G.V.M. GIRLS COLLEGE, SONIPAT

College with Status of 'Potential for Excellence'
Re-accredited with 'A' Grade by NAAC
(Affiliated to Maharshi Dayanand University Rohtak)

INDEX

Course Outcomes (COs), Programme Outcomes (POs) and Programme Specific Outcomes (PSOs) for U.G. Programmes

Course Outcomes (COs), Programme Outcomes POs) and Programme Specific Outcomes (PSOs)

Mechanism of Communication:

The college has its own structured mechanism to communicate well stated. POs, COs and PSOs of the curriculum to the teachers and stduents

- Soft copy of curriculum, outcomes of programmes, COs and PSOs are uploaded on the institution website for reference
- The importance of learning outcomes is communicated to the teachers in IQAC meeting/ Staff meeting
- Hard copies of syllabi and learning outcomes are available to the teachers and stduents for ready reference, in their respective departments
- Learning outcomes of the programme and courses are observed and measured periodically
- Stduents are communicated about POs, PSOs and COs in Mentor-Mentee meetings and class rooms

Programme Name - B.A.

Programme Outcomes of B.A.

PO1: The programme empowers the students to appear for various competitive examinations or opt for the Post Graduate Programmes of their choice

PO2: The students widen their knowledge sphere in the field of various Social Sciences, Literature and Humanities which sensitize them to human needs

PO3: The programme broadens the perspective of the students, chisels their thought process helping them to find solutions to various issues in life

PO4: The programme apprises them of the nuances of language which improves their communication skills

PO5: The students are acquainted with the economical, psychological, political, historical and social traditions and ways of eminent thinkers

PO6: The programme through selective learning of subjects enriches the curriculum with practical activities/project work and increases interaction of teachers with students

PO7: The programme strengthens the students to avail and explore opportunities to prosper in life with the efficiency acquired during programme

PO8: Use of ICT in classroom teaching helps in providing experimental learning which leaves a lasting impact on their higher studies as well

Programme Specific Outcomes of B.A.

The students will be

PSO1: Able to appear for various competitive examinations or opt for the Post Graduate Programmes of their choice

PSO2: Enlightened enough to be acquainted with the economical psychological, political, historical and social traditions and ways of eminent thinkers

PSO3: Better communicators after being familiarized with the nuances of languages - their meaning, feeling and value

PSO4: Enlightened having stimulated minds widening their perspective to think and act over for the solutions of various problems prevailing in society

PSO5: The B.A. programme will enrich the students with ethical and human values inculcated through reading of several social sciences and literature

B.A.(English)

Semester-I

At the end of the course, students will be able to

CO1 Identify and memorize phonetic symbols, i.e. vowels, consonants and diphthongs
CO2 Get a rudimentary idea of phonetic transcription
CO3 Gain an understanding of four skills of language learning and inference based text
CO4 Comprehend critical analysis of the essays written by renowned social scientists
CO5 Enhance and enrich vocabulary by analyzing words at different levels of meaning
CO6 Learn to apply rules of grammar for creative writing

Semester-II

At the end of the course, students will be able to

CO1 Transcribe one/two syllabic words of english language into phonetic symbols
CO2 Learn other forms of the words given in the text and practice in order to add to vocabulary
CO3 Develop the capacity to critically analyze the topics i.e. short stories in long answers on the basis of comprehension of the subject of their text
CO4 Learn rules of grammar and will be able to correct sentences from outside the text
CO5 Write their own views in the form of essays on different subjects of topical importance

Semester-III

At the end of the course, students will be able to

CO1 Explain passages of poetry of the text with due reference to the poet and his works and will be able to add critical comments
CO2 Develop understanding of the poems of the text and will learn to write their own inferences in the form of short and long answers
CO3 Answer the questions put up to them on the basis of comprehension of passages
CO4 Gain knowledge of various literary terms and poetic forms of literature with reference to prescribed text
CO5 Learn and practice grammar rules, composition of paragraphs, essays and add to their vocabulary to attain more confidence in writing skills

Semester-IV

At the end of the course, students will be able to

CO1 Learn and understand literary form of one-act-plays written by renowned authors of the world and will develop the skill of explaining the passages of the play with reference and critical analysis
CO2 Express their own views and opinions on various aspects of the plays of their text in the form of short and long answers and will develop critical understanding

CO3 Learn the art of translating passages from hindi to english and vice versa, on the basis of rules of grammar learned from previous courses and present ones, appended to the chapters in the text

CO4 Learn correct pronunciation of english words with the help of stress patterns in english language as well as the skill of trancription

CO5 Learn to compose mails, compose dialogues based on imaginary conversation and compose effective resumes for various professions and jobs

Semester-V

At the end of the course, students will be able to

CO1 Get knowledge of Indian fiction and its historical importance

CO2 To comprehend, infer and evaluate text through reading

CO3 Enhance the creative writing skills by writing and learning text based question and answers

CO4 Learn literary terms and explain them properly

CO5 Enrich the understanding of advanced grammar by learning types of sentences and conditional defining and non-defining clauses

Semester-VI

At the end of the course, students will be able to

CO1 Gain knowledge of Shakespearean drama and work and life of the dramatist

CO2 Interpret the play, explain speeches of characters with reference to the text

CO3 Enhance the creative writing skills by composing question answers

CO4 Learn to write précis, abstracting, summarizing and comprehend the unseen passages

CO5 Enrich their knowledge by learning to write formal letters

B.A.(Hindi)

बी॰ए॰ प्रथम सेमेस्टर

1. निर्धारित मध्यकालीन कवियों के माध्यम से निर्गुण एवं सगुण भक्ति का ज्ञान, अनुभूतिगत सौन्दर्य एवं अभिव्यक्तिगत सौन्दर्य से अवगत कराना।
2. आदिकालीन समाज की राजनीतिक, सामाजिक, धार्मिक, आर्थिक एवं साहित्यिक परिस्थितियों का ज्ञान कराना।
3. काव्यशास्त्र के माध्यम से काव्य के विभिन्न तत्वों, स्वरूप एवं भेदों से परिचित कराना।

बी॰ए॰ द्वितीय सेमेस्टर

1. निर्धारित पाठ्यपुस्तक के माध्यम से आधुनिक समाज की समस्याओं से अवगत कराना एवं उनका समाधान प्रस्तुत करना।

2. मध्यकालीन साहित्य के माध्यम से भक्ति के उद्‌भव एवं विकास का ज्ञान, भक्ति के विभिन्न रूपों का परिचय।
3. व्यावहारिक हिन्दी के अन्तर्गत भाषा के विभिन्न रूपों का ज्ञान प्रदान कराना।

बी.ए. तृतीय सेमेस्टर

1. आधुनिक हिन्दी कविता पुस्तक के माध्यम से विद्यार्थियों को विशिष्ट कवियों की साहित्यिक जानकारी देते हुए उन्हें उनके अनुभूतिगत वैशिष्टय और अभिव्यक्तिगत सौष्ठव से परिचित करवा कर उनके ज्ञान में वृद्धि करने का प्रयास करना।
2. हिन्दी साहित्य के इतिहास के माध्यम से 'रीतिकाल' की पृष्ठभूमि और उपलब्धियों से परिचित करवाना।
3. प्रयोजनमूलक हिन्दी के माध्यम से कम्प्यूटर, इंटरनेट अनुवाद का ज्ञान कराना।

