transaction Control Language using SQL.

Semester –IV

Paper- BCA-206 Web Designing

CO1: The course would give student the knowledge of internet and WWW.Students will be able to know how to work on different internet tools like E-mail, FTP, and Gopher.

CO2: Students understand the concept of designing and hosting web site. They get idea of security issue while designing web site.

CO3: Students would know about Web Development by using HTML. They get capable of using HTML tag for web designing.

CO4: They will understand the concept of using various web designing Languages like HTML, DHTML,JSSS .They will be able to develop a effective web site using various attributes and layout techniques.

Paper- BCA-207 Data Structure – II

CO 1: Students will get the advance knowledge of Tree data structure. They will know about various types of Trees can be implemented. They will learn about various operations that can be performed on trees.

CO 2: Students will become able to use Graph data structure. They will be aware about different types of graphs and operations that can be performed on graphs.

CO 3: They would be able to perform different Sorting and Searching techniques.

CO 4: They will be introduced about various file structure and operations performed on different types of files.

Paper-BCA-208 Object Oriented Programming using C++

CO1: Students understand the basic concept of OOP (Object Oriented Programming), data types of OOP.

CO2: Students would know about constructor and destructor. They get knowledge of how to develop programs by use of constructor and Destructor.

CO3: This course content empowers the students to acquire the skill of inheritance and its implementation.

CO4: They understand the concept of Exception handling, Template and their implementation.

Paper I BCA-209 Software Engineering

CO 1: The course contents will help the students to understand the basic principles of Software Engineering. They will be able to define various software applications domains and their development process.

CO 2: This course would give the students thorough understanding of the techniques for software development including requirement analysis, design, implementation, testing and maintenance.

CO3: The methods and tools will help the students attain problem solving approach towards software development.

CO4: The course will give the students detailed understanding of a complete cycle of a software development project.

PAPER- BCA-210 Practical software Lab– Based on paper BCA206 & 208, i.e. HTML and C++ Programming

CO1: Students will get skills of using HTML Tags. They would get the ability of design web site for organization.

CO2: By using other web designing techniques like CSS, JSSS, DHTML they will get the scope of web developer.

CO3: Students will get knowledge of using C++ constructs for making program of OOP (Object Oriented Programming). They get knowledge of how to develop programs by use of C++ concepts like constructor, destructor, friend function.

CO4: They will get familiarized with designing and implementation of function overloading, Polymorphism, Virtual function, Templates and Exception Handling.

Semester-V

Paper-BCA-301 Management information system

CO 1: The course would help the students to understand the system and its types, and role of information and EDP in system and in decision making in industry.

CO 2: This course would empower the student to understand the MIS framework, Management Levels, Decision making model and its types and apply them in actual use of practical applications especially in industry

CO 3: The basic theoretical principles of information system will help the students to design information system and how to implement and evaluate information system in Industry.

CO 4: This course will help students to understand Decision Support system and how to take implement it in Industry. The student will learn ecommerce technologies and its benefit in Financial and Production MIS.

Paper-BCA-302 Computer Graphics

CO1: This course content caters to the need of graphics in real world and enable the students to scan convert the basic graphic primitives.

CO2: This course would empower the students to acquire the skills of geometric transformations like rotation scaling, reflection, shearing etc and would enable them for viewing transformations.

CO3: 3D object representation would enable the students to demonstrate the real world curve objects into graphical form in systems.

CO4: The students would be able to learn 3D geometric transformation & understand how to clip 3d objects and project the 3D object into 2D scenario.

Paper BCA-303 Data Communication and Networking

CO 1: Students will understand the fundamental concepts of data communications and networking, identify different components and their respective roles in a computer communication system, understand and be able to explain the principles of a layered protocol architecture.

CO 2: Students will be able to understand concept of analog and digital communication in networking. Students will be able to recognize various merits and demerits of modulation techniques and how data is transferred using guided and wireless transmission media. Also learn how do satellites communicate.

CO 3: Students will be able to understand various flow control and error control techniques.

CO 4: Students will be able to understand and explain the principles and protocols of shortest route determination for data communication in a network. Also learn various strategies for securing network applications.

Paper BCA-304 Visual Basic

CO 1: Students will able to understand & demonstrate the working of Integrated Development Environment of visual basic by using various control structure and also distinguish the event driven programming with other programming languages.

CO 2: Students acquire the knowledge to design &analyze various I/Ocontrols and efficient use of operators, variables and constants to write the coding easily.

CO 3: Students will demonstrate knowledge of decisions (if, if-else…), looping (for, while, do-while…) and learn to implement arrays and collections available in VB to solve problems.

CO4: Students will practically apply forms and menus in the program to develop the window applications in visual programming and enhanced their skills to implement real life applications.

Paper BCA-305 Practical Software Lab– Based on paper BCA-304 i.e. Visual Basic

CO 1: Students will get introduced to programming in Visual Basic. Students will get introduced with Variables, types of variables, operators and controls in VB.

CO 2: Students will understand the concept of Decision and condition statements in VB.
CO 3: Students will understand the concept of functions in VB. Students will understand the Menus in VB.
CO 4: Students will able to learn the basic concept Computer Graphics.

Semester-VI

Paper BCA -306 E-Commerce

CO 1: The course would help the students to understand the Ecommerce and its applications in Market and selling, its obstacles and future of ecommerce.
CO 2: This course would empower the student to understand the Value Chain in E-commerce and security threat to ecommerce.
CO 3: The basic theoretical principles of E-commerce Security will help the students to design Security system and how to implement Security in E-commerce.
CO4: This course will help students to understand Electronic Documentation system and How to take implement it in Industry. The student will learn ecommerce technologies.