बी.ए. चतुर्थ सेमेस्टर

1. कथा–साहित्य के माध्यम से विद्यार्थियों को समाज की विविध समस्याओं से अवगत कराने का प्रयास कराना।
2. उपन्यास, कहानी, नाटक और निबन्ध की विकास–यात्रा का परिचय कराना।
3. पारिभाषिक शब्दावली की आवश्यकता और उसका हिन्दी भाषा में क्या महत्त्व है – इसकी जानकारी से विद्यार्थियों को अवगत कराना।

बी.ए. पंचम सेमेस्टर

1. आधुनिक हिन्दी कवियों की दृष्टि एवं सामाजिक सरोकार, जीवन दर्शन, चिंतन एवं कलात्मक विशिष्टता को समझना।
2. आधुनिक हिन्दी कविता के इतिहास–अन्वेषण, विकास, रचनाओं की क्रमबद्ध जानकारी एवं मानव समाज के परिवर्तनशील मूल्यों से प्रभावित साहित्य–दृष्टि से अवगत होना।
3. प्रयोजनमूलक हिनदी के विविध रूपों–संक्षेपण, पत्रलेखन एवं पल्लवन लेखन की सैद्धान्तिक एवं प्रायोगिक जानकारी प्रदत्त करना।

बी.ए. षष्ठम सेमेस्टर

1. निबन्ध के विविध रूपों, निबन्धकार एवं निबन्ध–कला, चिंतन एवं दर्शन की भास्वर रेखाओं से रूबरू होना।
2. हरियाणवी भाषा एवं हरियाणवी लोक साहित्य की विविध विधाओं, रचनाओं एवं साहित्य पर पड़ने वाले समाजगत परिवर्तन का ज्ञान प्रदत्त करना।
3. हिन्दी पत्रकारिता के स्वरूप, सिद्धान्त एवं लेखन विषयक जागरूकता प्रदान करना।

B.A.(Sanskrit)

बी.ए. प्रथम सेमेस्टर

1. 'संस्कृत वाग्व्यवहार' से छात्राओं को दैनिक जीवन में उपयोगी सामान्य वाक्यों के सम्भाषण का अभ्यास कराना है।
2. हितोपदेश से छात्राओं को नैतिक–शिक्षा, सोच–विचार कर कार्य करने की समझ, संगति, दैनिक जीवन में व्यक्ति को परख कर वित्रता करना आदि लौकिक सामाजिक व्यवहार की जानकारी।
3. शब्द रूप, धातु रूप आदि प्रारम्भिक सामान्य व्याकरण द्वारा पद रचना, प्रत्ययादि की जानकारी।
4. सन्धि द्वारा शब्द–निर्माण तथा शब्द व्युत्पत्ति, सार्थकतादि की समझ।

बी.ए. द्वितीय सेमेस्टर

1. हिन्दी से संस्कृत में सामान्य लघु वाक्य–निर्माण की जानकारी।
2. कण्ठस्थ–श्लोकों से उच्चारण सीखना।
3. 'दूतवाक्यं' से युद्ध की अपेक्षा शान्ति को महत्त्व दें, सम्बन्धियों के प्रति प्रेम, समाजलहित के लिए कर्त्तव्य–पालन को महत्त्व देना आदि विषयों की जानकारी।
4. शुकनोसोपदेश में, छात्राओं को युवावस्था में सोच–विचार कर कार्य करना, संस्कारों व चरित्र को महत्त्व, धन, मद, विषयवत हानिकारक है आदि समझ देना।
5. सामान्य–व्याकरण का ज्ञान।
6. छन्दों द्वारा पद्य रचना, लय, गायन, यति आदि का ध्यान करना।

बी.ए. तृतीय सेमेस्टर

1. संस्कृतव्यवहारसाहस्त्री से, छात्रों को दैनिक संस्कृत–वार्तालाप का लाभ।
2. रामायण के बाल–काण्ड के माध्यम से, सामाजिक, सांस्कृतिक, पारिवारिक सम्बन्धों की जानकारी। आदर्शवादी व्यक्ति बनने की प्रेरणा।
3. तद्धित, णिच्, सन् प्रत्ययों से संस्कृत व्याकरण के द्वितीय स्तर की जानकारी।
4. समास द्वारा विशाल की संक्षिप्त करके लिखना, संक्षिप्त को खोलकर समझना भाषागत जानकारी।
5. हिन्दी को संस्कृत करने का अभ्यास।

बी.ए. चतुर्थ सेमेस्टर

1. श्रीमद्भगवद्गीता द्वारा लोक–व्यवहार में भगवद्गीता की उपयोगिता, आत्मा–नित्य, शरीर अनित्य, कर्त्तव्यपरायणता, समीाावना रखना, विषय के प्रति एकाग्रचित्त होने की विधि का ज्ञान।

2. रघुवंश महाकाव्य में श्रेष्ठ राजा, दिलीप की प्रजा–वत्सलत, गौ सेवा, कर्त्तव्यपरायता के माध्यम से छाओं को दैनिक जीवन सजग करना।
3. कृत–प्रत्यय एवं समास द्वारा व्याकरण तृतीय–सतर का ज्ञान।
4. प्रत्याहार सूत्र से वर्ण परिचय।
5. संस्कृत में पत्र–लेखन अभ्यास।

बी.ए. पंचम सेमेस्टर

1. संस्कृत वाग्व्यवहार द्वारा छात्राओं द्वारा संस्कृत–वार्तालाप कराना।
2. कालिदास के सुप्रसिद्ध नाटक अभिज्ञानशाकुन्तलम से छात्राओं को वातावरण के प्रति सजग, विषय वासनात्मक प्रेम से दूर रहना, प्रकृति आदि से अवगत कराना।
3. वैदिक साहित्य–वेद, ब्रह्माण, उपनिषद, आरण्यक व वेदांग को वर्ण्य–विषय की जानकारी प्राप्त होना।
4. व्याकरण के अन्तर्गत एवं सूत्रों द्वारा पुल्लिग शब्दों को स्त्रीलिंग बनाना।

बी.ए. षष्ठम सेमेस्टर

1. संस्कृत–वार्तालाप।
2. अभिज्ञानशाकुन्तलम के (5–7 अंक) काव्य के अंग–भाषा शैली, रस अलंकार, छन्द, प्रकृति–चरित्र आदि का ज्ञान। राजा की कर्त्तव्य भावना, पारिवारिक सम्बन्ध, ऋषियों का सम्मान, भौगालिक जानकारी।
3. लौकिक संस्कृत साहित्य का ज्ञान।
4. निबन्ध लेखन
5. भाषा को अलंकृत करने वाले काव्यांग अलंकारों का प्रयोग।

B.A.(Mathematics)

Semester I
Subject: Algebra (BM 111)

At the end of the course, students will be able to

CO1: Know about the basic concept of matrices and identify its types
CO2: Learn about Eigen values and Eigen vectors of a matrix and to apply Caley Hamilton Theorem for finding the inverse of matrix
CO3: Learn to solve system of homogeneous and non-homogeneous linear equations
CO4: Find the roots of cubic and biquadratic equations
CO5: Identify the nature of roots of algebraic equations

CO6: Analyze and illustrate examples of different type of matrices

Subject: Calculus (BM 112)

At the end of the course, students will be able to

CO1: Familiarize with the definition of limits and its basic properties
CO2: Learn about continuous functions and types of discontinuity
CO3: Know about Differentiability, Successive differentiation and to apply Leibnitz Theorem, uses and applications of Maclaurin and Taylor series expansion
CO4: Study about asymptotes, singular points and curvature
CO5: Trace the curve in cartesian, parametric and polar co-ordinates
CO6: Learn and apply reduction formulae
CO7: Utilize curve tracing for rectification, quadrature, volumes and surfaces of solids of revolution

Subject: Solid Geometry (BM 113)

At the end of the course, students will be able to

CO1: Learn general equation of second degree and tracing of conics
CO2: Understand confocal conics and polar equations of a conic, tangents and normal to the conic
CO3: Study about Sphere, Cone, Cylinder
CO4: Know about central conicoids, equation of tangent plane, director sphere. Enveloping cone of coincoid
CO5: Learn the properties of Paraboloids, Circular section
CO6: Describe generating lines, Xonfocal conicoid. Reduction of second degree equation

Semester II
Subject: Number Theory and Trigonometry (BM 121)

At the end of the course, students will be able to

CO1: Learn the basic concepts of divisibility, primes, Fundamental theorems of arithmetic
CO2: Solve linear congruences and Diophantine Equations
CO3: Apply Fermat's Theorem, Chinese Remainder Theorem
CO4: Describe Quadratic residues, Greatest Integer Function, number-of-divisions function, sum of divisors function moebius function
CO5: Apply De Moivre's Theorem
CO6: Understand the circular and hyperbolic functions and their properties
CO7: Study about inverse circular and hyperbolic functions and their properties logarithm of a complex quantity, Gregory's series, summation of trigonometry series

Subject: Ordinary Differential Equation (BM 122)

At the end of the course, students will be able to

CO1: Understand geometrical meaning of differential equations and study exact differential equations
CO2: Solve first order higher degree equations, Lagrange's equation, Clairaut's equation
CO3: Know about orthogonal trajectories in both cartesion and polar co-ordinates
CO4: Study linear differential equation of second order and its reduction to normal form
CO5: Learn method of variation of parameters and method of undetermined coefficient
CO6: Study ordinary simultaneous differential equations, total differential equations

Subject: Vector-Calculus (BM 123)

At the end of the course, students will be able to

CO1: Know about the basic concept of vectors and their product
CO2: Be familiar with gradient of scalar point function and its characteristics
CO3: Learn about divergence and curl of vector point function and its characterization
CO4: Describe curvilinear co-ordinates in terms of cylindrical, cartesian and spherical co-ordinates
CO5: Find line integral, surface integral and volume integral
CO6: Analyze the problems based on Gauss divergence, Green's and Stoke's theorem

Subject: Advanced Calculus (BM 231)

At the end of the course, students will be able to

CO1: Understand continuity, sequential continuity and its properties
CO2: Learn about uniform continuity and chain rule of differentiability
CO3: Learn about Rolle's Theorem, Lagrange's Mean Value Theorem and their geometrical interpretation
CO4: Know about partial and total differentiation
CO5: Describe composite function and implicit functions
CO6: Understand the concept of differentiability of real valued functions of two variable
CO7: Know about the curves and their tangents, principle normals and binormals
CO8: Discuss the Bertrand curves and one parameter family of surfaces

Semester III
Subject: Partial Differential Equations (BM 232)

At the end of the course, students will be able to

CO1: Establish a fundamental familiarity with Partial Differential Equations
CO2: Distinguish between linear and non-linear partial differential equations

CO3: Find the complete integral, singular solution and general solutions
CO4: Solve linear and non-linear homogeneous and non-homogeneous equations with constant co-efficients and with variable co-efficient
CO5: Classify the linear partial differential equations of second order
CO6: Use method of separation of variables

Subject: Statics (BM 233)

At the end of the course, students will be able to

CO1: Understand the concept of composition and resolution of forces
CO2: Know about the moments and couples
CO3: Able to find the analytical conditions of equilibrium of co-planar forces
CO4: Be familiar with friction, centre of gravity, virtual work
CO5: Understand about forces in 3-D and Poinsot's central axis
CO6: Distinguish between stable and unstable equilibrium
CO7: Be familiar with wrenches, null lines and nullplanes

Semester IV
Subject: Sequence and Series (BM 241)

At the end of the course, students will be able to

CO1: Learn Boundedness, limit points, interior and closure of sets
CO2: Understand neighborhoods, isolated points, limit points and compact sets neighbourhoods
CO3: Learn about sequences and their convergence
CO4: Understand the concept of bounded and monotonic sequences
CO5: Learn the concept of infinite series, their convergence and divergence
CO6: Learn using 'Comparison Test' to determine the convergence and divergence of some series
CO7: Learn the concept of alternating series and arbitrary series

Subject: Special Functions and Integral Transforms (BM 242)

At the end of the course, students will be able to

CO1: Learn about power series and series solution of differential equations
CO2: Understand Bessel functions and orthogonality of Bessel's functions. Legendre and Hermite differential equations and their solutions
CO3: Study Laplace transforms, inverse Laplace transforms, Fourier transforms
CO4: Apply Laplace transformation and Fourier transformation to solve differential equations
CO5: Describe Legendre and Hermite functions and relation between Fourier transform and Laplace transform

Subject: Programming in C and Numerical Methods (BM 243)

At the end of the course, students will be able to

CO1: Be familiar with Programmer's model of a Computer, Algorithms, Flowcharts, Data type
CO2: Distinguish between logical and conditional statements
CO3: Know the implementation of loops, switch statement and case control statement
CO4: Understand the concept of Strings, Operations, Pointers, Arrays and Functions
CO5: Solve Algebraic and Transcendental equations by different methods
CO6: Find the solution of linear equations by Crout's, Gauss-Seidal's method

Semester V
Subject: Real Analysis (BM 351)

At the end of the course, students will be able to

CO1: Learn the fundamental theorem of Integral Calculus
CO2: Understand the mean value theorem of Integral Calculus
CO3: Learn the convergence of Improper Integrals
CO4: Learn Abel's and Dirichlet's test of convergence
CO5: Understand continuity, differentiability and integrability of an integral of a function
CO6: Understand the concept of Metric space
CO7: Learn Cantor's intersection theorem, Baire's category theorem
CO8: Understand continuous function, continuity in relation with compactness, connectedness
CO9: Learn Bolzano Weierstarss Property and Finite Intersection Property

Subject: Groups and Rings (BM 352)

At the end of the course, students will be able to

CO1: Be familiar with the concept of Groups, Subgroups, Cyclic groups, Cosets, Normal subgroups and Quotient groups
CO2: Learn about homeomorphisms, automorphism, isomorphism and inner automorphism
CO3: Learn the concept of permutation group, even and odd permutations, alternating groups, centre of group and derived group
CO4: Understand the concept of Rings, subrings, integral domains, fields, characteristics of ring and field of quotients of integral domain
CO5: Be familiar with Ring homomorphism, principal, maximal and prime ideals
CO6: Understand the concept of Euclidean rings, polynomial rings, Eisenstein's criterion