Paper BCA-307Object Technologies & Programming using Java

CO1: The course content would cater to the needs of OOPS while programming and aware the students about various application areas of OOPS.
CO2: This course would empower the students for implementing various OOPS features like Inheritance, Polymorphism
CO3: The course content would enable the students to reuse something which is already build and masteries' them to fix the exceptions.
CO4: The basic idea behind the course content would enable the students for multiprogramming and run multiple processes at one go along with I/O handling.

Paper - BCA-308 Artificial Intelligence

CO 1: This is an introductory course on Artificial Intelligence. The course will help the students appreciate the importance of Artificial Intelligence in the field of Computer Science and understand the intelligent agents in machines.
CO 2: Students will be able to define problems using state space representation and apply different heuristic search techniques over them for solving the problems
CO 3: The course will help the students in representing knowledge using various approaches
CO 4: Students will be able to understand concepts used in Natural Language Processing and also the Learning techniques used by machines.
CO5: The course gives insight of working of Expert Systems and students will understand the knowledge representation in specific domains.

Paper –BCA- 309 Introduction to .Net

CO1: Student will understand the framework of MS .Net, components and their architecture to evaluate web based applications.
CO2: This course would empower the concepts of class libraries in .Net and familiar with the C# basics such as data types, variables and constants to efficiently writing the code.
CO3: Students will learn the efficient use of operators, expression and control structure in c# to develop the applications.
CO4: Students will be able to construct the applications various OOPS features like Inheritance, Polymorphism, constructor and destructor to developed real life applications in industry.

Paper –BCA- 310 Practical software Lab– Based on paper BCA-307 & 309 using Java & .net

CO 1: Students will learn the structure of .Net Programs. They will also learn the syntax and semantics of 'C#' Programming. They will also learn to create basic programs in 'C#' Language.
CO 2: They will be able to implement inheritance, polymorphism and I/O files programs in C# language to developed applications.
CO 3: They would practically implement Basic programs in Java language. They will also learn to create Interface in Java..
CO 4: They will learn to create and use I/O directories and files to store real life applications data in Java. They will be able to implement these concepts practically in industry.

Programme Outcomes for BCA Graduates

PO 1: Provide sound academic base for an advanced career in Computer Applications, develop conceptual grounding in computer usage and introduce the organization of a computer and its principal components.
PO 2: Equip students with the latest technology, tools and applications in IT and to meet the ever-growing requirement of IT professionals.
PO 3: Demonstrate the ability towards technological changes and innovations in the discipline.
PO 4: Enable students to analyse implement and evaluate computerized solutions to real life problems, using appropriate computing methods.
PO 5: Provide proficiency in the basic mathematics employed in computer science, differentiate among essential data structures used in computer Programming, and explain how they work.
PO 6: Gain knowledge of algorithms and their role in computer science; identify fundamental structured Programming techniques; utilize important data structures and associated algorithms in the development of computer Programmes.
PO 7: Develop computer Programmes using functional Programming and object-oriented Programming paradigms; apply techniques of software validation and reliability analysis to the development of computer Programmes.
PO 8: Demonstrate the critical thinking and communication skills; create awareness of public health hazards and environmental policies; assure the dignity of the individual and the unity and integrity of the nation.
PO 9: Instil in the students a healthy respect for the rich diversity in Indian society and culture.

Programme Specific Outcomes (PSOs) for BCA

Bachelor in computer applications (BCA) gives a number of opportunities to individuals to go ahead and shine in their lives.

PSO1: Focuses on preparing students for roles pertaining to computer applications and IT industry such as Software Developer, System and Network Administrator, Web Designer, Faculty for Computer Science and Applications.
PSO2: Develop Programming skills, networking skills, problem solving skills and learning latest techniques of IT.

PSO3: Give ability to use innovative tools, techniques and skills necessary for developing multidisciplinary projects.

PSO4: Students would train proficiency in designing and using algorithms, data structures/management, and software design, concepts of Programming languages and computer organization & architecture for solving problems in real time situations

COURSE OUTCOMES
Name of Programme: B.A. (Hons.) Economics

Semester-I

Paper: 1.1 Indian Economy

CO1: Develop ideas of the basic characteristics of Indian economy, its potential on natural resources.

CO2: Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development.

CO3: Grasp the importance of planning undertaken by the government of India, have knowledge on the various objectives, failures and achievements as the foundation of the ongoing planning and economic reforms taken by the government.

CO4: Understand agriculture as the foundation of economic growth and development, analyze the progress and changing nature of agricultural sector and its contribution to the economy as a whole.

Paper: 1.2 Micro Economics

CO 1: Students will aware of the micro economic tools and their application in business decision making.

CO 2: They will be able to understand the desired objectives of business whether profit maximization or non-profit maximization is achieve effectively in time.

CO 3: Student will be able to understand the consumer behaviour.

CO 4: After completing this course students will learn about the producers behaviour and market structure.

Paper: 1.3 Mathematics for Economic Analysis -I

CO 1: Students are able to apply set theory in real life scenarios

CO 2: They are able to solve equations with the help of matrices and determinants. Further with help of this they have gained knowledge about input output model

CO 3: With the help of differentiation they are able to model out average revenues, marginal revenue, Maximization and minimization cost.

Co 4: Students have gained knowledge about higher order derivatives and constrained optimization

Paper: 1.4 Sociology

CO 1: Students will understand the nature and scope of sociology and its relations with other social sciences.

CO 2: Students will be able to understand the basic concepts of sociology.

CO 3: Illustrate social groups and processes.

CO 4: Students will aware about the different social institutions.

Paper: 1.5 English

A student who has taken admission in BA (Hons.) Economics, First Semester is expected to target on the following outcomes in the study of Language and Literature-I.

CO 1: It will help the students to improve their basic knowledge of English language.

CO 2: It will help the students to brush up their grammatical skills.

CO 3: It will help the students to understand the poetic language and to infer the meaning of the difficult poems.

CO 4: It will help the students to develop their Technical Business Writing skills.