Subject: Numerical Analysis (BM 353)

At the end of the course, students will be able to

CO1: Learn about finite differences operators and their relations
CO2: Distinguish between Newton's forward and Newton's backward interpolation formulae
CO3: Study probability distribution of random variables, Binomial, Poisson's, Normal distributions
CO4: Solve Eigen value problems using different methods
CO5: Use different methods to find the numerical solution of ordinary differential equation
CO6: Solve numerical integration with the help of different rules and formulae

Semester VI
Subject: Real and Complex Analysis (BM 361)

At the end of the course, students will be able to

CO1: Learn Jacobians, Beta and Gamma functions, double and triple integrals
CO2: Understand Fourier series and its properties, half range series
CO3: Learn the extended complex plane and stereographic projections of complex numbers
CO4: Study continuity and differentiability of complex numbers, analytic functions and apply it to solve real life problems
CO5: Know mappings by elementary functions
CO6: Solve problem of conformal mapping, Mobius transformations, fixed points

Subject: Linear Algebra (BM 362)

At the end of the course, students will be able to

CO1: Be familiar with vector spaces, subspaces, finitely generated vector spaces
CO2: Understand the concept of basis and dimensions and existence theorem for basis
CO3: Study the concept of dual spaces, bidual spaces, null space, range space, rank and nullity
CO4: Know about linear transformations and matrices associated with them
CO5: Introduce the concept of Inner Product Spaces
CO6: Study orthogonality of vectors, orthogonal complements, orthogonal and orthogonal basis

Subject: Dynamics (BM 363)

At the end of the course, students will be able to

CO1: Know about velocity and acceleration along radial, transverse, tangential and normal directions

CO2: Learn about the concepts of Mass, Momentum and Force
CO3: Understand motion on smooth and rough plane
CO4: Be familiar with projectile motion of a particle in a plane and vector angular velocity
CO5: Know the basic concept of motion of a rigid body and a particle in 3-D
CO6: Study acceleration in terms of different co-ordinate systems

B.A.(Economics)

Semester I
Subject: Economics

At the end of the course, students will be able to

CO1: Understand the basics of economic variables
CO2: Define consumers and theories of consumer behaviour for attaining maximum satisfaction
CO3: Analyze producer behaviour and maximization of profits
CO4: Relate concepts of costs and revenue

Semester II
Subject: Economics

At the end of the course, students will be able to

CO1: Relate market structures, perfect competition and monopoly
CO2: Distinguish between monopolistic competition and oligopoly
CO3: Define market failure and market efficiency
CO4: Explain theories of distribution rent, wages, interest profit

Semester III
Subject: Macro-Economics

At the end of the course, students will be able to

CO1: Define national income of economy and compare the shares of different sectors in the economy
CO2: Understand the importance of investment function and consumption function for economy growth
CO3: Analyze the importance of government expenditure, tax and net export and their impact on national income
CO4: Give the knowledge about aggregate demand and aggregate supply and impact on national income through change in general price level

Semester IV
Subject: Economics

At the end of the course, students will be able to

CO1: Define money - demand and supply of money credit creation
CO2: Analyze IS-LM curve, trade cycle theories, models of economic growth - Samuelson Hicks model and Harrod and Domar model
CO3: Understand balance of payment concept and determination of exchange rate
CO4: Describe the concepts of public finance - effects of public expenditure, impact and incidence of taxes

Semester V
Subject: Knowledge of Indian Economy

At the end of the course, students will be able to

CO1: Understand the nature of Indian and world economy
CO2: Analyze different economic policies
CO3: Conduct statistical analysis of data
CO4: Apply economic theories and concepts to contemporary social issues like poverty, unemployment, regional imbalances etc. as well as formulation and analysis of policy
CO5: Demonstrate the ability to employ the economic way of thinking
CO6: Gain awareness of global, historical and institutional forces
CO7: Develop awareness of career choices

Semester VI
Subject: International Trade

At the end of the course, students will be able to

CO1: Know different theories of trade
CO2: Analyze exchange rate and exchange control policies
CO3: Develop interest in composition direction value and volume of international trade
CO4: Inculcate interest in international organizations like IMF, IBRO, SARC and SAPTA

B.A.(History)

Semester I
Subject: History of India (Earliest Times to C 1200 A.D.) (HR-01)

At the end of the course, students will be able to

CO1: Identify and describe the emergence of the earliest civilizations in India: the Harappan and Aryan societies in the Indian sub-continent
CO2: Analyze the Buddhist and Vedic (Hindu) faiths
CO3: Understand the emergence of the Mauryan and Gupta empires during the 'classical age' in India
CO4: 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 and Extent of Harshavardhana's Empire

Semester II
Subject: History of India (1200 A.D. to 1707 A.D.) (HR-02)

At the end of the course, students will be able to

CO1: Understand the rise and expansion of Delhi Sultanate
CO2: Analyze Mughal rule, administrations, art, and architecture
CO3: Identify cultural synthesis in Delhi Sultanate and Mughal rule
CO4: 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
Subject: History of India (1707 A.D. to 1947 A.D.) (HR-03)

At the end of the course, students will be able to

CO1: Evaluate consolidation of English Power in India
CO2: Understand social religious consciousness in British India
CO3: Analyze various economic policies in British India
CO4: Have inter-comparison of Nationalist movements - Pre - Gandhian and Post - Gandhian Era
CO5: Understand 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
Subject: History of Haryana (from earliest times to 1947 A.D.) (HR-04)

At the end of the course, students will be able to

CO1: Have the description of political and cultural activities of Haryana during ancient and medieval period
CO2: Understand early resistance British East India Company and the mutiny of 1857
CO3: Classify socio-religious movement in Haryana
CO4: Acquire knowledge about Praja Mandal Movement and Chotu Ram's Unionist Party

CO5: 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
Subject: Ancient and Medieval World (HR-05)

At the end of the course, students will be able to

CO1: Identify and define the world's earliest civilizations, including the Neolithic Revolution, and describe how it shaped the development of these early civilizations
CO2: Describe and compare/contrast the first advanced civilizations in the world - Mesopotamia and Egypt
CO3: Describe the characteristics of the Roman Kingdom, the Roman Republic, and Imperial Rome
CO4: 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
CO5: Understand the maps of important sites of Bronze Age Civilization, main centres of Greek Civilization, formation of empire under Abbasides

Semester VI
Subject: Modern World (HR-06)

At the end of the course, students will be able to

CO1: Classify growth of mercantilism and capitalism
CO2: Analyze and describe the development of agricultural and industrial revolutions
CO3: Analyze the classification development of democracy in England, France, Italy and Germany
CO4: Acquire knowledge about Russian revolution and Chinese revolution
CO5: Understand world maps - area of agricultural revolution, Europe on the eve of French revolution, unification of Italy and Germany

B.A.(Geography)

Semester I
Subject: Geography of India

At the end of the course, students will be able to

CO1: Understand the physical features of India
CO2: Understand and describe the population and migration
CO3: Understand, describe and classify the resources available in India

Subject: Maps and Scales (Practical)

At the end of the course, students will be able to

CO1: Understand the concept of cartography and map
CO2: Describe and classify the maps and scale
CO3: Understand and describe the measurement of distances and areas on maps