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Semester-II

Paper: 2.1 Indian Economy: Problems and Prospects–II

CO1: Understanding features of Indian Economy and problems of agro-based economy like India and various land reforms

CO2: Learning the need and significance of Industry for economic development and also to know role of large scale industries

CO3: Understanding Indian taxation system, its objectives and significance and to analysing centre state financial relationship

CO4: Knowing the reasons for new economic reforms and benefits from Libralization, Privatization and Globalization

Paper: 2.2 Micro Economics–II

CO1: Understanding oligopoly market and firms, techniques to take decisions of pricing and outcome and also analysing from group behaviour

CO2: Analysing various theories of objectives of firms both profit maximization and non-profit maximization and rational for decisions

CO3: knowing the factors deciding demand and supply of labour and theories of wage determination

CO4: understanding various theories of labour market and role of trade unions in wage rate determination

CO5: Analysing causes of market failures and understanding government roles for achieving market efficiencies

Paper: 2.3 Mathematics for Economic Analysis-II

CO1: Understanding differential equation and models and Real life problem like weather forecasting, disease control , marginal revenue , Maximization and minimization cost.

CO2: Understanding and applying integration in economic interpretation

CO3: Learning to find optimal solution through linear programming via simplex and graphics method.

CO4: Knowledge about higher order derivatives and constrained optimization

Paper: 2.4 Sociology–II

CO1: Knowing about rural and urban industrialisation and its impact

CO2: Understanding the material and non-material culture and its importance for society

CO3: Analysing different processes of social change particularly secularization, modernization and globalization

CO4: Knowing the reasons for social stratification on the basis of Caste, Class, Power and Gender and its impact on society

Paper: 2.5 English

CO1: It will help the student to gain basic knowledge of grammar and writing skills, particularly vocabulary and morphological structures.

CO2: It will help the student to enjoy the English prose and stories through reading and comprehension of the text.

CO3: It will the student to develop their technical writing i.e. E-mails, resume writing, T.V. programmes etc.

CO4: It will help the student to develop their writing skills through theme based paragraphs.

Programme Outcomes (POs) for B.A. (Hons.) Economics

PO1: Analysing theories of consumer behaviour for getting satisfaction and how government intervention can improve consumers' welfare
PO2: Analysing and understanding various techniques and production functions for optimum utilization of resources
PO3: Understanding and comparing performance of Indian economy over the planning period so as to know achievements and short comings of Indian plans
PO4: Understanding various economics concepts using mathematical and statistical tools and applying them in business decision making
P05: Evaluating scope and mechanism of International trade and payments and gains from international trade and knowledge of terms of trade

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Programme Specific Outcomes (PSOs) for BA (Hons.) Economics

PSO1: Understanding and analysing consumer behaviour to get satisfaction and how government intervention can improve consumers' welfare
PSO2: Learning the ways and means of achieving macroeconomics stability in the economy through understanding macroeconomic variables like National income, output and employment
PSO3: Analysing and comparing performance of Indian economy over the planning period so as to know the impact of five years plans
PSO4: Knowledge of mathematical and statistical analysis of various economic problems both at micro and macro level
PS05: Understanding and evaluating scope and mechanism of International trade and payments so as to analyse financial soundness of Indian economy and reasons and impact of international trade
PSO6: Identification and application of fiscal instruments viz., taxes and public expenditure for achieving socio-economic objectives of Government's policies

COURSE OUTCOMES
Name of Programme: B.Voc. (Software Development)

Semester -1

BVSD-101: Computer Fundamentals and Programming in 'C'

CO1: Student will be able to understand the basic Fundamentals of Computers, its application, types OF Computers, Different Operating Systems in real life.
CO 2: Students will be able to learn the problem solving by using If else , Switch as well as with the help Of looping concepts (by Using for, while, do while Loops) and c programming fundamentals.

CO 3: Student will be able to understand the concepts of Different types of Arrays and Use of Different Types of function Such as User Defined and Build In Functions Available in c language.

CO 4: Student will be able to understand the concepts of Structures and union in C Language and will be able to understand as well as implement the concept of File Handling in C Language.

BVSD-102: PC SOFTWARE

CO 1: The course provides basic knowledge of computers, its installation, the fundamental hardware components and the role of each of these components that helps in future aspects

CO 2: It helps students to represent their documents in better and effective form and helps them to use basic and advance features provided by MS-Word

CO 3: Students get the theoretical knowledge of use of various functions, formulas that can be further implemented to make their documents more readable. Charts, pivot tables etc features can be incorporated through MS-EXCEL

CO 4: Ability to present their data in form of slides that helps students in job point of view. MS-Access provides ability to maintain the database that helps students in various courses also

BVSD- 103: COMMUNICATION SKILLS

CO 1: Familiarize with the basics of Communication, process, barriers, models and theories of communication.

CO 2: Understands the verbal and nonverbal communication, oral presentation, self-presentation that boost their overall personality and self- confidence. Also they get to know the importance of body language.

CO 3: Ability to learn vocabulary, prefix/suffix, synonyms/antonyms, one word. substitution, spellings. Also develop fluency by using correct grammar that improves their written communication ability.

CO 4: Ability to gain proper use of Language. Knowledge to attend and behave in interviews and also learn presentation skills.

BVSD-104: Software Lab-I

CO 1: Students will be able to understand the Computer Crimes and different types of Viruses in computer. They get to know the installation of various operating systems as well as various software.

CO 2: Student will be able to understand to create a Simple Program using. Looping with the help of for, while, do while loops, and able to solve decision making problem using if else, Switch, nested if else.

CO 3: Student will be able to understand how to create and use Arrays and Functions such as user defined and built-in. They get to know the concept of reusability of code.

CO 4: Student will be able to create a Structure and Union in C Program and will be able to solve errors. Get to know about the user defined type. Students learn to take input and to produce output with the help of files.