Semester II
Subject: Geomorphology

At the end of the course, students will be able to

CO1: Understand physical geography and identify the physical features on earth
CO2: Gain knowledge of the foundation and theories of physical geography
CO3: Understand the concept of weathering and mass-movements
CO4: Identify the factors of erosion

Subject: Representation of physical features (Practical)

At the end of the course, students will be practically able to

CO1: Understand the methods of representing relief
CO2: Understand the various landforms with the help of contours
CO3: Classify the different profiles

Semester III
Subject: Physical Geography (Atmosphere and Oceanography)

At the end of the course, students will be able to

CO1: Understand global atmospheric circulations and disturbances
CO2: Understand world climate systems, climatic variability and change
CO3: Sensitize the students with the future global environmental changes
CO4: Understand weather phenomena - winds, humidity and precipitation

Subject: Representation of Climatic Data (Practical)

At the end of the course, students will be able to

CO1: Understand the measures of temperature, rainfall, pressure and humidity through graph
CO2: Interpret and describe the weather map
CO3: Understand the techniques of mapping large scale maps

Semester IV
Subject: Maps Projection (Practical)

At the end of the course, students will be able to

CO1: Understand the term map projection, altitude and longitude lines
CO2: Identify the various techniques of drawing map projection
CO3: Understand the techniques of mapping large scale map

Subject: Human Geography

At the end of the course, students will be able to

CO1: Define human geography, its nature and scope
CO2: Describe the classification of resources, its distribution and importance of their conservation
CO3: Analyze the world population patterns
CO4: Understand and become aware of population problems, resource use and environmental degradation

Semester V
Subject: Economic Geography

At the end of the course, students will be able to

CO1: Study human economic activities
CO2: Understand mineral and power resources
CO3: Study of the distribution of engineering, cotton sugar industries in India
CO4: Study of India or Foreign Trade

Subject: Distribution maps and diagrams (Practical)

At the end of the course, students will be able to

CO1: Understand principles of map design or layout
CO2: Understand symbolization
CO3: Do prismatic compass survey

Semester VI
Subject: Remote Sensing, GIS and Quantitative Methods

At the end of the course, students will be able to

CO1: Describe aerial photographs, their types and understand the interpretation of aerial photographs
CO2: Understand the remote sensing techniques and their applications in agriculture and resource mapping
CO3: Understand the GIS and correlation of GIS techniques in various fields of geography
CO4: Understand the statistical techniques to analyze the geographical data

Subject: Intro to Remote Sensing and Field Survey Reports

At the end of the course, students will be able to

CO1: Identify physical and cultural features of aerial photograph
CO2: Identify the features on satellite agency LISS III or FCC
CO3: Understand the basic socio-economic characteristics of chosen students serving college
CO4: Build the capability of writing a report for research work

B.A.(Political Science)

Semester I
Subject: Indian Constitution

At the end of the course, students will be able to

CO1: Understand the basic features of the Indian constitution, fundamental rights and duties
CO2: Know the basic structure of Government at Centre and State Level
CO3: Describe the Parliamentary form of Govt. and Legislative process in India
CO4: Understand the Judiciary system of India

Semester II
Subject: Indian Politics

At the end of the course, students will be able to

CO1: Understand the basic structure of Indian Federalism
CO2: Know the electoral process of India
CO3: Identify the national and regional political parties of India
CO4: Understand the various political problems of India just as caste, religion, language and regionalism

Semester III
Subject: Principles of Political Science

At the end of the course, students will be able to

CO1: Define Political Science and relation of Political Science to other Social Sciences
CO2: Describe the theories of the origin of the State
CO3: Learn the functions of State and concept of the welfare state
CO4: Know and understand the concept of sovereignty and the theories of sovereignty

Semester IV
Subject: Principles of Political Science

At the end of the course, students will be able to

CO1: Know the concepts and theories of rights, duties and universal declaration of human rights
CO2: Understand the concept and theories of liberty and equality
CO3: Realize the concept of social change and development
CO4: Be aware of RTI and consumer protection

Semester V
Subject: Comparative Politics

At the end of the course, students will be able to

CO1: Define comparative politics and methods
CO2: Understand the different approaches to the study of comparative politics
CO3: Know the constitutionalism and the difference between constitution and constitutionalism
CO4: Be aware of constitutional structures and informal structures

Semester VI
Subject: Comparative Constitutions of UK and USA

At the end of the course, students will be able to

CO1: Know the basic features of the constitutions of UK and USA
CO2: Understand comparative study of Executive, Legislature and Judiciary of UK and USA
CO3: Have knowledge of different political parties and pressure groups of UK and USA
CO4: Define and explain electoral process, voting behaviour and bureaucracy of UK and USA

B.A.(Psychology)

Semester I
Subject: Introduction to Psychology

At the end of the course, students will be able to

CO1: Know more about psychology, its background, subject matter
CO2: Know more about the methods of psychology
CO3: Learn about the structure of human eye and ear and learn more about physiological psychology
CO4: Know more about the perception, emotion and motivational concept s
CO5: Know about the personality and intelligence also
CO6: Students would be able to practically understand major topics of psychology and psycho physics

Subject: Introduction to Psychology (Practical)

At the end of the course, students will be able to practically gain the knowledge regarding

CO1: What is Personality and how is it measured by EPI test ?
CO2: What is emotion and how we can measure the emotions with the help of study of emotions ?
CO3: What is Intelligence and how we can measure Intelligence with the help of Verbal Intelligence Test ?
CO4: Simple reaction time
CO5: What is observation and how can we measure the speed and accuracy of the observation ?
CO5: How an individual is motivated by the social and individual factors ?

Semester II
Subject: Psychology

At the end of the course, students will be able to

CO1: Learn about attention
CO2: Know more about learning and memory
CO3: Understand the psychological necessity of problem solving
CO4: Know more about statistics, Graphic representation, mean, median mode
CO5: Have practical knowledge about short term and long term memory

Subject: Introduction to Psychology (Practical)

At the end of the course, students will be able to practically know about

CO1: Serial-position effect
CO2: Short term memory
CO3: The long term memory and how we can measure the time period of L.T.M.
CO4: The ability of problem solving, and how can we improve this ability
CO5: The span of attention
CO6: Transfer of learning and learn about maze learning

Semester III
Subject: Social Psychology

At the end of the course, students will be able to

CO1: What is social psychology and what actually is socialization
CO2: In a social group what are social norms and the leadership types
CO3: How is attitude developed and how does it change
CO4: What are prejudices and stereotypes
CO5: How is prosocial behaviour helpful and what is aggression and how one can prevent aggressive behaviour

Subject: Social Psychology (Practical)

At the end of the course, students will be able to able to know

CO1: About is altruism and how it is measured
CO2: Several Stereo types found in society
CO3: Aggression and means of reduction
CO4: Leadership styles
CO5: About Social conformity
CO6: Facilitation of Individuals in Society

Semester IV
Subject: Developmental Psychology

At the end of the course, students will be able to able

CO1: To know about Parent-Child relationship and with which parent the bond is strong
CO2: To know about the problems of youth
CO3: What is self esteem and how is it earned ?
CO4: To know about the environment of the family and how does it effect an individual
CO5: To know how values are inculcated
CO6: Study cases on any of the recent issues arising in developmental Psychology