BVSD-105: SOFTWARE LAB-II

CO 1: Provides hardware and software installation and to change the settings of desktop. Students get to know to create user accounts, set password, date and time settings etc.

CO 2: Able to design text documents in better and enhanced form. Incorporate advance feature in the text documents.

CO 3: Able to represent data in tabular and graphical form. Implement advance features such as lookup functions, pivot table etc.
CO 4: Get to know the arrangement of data in slides, use animations, custom animations etc. Get to know the maintenance of database and its connectivity which is used at higher levels to create projects.

Semester-2
BVSD-106: Data Structure through 'C'

CO 1: Students will be able to understand introduction, algorithm complexity, and Linked list operations in detail
CO 2: Students will be able to learn the concepts of Stack, Queue and all the different types of tree and operations on them in detail.
CO 3: Student will be able to understand the concepts Graph, sorting and searching in Detail.
CO 4: Student will be able to understand the concepts of Files & its type, Storages devices, hashing in detail.

BVSD-107: Object Oriented Programming using C++

CO 1: Get to know the basic coding techniques, features, control loops, basic initialization and declaration of variables as it provides direct communication with the hardware.
CO 2: Learn usage of functions, creation of classes, real life implementation into C++ codes, concept of polymorphism, usage of inline functions that improves efficiency of the code.
CO 3: Able to learn the basis for designing codes and to reuse the codes with the inheritance features, use of constructors, accessing of class members through object, dynamic binding.
CO 4: Get to know the most important feature of pointers, templates, handling of errors. Develop students' basis of coding. Learn the use of generic classes with templates.

BVSD-108: Essentials 0f Environmental Studies

CO 1: Students will be able to understand .about the components of environment, natural resources and role of an individual in conservation of natural resources.
CO 2: Students will be able to understand about the components of an ecosystem and they have the knowledge of environmental pollutants, causes, impacts of various types of pollution like air pollution, water pollution, noise pollution etc. and the role of an individual in minimization of environmental pollution.
CO 3: Students will be able to understand about the global environmental problems like ozone layer depletion, acid rain, green house effect, resettlement and rehabilitation etc.
CO 4: Students will be able to understand about environmental legislation like environmental protection act, air act, water act, and many more.

BVSD-109: Software Lab-III

CO 1: Students will be able to create different types of arrays and perform operations on them and they will be able to perform different operations on linked list like insertion, deletion, merging, sorting etc.
CO 2: Student will be able to Perform the different Operations on Queue, priority queue, circular queue etc. and Tree. They will be able to write the programs for various types of trees like b trees, b+ trees, and AVL tree.
CO 3: Student will be able to perform searching and sorting Algorithm. They can write

program for heap sort, merge sort.

CO 4: Student will be able to perform tasks on File Handling and Hashing. They actually get the practical knowledge of data storage in computer memory.

BVSD-110: SOFTWARE LAB -IV

CO 1: Get to know the implementation of basic coding features, initialization of variables.

CO 2: Develop the habit of coding in an effective manner with the use of loops, control statements, inheritance, pointers, templates etc.

CO 3: Able to design codes for various applications.

CO 4: Get to know the practical implementation of codes and to create projects, games etc.

Semester-3

BVSD-201: WEB DEVELOPMENT

CO 1: Provides basic features of a webpage, website, and web server. Get to know about the IP address, its classes, HTTP, errors related to HTTP, various versions of it.

CO 2: Learn theoretical knowledge to publish websites, getting DNS, webcasting techniques. Get to know about all the minute details of hosting a website.

CO 3: Basic knowledge of HTML, usage of tags, setting backgrounds for websites etc. Students learn about the various tags involved. Syntax of various graphics tags and text editing tags can be learned in HTML.

CO 4: Learn various tags, styling techniques, attributes and basic knowledge of java script format. Various types of CSS Selectors, types of styles that can be incorporated into the HTML file to decorate a webpage.

BVSD-202: JAVA Programming

CO 1: Student will be able to understand the basic concepts of object oriented Programming, history and comparison of java with other languages.

CO 2: Students will be able to understand the basics terminologies, Decision Making and branching in java. Students will be able to learn the problem solving by using If else, Switch as well as with the help Of looping concepts (by Using for, while, do while Loops)

CO 3: Student will be able to understand the concepts of abstraction, encapsulation, Different Types Of inheritance in java. Student will be able to understand and implements Arrays, Vector, and Multithreading. They can also perform the Different Operations on String also

CO 4: Student will be able to handle the Exceptions and error, I/o handling in java. They can also get the Knowledge of Applet Programming and Graphics Programming

BVSD-203: Discrete Mathematics

CO 1: Write set notation to indicate whether an object is, or is not, an element of a set. Perform the set operations of complement, intersection, union and set difference when given several sets. Visualize sets in a Venn diagram and determine the areas in the diagram that represent a given set where the set is written as a combination of set operations. Analyze a survey problem by making a Venn diagram and answering questions related to the survey.

CO 2: Students completing this course will be able to express a logic sentence in terms of predicates, quantifiers, and logical connectives. Know the rules of logic – negation, conjunction, disjunction, conditional and biconditional – and apply them to determine the truth value of a given statement. Students completing this course will

be able to apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction.

CO 3: Have a better understanding of sets, functions, and relations. Students will be able to simplify, evaluate and analyze functions and expressions. Students will be able to model real situations using functions.

CO 4: Present the theory of finite automata, as the first step towards learning advanced topics. Demonstrate different traversal

BVSD-204: SOFTWARE LAB -5

CO 1: Learn to design websites, web pages with the help of basic tags that help in writing concise and efficient codes.

CO 2: Able to create links, to set source, designing for the links, lists, different types of lists available according to the need of data that is to be represented, tables, to include heading, captions, use of cols pan, rows pan etc. to enhance the designing of websites.