Subject: Developmental Psychology (Practical)

The students will be understanding the given issues while studying Developmental Psychology

CO1: What is human development and factors affecting human development ?
CO2: What are the stages during prenatal development and what particular hazards occur during infancy ?
CO3: What are the main developmental features during childhood ?
CO4: Problems of adolescents and coping with them
CO5: What is adulthood, its stages and how people adjust with the aging process ?
CO6: Some basics of Statistics

Semester V
Subject: Psychopathology

At the end of the course, students will be able to

CO1: Understand maladjusted behaviour
CO2: Understand that mental illness can be treated in the same manner as physical illness
CO3: Spread awareness in society regarding mental disorders as it is considered a social stigma
CO4: Understand the effects of physical factors in physical illness
CO5: Able to analyze the deadly effects of drug addiction
CO6: Help in choosing their careers in psychology as clinical psychologist

Subject: Psychology (Practical)

Mental Depression Scale: Enables the students to examine the depression level of the subject
PGI - Memory Scale: The test is designed to evaluate different types of memory of the patients/subject
Emotional Intelligence Inventory
The test enables the students to study emotional Intelligence of the subject genre i.e. Intrapersonal awareness, Interpersonal awareness, Interpersonal management and Intrapersonal management of emotions
State-Trait Anxiety Test: The students measure the state and trait anxiety levels of the subjects
Thematic-Apperception Test: The test is designed to study the personality of the subject. Students learn to do administration and scoring to study the personality
WAIPS: The test enables the students to measure IQ of the subject with non-verbal material

Semester VI
Subject: Applied Psychology

At the end of the course, students will be able to

CO1: Understand the utility of psychology in everyday life
CO2: Understand the concept of health, illness and general well being
CO3: Identify stressors and how to cope with these stressors
CO4: Give them a clean picture of life-style disorders
CO5: Help them become good counsellors
CO6: Understand the importance of psychology in low and court

Subject: Psychology (Practical)

At the end of the course students will gain knowledge on the topics that follow:

Well-being Scale: Students are evaluated to administer the scale on different subjects and try to find out subject's aspects of General - well being
Life Style Schedule: The given schedule enables the students to examine the life style of the subject and the disorclers related to life-style
Aptitude Scale: Aptitude of the subject is measured with the scale so that the subject can choose his/her streams according to the results by the student
Stress Scale: Stress-level of the subject and the causes of different types of stresses will be identified
Counseling Need Inventory: It helps the subject whether he/she needs any type of counselling
Adjustment Inventory: Adjustment of the subject is examined in fine different areas i.e. home, health, education, social and occupational areas

B.A.(Home Science)

Semester I
Subject: Home Management

At the end of the course, students will be able to

CO1: Understand the concept of Home Science, definition, meaning and scope of Home Science
CO2: Increase their knowledge about Housing-functions of Home, selection of site for an ideal house - soil, locality and orientation
CO3: Provide direction of kitchen garden - meaning and utility of kitchen garden, planning and raising of kitchen garden
CO4: Strengthen the use of element of art - line, texture, form, texture size, shape and colour

CO5: Provide direction of art - harmony, balance, proportion, rhythm, emphasis in relation to interior decorators and flower arrangement
CO6: Get information about Home management, process of home management - planning, controlling and evaluation, classification of human and material resources
CO7: Learn about the consumer protection act - rights and duties of consumers
CO8: Get information about Time Management, process of time management, time plans, peak loads, rest periods
CO9: Get acquainted with energy management, process of energy management, fatigues and its types

Subject: Resource Management (Practical)

At the end of the course, students will be able to

CO1: Learn cleaning and polishing of household metals - Brass, Copper, Silver and aluminum
CO2: Understand about preparation of monthly budget for various income groups
CO3: Master table setting and table manners
CO4: Know about care and cleaning of household equipments

Semester II
Subject: Hygiene and Applied Science

At the end of the course, students will be able to

CO1: Know about the meaning of Health education, soil hazards of modern age - air, water, soil and noise pollution
CO2: Get information about water - importance of water, impurities of water, sources of contamination and purification of water
CO3: Develop an awareness about infection, infective agents, infections disease communicable diseases, incubation period, mode and transmission
CO4: Increase their knowledge about diseases like : Malaria, Enteric Fever, Dysentery, Cholera, Measles, Mumps, Diphtheria Leprosy
CO5: Provide direction about Transmission of heat - elementary ideas about transmission of heat and their application in daily life, clothes, utensils, fire place
CO6: Learn about thermometer and J scale of measurement, simple conversion - Centigrade to Fahrenheit

Subject: Home Management (Practical)

At the end of the course, students will be able to

CO1: Learn Flower arrangement for different occasions
CO2: Know the knack pottery painting and decoration
CO3: Repairing fuse and plugs

CO4: Prepare articles for interior decoration
CO5: Prepare charts in relation to personal hygiene

Semester III
Subject: Clothing and Textiles

At the end of the course, students will be able to

CO1: Get information about Fibers, its properties and use of different fibers
CO2: Know about the basic weaves, different types of finishes, type of printing and dyeing
CO3: Get information about selection of fabrics, traditional embroideries and traditional sarees of India
CO4: Know about the supplies necessary for laundry, different methods of laundry, detergents and stain removal, its methods, type of stains

Subject: Clothing and Textiles (Practical)

At the end of the course, students will be able to

CO1: Understand various garment sewing techniques like basic stitches: tucking running stitches, back stitch, hemming, button hale stitch. Seam: Plain seam, french seam, counter seam, lepped seam, Dart, pleats, tucks, placket opening
CO2: Learn about various tie and dye techniques
CO3: Prepare the Sample: block printing
CO4: Prepare articles of fancy embroidery using at least four stitches
CO5: Prepare two samples of knitting

Semester IV
Subject: Human Physiology

At the end of the course, students will be able to

CO1: Get information about the animal cell and skeletal system and their types, structure and function
CO2: Know about the digestive system, excretory system, their function and structure
CO3: Get information about the circulatory system
CO4: Know about the reproductive system, mensturation, fertilization, pregnancy, lactation

Subject: Clothing and Textiles

At the end of the course, students will be able to

CO1: Learn taking body measurements
CO2: Prepare drafting and stitching of Child's bodies block and its adaptation to a gathered frock and Adult's body block

CO3: Prepare Drafting and Stitching of the following garments (i) Gathered frock (ii) Petticoat (iii) Salwar and Kamiz or Blouse
CO4: Learn about the different parts of sewing machine, its care, defects and remedies

Semester V
Subject: Food and Nutrition

At the end of the course, students will be able to

CO1: Know about food classification and functions of foods and food groups
CO2: Promote essential food constituents : carbohydrates, proteins, fats, water, sources : functions, recommended daily allowances
CO3: Provide the knowledge of vitamins and minerals
CO4: Strengthen the importance of cooking, effect of cooking in different food groups, methods of cooking like boiling, stewing, roasting, baking, frying, microwave cooking in brief
CO5: Get information about methods of enhancing nutritive value of food stuffs like sprouting, germination, fermentation, supplementation
CO6: Learn about food preservation - importance, and causes of food spoilage
CO7: Increase their knowledge about meal planning, concept of meal planning, principle and factor affecting of meal planning
CO8: Understand the knowledge about planning meals for children - school going child, adolescents, adults, pregnant and lactating mother