CO 3: Able to implement various graphics features in the web pages with the help of graphics tags. WebPages can be designed more effectively with the use of various text editing and formatting tags.

CO 4: Get to design the web pages with the help of CSS, Java Script. Get to know the designing of user interactive forms used for various registration purposes. Students get to know the creation of different types of dialog boxes and can include various events and actions.

BVSD-205: Software Lab-VI

CO 1: Students will be able to create a simple java programs using Different Data types, Tokens and they can get the Practical Knowledge Of Byte Code, Java Development Kit also

CO 2: Student will be able to solve Decision making problems by using looping with the help of for, while, do while loops They can also solve real life problems like eligibility or any other condition based decision by using if else, switch statements

CO 3: Student will be able to perform the Operations on Arrays, Vector, multithreading. They can also perform different operations on String so that they can Store, Access and manipulate the real life Data by Java

CO 4: Student will be able to Understand and Manage Error, Exception. After that they will be able to handle and solve any Exception in Program .They can also able to Perform different types of operation on File by Java Program. They will be able to access any file by using Java Program

Semester-4

BVSD-206: Computer Network

CO 1: Students will be able to understand the Introduction to communications and Networking , Information encoding in detail

CO 2: Student will be able to understand the Analog and digital transmission methods, Modes of data transmission and Multiplexing, Transmission Errors in detail.

CO 3: Student will be able to understand different Transmission media, Network topologies, switching and routing algorithms in detail.

CO 4: Student will be able to understand different Networking protocols and OSI model in detail.

BVSD-207: Advance JAVA

CO 1: Familiarize with the basic components of Core Java concepts

CO 2: Understands the concept of JDBC and able to connect java code with database and also understand client server relations necessary for a project.

CO 3: Ability to understand User Interface for a Java Desktop Applications.

CO 4: Able to understand concept and importance for Bean class in java.

BVSD- 208: PHP Programming

CO 1: Familiarize with the basic concepts of PHP and able to develop program by using PHP scripts.

CO 2: Understands the conditions and iterations process in programming and implement them.

CO 3: Ability to learn knowledge about arrays and their functions and also make use of date and time functions.

CO 4: Ability to make use of files and directories and also familiar with database and Error handling.

BVSD- 209: Software Lab-VII

CO 1: Familiarize with the basic concepts of Core Java practically.

CO 2: Able to connect java code with database and also understands client server relations necessary for a project.

CO 3: Ability to develop User Interface for a Java Desktop Applications.

CO 4: Able to develop Bean class in java.

BVSD- 210: Software Lab-VIII

CO 1: Familiarize with the basic concepts of PHP and able to develop program by using PHP scripts.

CO 2: Understands the conditions and iterations process in programming and implement them.

CO 3: Ability to learn knowledge about arrays and their functions and also make use of date and time functions.

CO 4: Ability to make use of files and directories and also familiar with database and Error handling.

Semester -5

BVSD-301 : RDBMS and Oracle

CO 1: Students will be able to analyze database design and basics of Data Models, methodology and understand the application of database system in real life.

CO 2: Student will be able to understand the overview of oracle 9i and will be able to understand the data definition language (DDL) commands.

CO 3: Student will be able to understand how to retrieve and manage the data by using the concept of dm commands they can Operation Like Functions, Joins, Grouping on data in Database.

CO4: Student will be able to understand the relationship between pl and sql language languages they can get the Knowledge of Control Structures and Embedded SQL.

BVSD-302: Visual Programming-Visual Basic, Visual C++.

CO 1: The contents will support to learn basic programming using GUI (Graphical User Interface) with the help of IDE (integrated development environment). This course provides the Event Driven programming so that student can understand that how real

applications are working in industry.

CO 2: The contents will provide the knowledge to integrate various component and tool to the application which help the students in their higher education in Advance or upgraded software which is used in mobiles and other gadgets

CO 3: In this content student will create their own event and procedures also learn the combine use of machine and logics. It will help them to identify and apply the concept in actual use of practical applications especially in industry.

CO4: The contents will provide the visual way of working with traditional languages. Management of data with programming which is day to day requirements of an industry. The content will also explore the Microsoft Library and their use in real applications like Bank, Education Sector, and Hospital etc.

BVSD-303: Software Engineering

CO 1: Familiarize with the basic components of Software Processes and ability to understand the requirements of a software system.

CO 2: Demonstrate the ability to work effectively as a team member and/or leader in an ever-changing professional environment

CO 3: Able to analyze requirements of a software system and solve them by using various software modeling techniques.

CO 4: Efficient to understand how to plan and manage various software and complete them within deadline of a Project.

CO 5: Efficient to learn various Testing techniques to debug and test a software project.

CO 6: Ability to analyze, design, verify, validate, implement, apply, and maintain software systems.

CO 7: Ability to analyze estimate Size and cost of a software project by the cost estimation techniques.

CO 8: Able to understand how Developers can work in various software industries as in professional environment.

BVSD-304: Software Lab-IX

CO 1: Understand the applications of DBMS, difference between file systems vs. DBMS, identify the data models ,understand DBMS structure.

CO 2: Understands the relational algebra concepts, selection ,projection ,relational calculus which helps in understanding queries

CO 3: Able to learn DDL commands, DML commands, queries

CO 4: Understands the need of normalization, Normal forms I, II, III, IV BCNF

CO 5: Able to write PL/SQL block of different queries in a single block and nested blocks.

BVSD-305: Software Lab-X

CO 1: It helps to understand the use of IDE (integrated development environment). Creates their own Apps with basic features.

CO 2: Implement various component and tool to their application and create a small stand alone software which they can use in their daily life also they can make some small gaming product with the help of these contents.

CO 3: Helps to understand the code implementation in arrays and loops. Students get to know the concept of functions, data files. These concept help in searching files in system and other application on disk..