Subject: Food and Nutrition (Practical)

At the end of the course, students will be able to prepare various dishes using -

a) Beverages
b) Soups
c) Desserts
d) Snacks
e) Breakfast Dishes
f) Main meal dishes

Semester VI
Subject: Child Psychology and Mother Craft

At the end of the course, students will be able to

CO1: Get information about the child psychology, its definition, aims, subject matter and objectives
CO2: Increase their knowledge about learning : what is learning, its importance, methods of learning, factor affecting of learning, role of reward and punishment
CO3: Provide direction about personality development - nature, development of personality, definitions, types of personality, factor affecting the development of personality

CO4: Promote the stages of development of the child, characteristics and problems of adolescents, role of parents and teacher solving their problems
CO5: Understand about expectant mother and signs of pregnancy, discomforts of pregnancy and ill-effects of an early marriage
CO6: Learn about common ailments of childhood like - cold, cough, fever and digestive disturbance like - Diarrhea, constipation and vomiting

Subject: Child Psychology and Mother Craft (Practical)

At the end of the course, students will be able to know

CO1: Planning and Preparation of meals for
a. a school going child
b. adolescents - boys, girls
c. adults
d. pregnant and lactating mother
CO2: Learn how to prepare and preserve - Pickle, Chutney, Jam, Squash, Murrabba

B.A.(Music (Vocal))

Semester I
Subject: Music (V)

At the end of the course, students will be able to
CO1: Know about the Raag, meaning of Notation, why and how Khayal is created and applied in Raag
CO2: Know the use of Alaps and how to apply with Taal, Use of Alankaar in Raags
CO3: Give a scale to voice Alankaar
CO4: Basic knowledge of music aspects
CO5: How to use Taal, and why Taal is used in our Singing
CO6: Types of song like Lakshan Geet
CO7: Gain the knowledge of Notation of Drut Khayal

Semester II
Subject: Music (V)

At the end of the course, students will be able to know

CO1: Why Tanpura and Harmonium are used in Music ?
CO2: Change in Alap gaan presentation
CO3: How to apply Taal in classical singing ?
CO4: Notation level about role of music
CO5: How to come on stage to give presentation ?

Semester III
Subject: Music (V)

At the end of the course, students will be able to

CO1: Know about Aroh Avroh and how it is urgent to gain the knowledge about Raag
CO2: Know about different gayan shailies
CO3: Know how the song relates to Raag
CO4: Sign with strong lyrics slow lays and controlling
CO5: How to apply Alankars in mentioned Raags

Semester IV
Subject: Music (V)

At the end of the course, students will be able to

CO1: Correlate to Raags
CO2: Know how to apply swar in song and Raag
CO3: Other different shalies (Gayan) and where Shalies are applied
CO4: Use Tanpura classical music
CO5: Light Music Taals like Rupal, Dadra Taal helps us to sing

Semester V
Subject: Music (V)

At the end of the course, students will be able to

CO1: Maintain Rhythm/layakari with the help of vilamtrit and drut
CO2: The role of Gharana's Prampara and how it is applied presently
CO3: The use of sing vilantrit and drut in sangeet
CO4: The types of Folk singing (learn Punjab folk singing by following the given syllabus)

Semester VI
Subject: Music (V)

At the end of the course, students will be able to

CO1: Know the role of notation and singing in Swars
CO2: Gharana system merits and demerits how it is important in present scenario
CO3: Know how Bhim Plasi, Patdeep and Madhu correlate with each other, and its use in ragas
CO4: Know what's Dhamar gayan shallie/knowledge/and how it is sung in Dhamar Taal
CO5: Know what is the difference between Dhrupad and Dhamar gayan shallies

Programme Name - B.A.(Hons.)Geography

Programme Outcomes of B.A.(Hons.) Geography

PO1: Students will develop a competency in of their concepts of 'space', 'place' and 'region' and their importance in explaining world affairs
PO2: Students will understand general demographic principles and their patterns at regional and global scales
PO3: Students will be able to locate on a map major physical features, cultural regions and individual states and urban centres
PO4: Students will understand global and regional patterns of cultural, political and economic institutions and their effects on the preservation, use and exploitation of natural resources and landscapes

Programme Specific Outcomes of B.A.(Hons.) Geography

PSO1: Students will have a general understanding a geomorphological and geo-technical process and formation
PSO2: Advance knowledge of Human Geography and its co-relation with practical life will be acquired
PSO3: Students will be able to acquire primary data after learning the skills to use various modern tools and instruments
PSO4: The students will learn application of GIS and modern Geographical Map making techniques
PSO6: Students will understand the usage acquired knowledge in society and environmental contexts and demonstrate the knowledge for continuous development of society

Semester I
Subject: Introduction to Geography (101)

At the end of the course, students will be able to

CO1: Acquaint themselves with philosophy, methodology and historical development of geography in professional field
CO2: Address the spirit and purpose of the changing geographics and we as geographers contribute towards knowledge production

Subject: Fundamentals of Physical Geography (102)

At the end of the course, students will be able to

CO1: Sensitize the students with future global environmental changes
CO2: Understand the global atmospheric circulations and disturbances

CO3: Understand the world climatic systems, climatic variability and change

Subject: Subsidiary Paper (Political Science) (104)

At the end of the course, students will be able to

CO1: Understand the basic features of the Indian constitution, fundamental rights and duties
CO2: Know the basic structure of Government at Centre and State Level
CO3: Describe the Parliamentary form of Govt. and Legislative process in India
CO4: Understand the Judiciary system of India

Subject: General Cartography (Practical) (105)

At the end of the course, students will be able to

CO1: Understand the importance and uses of maps
CO2: Draw various diagrams through computer

Semester II
Subject: Ecology and Environment (201)

At the end of the course, students will be able to

CO1: Know the importance of biodiversity to maintain ecological balance
CO2: Understand the linkages between environment and biomes
CO3: Familiarize with converging and forming our biosphere

Subject: Fundamentals of Human Geography (202)

At the end of the course, students will be able to

CO1: Know human races of different regions of the world
CO2: Know the relationship between humans and environment
CO3: Know the distribution of minerals

Subject: Subsidiary Paper (Political Science) (204)

At the end of the course, students will be able to

CO1: Understand the basic structure of Indian Federalism
CO2: Know the electoral process of India
CO3: Identify the national and regional political parties of India
CO4: Understand the various political problems of India just as caste, religion, language and regionalism

Subject: Representation of Physical Features (Practical) (205)

At the end of the course, students will be able to

CO1: Know the landforms of earth
CO2: Know the scale of map and methods of representation of scale

Semester III
Subject: Geomorphology (301)

At the end of the course, students will be able to

CO1: Understand various aspects of landform growth and evolution on the earth
CO2: Understand the relevance of applied aspects of geomorphology in various fields
CO3: Explain the basic conceptual and dynamic concepts of landforms development

Subject: Regional Development (302)

At the end of the course, students will be able to

CO1: Know about the regional development and planning process in India
CO2: Understand and evaluate the concept of region in geography
CO3: Get familiarized with the theoretical foundations and conceptual grounding of this branch

Subject: Geography of India(303)