CO4: Students get to implement the concept of MFC, its various functions. They learn the

database connectivity in the project with the help of MS- SQL Server and ODBC connectivity.

Semester-6

BVSD-306: COMPUTER GRAPHICS

CO 1: Learn the basic working of monitors, input devices, output devices, how the system make use of them.

CO2: Learn point, line, circle drawing algorithms, various polygon filling algorithms presented by various scientists..

CO 3: Able to view the live things in 2-D and 3-D ways with the help of 2-D and 3-D viewing techniques. Learn usage of clipping algorithms.

CO 4: Get to know the various geometric transformations, curves from the point of coding that are used in daily life.

BVSD- 307: .NET Programming

CO 1: Familiarize with the basic concepts of .NET Programming and how to implement and work with concepts..

CO 2: Able to understands use of data types, and also learn to stop abnormal terminations via using exception handling.

CO 3: Able to learn Object Oriented Concepts and implement them in a programming way.

CO 4: Able to make and design User interface for their Applications which includes forms, all types of buttons etc.

BVSD-308: ARTIFICIAL INTELLIGENCE

CO 1: Able to understand the basic meaning of artificial intelligence which is the basis of today's technology and robotics. Learn the interaction of machines with each other.

CO 2: Learn to develop the basic intelligence into machines just like human beings and animals. It provides the techniques to develop the brain that can work as human beings' work.

CO 3: Develop the techniques used in language processing. Learn to design machines that can work on human orders.

CO 4: Get to understand the actual problem and to check its progress with the help of various production system and various search techniques.

BVSD-309: SOFTWARE LAB- XI

CO 1: Implementation of point, line, circle drawing algorithms, various polygon filling algorithms in C language.

CO 2: Implement various transformations, clipping algorithms that help in animations. Able to create designs for aircrafts, buildings, machines with the use of graphics.

CO 3: Helps students to create real life projects and to implement them.

CO 4: Implement codes to design and develop websites and to place them on the server.

BVSD- 310: Project Work & Viva-Voce

CO 1: Objective of Project work is to gain industrial knowledge on the implementation of the various software development concepts.

CO 2: Each and Every student will have assign individually one Project Work and they have made them by using the software tools/ languages that they have learned.

CO 3: Able to gain practical knowledge and implement all learning concepts in form of a application.

CO 4: Also Able to make and design User interface for their Applications which includes forms, all types of buttons, database etc. able to access data from file. Perform real life

functions like take input from user, perform operation on data accordingly and provide require output to the user.

Programme Outcomes (POs) for B. Voc. (Software Development)

PO 1: The B.Voc. SD programme focuses on all development (theoretical practical and personality) needs of the students
PO 2: All contents are mapped with current I.T Industrial requirements
PO 3: Total Focus on Practical Knowledge Of Computer Technology. It will help them to create a Good Base to Work in I.T Department Jobs
PO 4: Course based on Projects concerning design, development and maintenance of software. Students will also learn about the organizational and managerial part of a development process.
PO 5: Provide Industry orientation for covered syllabus .
PO 6: They will be able to create Projects with the help of Different Programming Language and Database.

Programme Specific Outcomes (PSOs) for B. Voc. (Software Development)

PSO 1: This program specifically focuses on Students skill improvement with good conceptual Knowledge, Practical Knowledge and communication skill.
PSO2: Student will take Industries orientation where they undergo the stages of software development in groups with teamwork and leadership concepts.
PSO 3: This Program provides education in a variety of programming paradigms, testing, processes, and software development processes, teaching them adaptability and frequent change in industries.
PSO 4: This Program provides projects design & development, maintenance of software. Re engineering in software with innovation.
PSO 5: This Program will develop entrepreneurship, creativity and leadership skill in students .
PSO 6: They will learn about professional ethics and legal aspects of software development in for their future in IT Industries in very

COURSE OUTCOMES
Name of Programme: B.Voc. (Retail Management)

Semester-I

Paper: BVRM-101English

CO1: Writing Skills including Resume Writing, Project Report writing
CO2: Reading Skills, Oral Communication (Internal & External)

Paper: BVRM-102 Basics of Marketing

CO 1: Analyzing Features and Benefits of Products
CO 2: Discussing the need for increasing sales and promotions
CO 3: Appreciating seasonal trends and their impact on sales
CO 4: Explaining the difference between product features and benefits
CO 5: Knowing different ways of promoting products

Paper: BVRM-103 Fundamentals of Customer Services

CO 1: Implementing Changes in Customer Service Standards
CO 2: About collecting, analyzing and presenting customer feedback
CO 3: Implementing Changes in Customer Service Standards
CO 4: Discussing the use of the analysis and interpretation of implemented changes in customer service standards to identify further opportunities for improvement

Paper: BVRM-104 Basics of Retailing

CO 1: Work Effectively in a Retail Team
CO 2: Plan and Organize Work Routine
CO 3: Understand Retail Store Management and its Value Chain
CO 4: Define Retailing**,** Evolution of Retail in India, Indian Retail Industry
CO 5: Have information on Organized and Unorganized Retail Sector, Types of Retail Formats, Pre-Store Opening, Store Opening and Closing, Loss Prevention &Shrinkage, Store Merchandise Handling, Basics of Visual Merchandising

Paper: BVRM-105 Project Work (Safety methods at work Place)

CO 1: Students will learn the practical tactics of retail business
CO 2: They will know processing credit applications for purchases
CO 3: Course will help maintain health and safety standards and protocols
CO 4: The course will provide specialist support to customers facilitating purchases
CO 5: Acquire knowledge on organization and the delivery of reliable service

Paper: BVRM-106 Computer Practicals-I (MS-Office)

CO1: Enhance the knowledge about the usage of the Computer and IT in retail business
CO2: Understand How to maintain customer database

Semester-II

Paper: BVRM-107 Computer Application in Retail Business

CO 1: The course will produce enhanced knowledge about the usage of the MIS in retail business
CO2: The students will learn the use and significance of Computers in retail business

Paper: BVRM-108 Fundamental of Accounting

CO 1: This paper is aimed at providing comprehensive knowledge of maintenance of accounts under different agreements.

CO 2: Contents will make students learn how to manage a budget
CO 3: Course will teach students how to maintain the availability of goods for sale to customers

Paper: BVRM-109 Environmental Studies

CO 1: This Course is aimed at providing a comprehensive knowledge of mechanism of Ecological System
CO 2: Make students aware of significance of health maintenance and safety

Paper: BVRM-110 Business organization and management

CO 1: This course will impart conceptual knowledge of different forms of Business Organizations
CO 2: The contents will impart the knowledge about the sale process of products
CO 3: The course will make students learn how to work effectively in their organization and to communicate effectively with stake holders

Paper: BVRM-111 Project Work (Health and Hygiene at work place)

CO 1: Overview of Various Departments in any retail setup
CO 2: Knowledge on process credit applications for purchases
CO 3: Organizing the delivery of reliable service
CO 4: How to follow the health and safety requirements laid down by company and by law, and encourage colleagues to do the same.

Paper: BVRM-112 Store Operations-I

CO 1: Inventory Management, Merchandise Management
CO 2: Develop Sales Strategy and Campaigns, plan visual merchandise
CO 3: Monitor and manage store performance, Manage a budget

Semester-III

Paper: BVRM-201 Business communication

CO 1: Explaining Product Features and Benefits to Customers to Promote Sales and Goodwill
CO 2: Helping Customers Choose Products and Handling Customer Queries
CO 3: Collecting and Interpreting Customer Responses and Acknowledging Customer Buying Decision

Paper: BVRM-202 Basic Maths and Statistics

CO 1: After learning the contents of this course, student should be able to perform mathematical, logical calculations required for decision making in day today retail business.
CO 2: Students will be able to Monitor and manage store performance

Paper: BVRM-203 Customer Relationship Management

CO 1: This course will enable the students to learn the basics of Customer Relationship Management.
CO 2: Make students understand relationship marketing and about Learnt Sales Force Automation Learnt Database Marketing
CO 3: The course will provide skills on specialist support to customers facilitating purchases

Paper: BVRM-204 Retail Management

CO 1: A comprehensive understanding of the theoretical and applied aspects of retail management.
CO 2: Establishment and satisfying customer needs
CO 3: Monitoring and managing store performance
CO 4: Providing leadership for their team

CO 5: Maintaining the availability of goods for sale to customers
CO 6: Helping customers choose right products

Paper: BVRM-205 Project Work (customer needs and satisfaction)

CO 1: Overview of Various Departments in any retail setup
CO 2: Knowledge on how to Plan visual merchandise, monitor and manage store performance
CO 3: Information on how to develop individual retail service opportunities

Paper: BVRM-206 Computer Practical-II (Ms- Powerpoint& Internet)

CO 1: Student will be able to Create an e-mail id and check the mail inbox.
CO 2: They will be capable of Working with E-Commerce websites, shopping cart, online shopping.
CO 3: Students will know details and protocols of Web Designing: , HTML ,Basic structure of HTML document, creating HTML document, Heading Tags, formatting tags, HTML tags, working with lists, tables, hyperlinks, images and also how to Create a simple website.
CO 4: They will know how to design presentation slides about an organization; for the Seminar/Lecture Presentation using animation Effects, and perform frame movement by interesting clip arts to illustrate running of an image automatically.

Semester-IV

Paper: BVRM-207 Business Economics

CO 1: This course aims to make the student understand how the business organizations work by applying economic principles in their Business Management.
CO 2: Course will provide input to the merchandising /category teams on best prices offered by competitors
CO 3: Course will help in Identifying and describing all policies related to collection of market data

Paper: BVRM-208 Human Resources Management

CO 1: Job Role of Team Leader and skill sets of a competent Team Leader
CO 2: Understanding Company Policies and Procedures
CO 3: Working effectively in Team and in your organization

Paper: BVRM-209 Supply Chain Management

CO 1: Create awareness about the supply chain activities taken in order to deliver the goods
CO 2: Produce skills how to organize the delivery of reliable service
CO 3: Know students how to maintain the availability of goods for sale to customers

Paper: BVRM-210 Consumer Behaviour

CO 1: Conceptual knowledge about consumer behaviour and other related issues.
CO 2: Helping customers choose right products
CO 3: Creating a positive image of self and organisation in the customers mind
CO 4: Resolving customer concerns, to improve customer relationship
CO 5: Demonstrating products to customers.

Paper: BVRM-211 Project Work

CO 1: Managing Retail Operations, learn to measure productivity & Operating Efficiency
CO 2: Controlling essentials for successful operations, Measuring Performance,Stock Turn
CO 3: Describing the opportunities for up-selling , Explain about opportunities of cross-selling
CO 4: Listing various ways of pitching for up-selling and cross- selling
CO 5: Identifying customers' requirements for additional associated products

Paper: BVRM-212 Store Operations-II (Including Warehouse)

CO 1: Understanding significance of proper maintenance of store
CO 2: Understanding methods of using cleaning equipment
CO 3: Recognising the importance of clean store
CO 4: Perpetuating personal hygiene at work

Semester-V

Paper: BVRM-301 Personality and soft skill development

CO 1: After completion of the course students will be familiar with different aspects of personality and role of soft skills in personality development.
CO 2: Students will be familiar with Psychology and Success, Self-Awareness, Goals and Obstacles, Positive Thinking, Self-Motivation, Managing your resources

Paper: BVRM-302 Store Layout and Design

CO 1: This Course is aimed at providing comprehensive knowledge of Store Location, layout and operations
CO 2: Students will be able to explain store policy and procedures in regards to health, hygiene and safety clearly and accurately
CO 3: The course will create awareness on 'Prevention of Sexual Harassment' and enforce adherence to policy and to standards
CO 4: Students will learn operating procedures, processes and policies at the store while ensuring timely and accurate reporting
CO 5: They would learn to ensure overall safety, security and hygiene of the store role and importance of merchandise display in attracting customers

Paper: BVRM-303 E-Commerce

CO 1: This course will make students understand the concepts and Application of E-Commerce
CO 2: Make students learn techniques on Online transactions
CO 3: They will learn Handling of Websites

Paper: BVRM-304 Elements of Salesmanship

CO1: Product and Service Knowledge
CO 2: Knowledge on Retail markets - Competition and Best Practices
CO 3: Skill to have information on availability of goods for sale to customers
CO 4: Help students knowing Process Sale of Products Goal Setting / Target Allocation & Monitoring
CO 5: Learning Customer Experience Management, Establishing and satisfying customer needs

Paper: BVRM-305 TALLY

CO 1: With this course students will be able to Create a new company, group, voucher and ledger and record transactions and display the relevant results.
CO 2: Students will know Preparing trial balance, Profit and Loss A/c and Balance Sheet.
CO 3: They will attain skills in preparing inventory statement using (Calculate inventory by using all methods)

Paper: BVRM-306 Summer Training

CO 1: After this course the student will be able to understand the role and significance of training and development in Store Operations.
CO 2: The course will also help in understanding the Skills required for effective Training delivery

Semester-VI

Paper: BVRM-307 Merchandise buying and planning

CO 1: Store Merchandise Handling and Basics of Visual Merchandising
CO 2: Explain assembling of products before display
CO 3: Know about safe transfer of merchandise to display area
CO 4: Learn to review product condition
CO 5: Explain cleanliness of display area, accessories and equipment
CO 6: Elaborating estimation of quantity for products to be displayed

Paper: BVRM-308 Retail Operations

CO 1: Monitoring operations against defined targets of the department
CO 2: Reporting factors influencing effectiveness of department
CO 3: Creating new and effective ways of improving the visual effect of displays
CO 4: Checking the quality of the products and customer service maintainance
CO 5: Making recommendations to improve retail operations
CO 6: Identifying procedures to create a Budget

Paper: BVRM-309 Entrepreneurship Development

CO 1: Student will be able to make the students to prepare business plans.
CO 2: They will also learn about Retail Store Management and its Value Chain Optimize inventory to ensure maximum availability of stocks and minimized losses .
CO 3: Students will be able to identify the financial helps provided by Govt., Banks and other institutions.

Paper: BVRM-310 Advertising and Brand management

CO 1: Help students to understand the concept of marketing and its applications.
CO 2: Expose the students to the latest trends in marketing and advertising.
CO 3: Help monitoring and solving service problems and to promote continuous improvement in service , to maximize sales of goods & services
CO 4: Let the students know how to provide specialist support to customers facilitating purchases of various brands and reliable service

Paper: BVRM-311 Fundamentals of Visual Merchandising (VM)

CO 1: Understanding the role and importance of merchandise display in attracting customers
CO 2: Explaining assembling of products before display, Know about safe transfer of merchandise to display area
CO 3: Learning to review product condition, Explain cleanliness of display area, accessories and equipment, Elaborate estimation of quantity for products to be displayed
CO 4: Analyzing concepts related to elements of display, Learn about potential places for product display, illustrating how one can manage colour and space to display.

Paper: BVRM-312 Comprehensive Viva-Voce

CO 1: Ensure that candidate is able to understand the theoretical aspects as well as practical aspects of retail operations.
CO 2: Ensure that students has proper communication skills , and presentation skills.

Programme Outcomes (POs) for Vocational Courses
B.Voc. (Retail Management)

PO1: Leads to Bachelor of Vocation (B.Voc.) Degree with multiple entry and exit points
PO2: Incorporates specific job roles along with broad based general education
PO3: Enables 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
PO4: The graduated students acquire adequate knowledge and skills to enhance employability and meet industry requirements
PO5: Demonstrate knowledge and understanding of the management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
PO6: The graduated students is able to

i. Demonstrate products to customers and help customers choose right products
ii. Identify suitable opportunities to tell the customer about associated or additional products and provide specialist support to customers facilitating purchases
iii. Gather relevant and accurate information about the effectiveness of promotions and communicate this information clearly to the right person
iv. resolve customer concerns and improve customer relationship

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Programme Specific Outcomes (PSOs) for Vocational Courses
B.Voc. (Retail Management)

PSO 1: The students pursuing B.Voc. Retail Management Program will have a judicious mix of skills relating to professional education and general education.

PSO 2: The B.Voc. Programme is focused on providing undergraduate studies which would also incorporate specific job roles along with broad based general education.
PSO 3: 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.
PSO 4: The students have adequate knowledge and skills so that they are work ready at each exit point.
PSO 5: The students will have enhance employability possibilities and will meet industry requirements.

Aggarwal College Ballabgarh

A Co-educational Post Graduate College Accredited 'A' Grade by NAAC (CGPA 3.40)
College with Potential for Excellence (CPE) Status by UGC
Affiliated to M.D. University, Rohtak

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Course Outcomes (COs), Programme Outcomes (POs) & Programme Specific Outcomes (PSOs) for PG Programmes

The Course Outcomes (COs), Programme Outcomes (POs) & Programme Specific Outcomes (PSOs) for PG Programmes have been stated by the Affiliating University i.e. Maharshi Dayanand University, Rohtak and the same are available at the University Website at www.mdurohtak.ac.in. However for the convenience of teachers and students, the web-link for the PG programmes being run in the college is giving in the following table.

PRINCIPAL
AGGARWAL COLLEGE
BALLABGARH (FBD)