At the end of the course, students will be able to

CO1: Understand the geographical aspects of India
CO2: Have knowledge about Indian sub continent contemporary issues
CO3: Understand demographic aspects of India

Subject: Subsidiary Paper (Political Science) (304)

At the end of the course, students will be able to

CO1: Define Political Science and relation of Political Science to other Social Sciences
CO2: Describe the theories of the origin of the State
CO3: Learn the functions of State and concept of the welfare state
CO4: Know and understand the concept of sovereignty and the theories of sovereignty

Subject: Thematic Cartography (Practical) (305)

At the end of the course, students will be able to

CO1: Prepare good quality maps
CO2: Take up career in the field of digital cartography
CO3: Have knowledge about computer aided cartography

Semester IV
Subject: Climatology (401)

At the end of the course, students will be able to

CO1: Understand the global atmospheric circulations and disturbances
CO2: Sensitize the students with the future global environmental changes
CO3: Understand the world climate systems, climatic variability and change

Subject: Population Geography (402)

At the end of the course, students will be able to

CO1: Know the theories of population
CO2: Know how to calculate sex data, growth rate, mortality, fertility
CO3: World pattern of population

Subject: Statistical Techniques in Geography (403)

At the end of the course, students will be able to

CO1: Describe and explain geographical data relationships
CO2: Explain the nature and types of data and related statistical techniques
CO3: Make a relation choice amongst listed various statistical techniques

Subject: Subsidiary Paper (Political Science) (404)

At the end of the course, students will be able to

CO1: Know the concepts and theories of rights, duties and universal declaration of human rights
CO2: Understand the concept and theories of liberty and equality
CO3: Realize the concept of social change and development
CO4: Be aware of RTI and consumer protection

Subject: Basic Principles of Land Surveying (Chain-Tape) (Practical) (405)

At the end of the course, students will be able to

CO1: Know the importance of land survey and how can we measure the field
CO2: Learn the land surveying techniques

Semester V
Subject: Modern Geographical Thought (501)

At the end of the course, students will be able to

CO1: Acquaint with the philosophy, methodology and historical development of geography as a professional field
CO2: Address the spirit and purpose of the changing geographies and to what as geographer, one can contribute towards knowledge production
CO3: Critically look at the contents of other courses at Post graduates level as witnessed in the distant and recent past

Subject: World Regional Geography (502)

At the end of the course, students will be able to

CO1: Understand and evaluate the concept of Region in geography
CO2: Know about the regional development and planning process in India
CO3: Get familiarized with the theoretical foundations and conceptual grounding of this branch

Subject: Agricultural Geography (503)

At the end of the course, students will be able to

CO1: Have an understanding of agricultural geography as a developed branch of geography
CO2: Learn major concepts, factors affecting agricultural land use, agricultural system of the world and the emerging scenario in agriculture

Subject: History (504)

At the end of the course, students will be able to

CO1: Identify and define the world's earliest civilizations, including the Neolithic Revolution, and describe how it shaped the development of these early civilizations
CO2: Describe and compare/contrast the first advanced civilizations in the world - Mesopotamia and Egypt

CO3: Describe the characteristics of the Roman Kingdom, the Roman Republic, and Imperial Rome
CO4: 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
CO5: Understand the maps of important sites of Bronze Age Civilization, main centres of Greek Civilization, formation of empire under Abbasides

Subject: Map Projections, Prismatic Compass Surveying and Field Report (Practical) (505)

At the end of the course, students will be able to

CO1: Know the importance of map projection and classification of maps
CO2: Know how we can measure the field with the help of PCs
CO3: Know how we can do socio-economic survey

Semester VI
Subject: Oceanography (601)

At the end of the course, students will be able to

CO1: Know about ocean human interface including weather, climate, navigation, security and resource, utilization
CO2: Understand the dynamics of ocean physiography
CO3: Have knowledge of oceans as a resource in times to come

Subject: Economic Geography (602)

At the end of the course, students will be able to

CO1: Understand in an increasingly globalized world economic activities occur unevenly over geographical and face
CO2: Know how local places and global economy are intertwined
CO3: Describe the regime of neoliberal policies are generating uneven geography of capitalist development

Subject: Industrial Geography (603)

At the end of the course, students will be able to

CO1: Know about the establishment, growth, distribution of industries
CO2: Know the theories related to industries
CO3: Know the distribution of minerals in the world

Subject: Subsidiary Paper (History) (604)

At the end of the course, students will be able to

CO1: Classify growth of mercantilism and capitalism
CO2: Analyze and describe the development of agricultural and industrial revolutions
CO3: Analyze the classification development of democracy in England, France, Italy and Germany
CO4: Acquire knowledge about Russian revolution and Chinese revolution
CO5: Understand world maps - area of agricultural revolution, Europe on the eve of French revolution, unification of Italy and Germany

Subject: Fundamentals of Remote Sensing (Practical) (605)

At the end of the course, students will be able to

CO1: Know about various aspects of aerial photogrammetry
CO2: Get familiarized with various models and theories related to transport network
CO3: Understand geographic relevance of transportation

Programme Name - B.Com.(Pass)

Programme Outcomes of B.Com.(Pass)

After becoming graduates in Commerce programme students would become aware of the fundamentals of Commerce and Finance resulting in

PO1: Developing an attitude to work effectively and efficiently in a business environment
PO2: Inculcating a professional attitude and develop decision taking aptitude in students
PO3: Strengthening the base and basics of knowledge in different branches of Commerce
PO4: Practical ability to apply knowledge, skills and techniques used in Commerce
PO5: Enabling them to manage the financial issues with technical knowledge and support
PO6: Strengthening the foundation of their knowledge of Commerce and Financial fields
PO7: Integrating the concepts and techniques used in Commerce with their efficiency in business development

Programme Specific Outcomes of B.Com.(Pass)

PSO1: The graduates in Commerce will be able to go for Higher Studies in Chartered Accountancy to become certified Auditors
PSO2: Students can opt for a career to guide investors in financial planning or as stock brokers
PSO3: Commerce graduates may also gain expertise as marketing professional in banking sector or for insurance companies
PSO4: Commerce students may become Tax Savvy as TR preparers
PSO5: The graduates in Commerce can opt for a course in company secretaries and become legal advisors to companies
PSO6: Students may also acquire practical skills to work for providing financial support services

Semester I
Subject: Financial Accounting-I (1.01)

At the end of the course, students will be able to

CO1: Learn about the meaning, objective, process, limitations, basic terms of accounting, generally accepted accounting principles
CO2: Maintain journal, ledger and prepare trail balance
CO3: Differentiate between capital and revenue items, reserves and provisions
CO4: Learn about the concept of depreciations, causes, accounting procedure under different methods
CO5: Recognize the different types of errors and rectifying them
CO6: Prepare final accounts with adjustments

CO7: Know about the meaning, features and accounting treatment of non-profit organizations
CO8: Know about the meaning of consignment and how to maintain consignment accounts

Subject: Business Mathematics-I (1.02)

At the end of the course, students will be able to

CO1: Understand indices and logarithms
CO2: Describe union, intersection, complement and difference of sets
CO3: Apply set theory to practical problems
CO4: Be familiar with presentation and combinations
CO5: Study about sequence and series
CO6: Learn about data interpretation
CO7: Analyze the practical problems with bare graphs, pie charts, line graphs, mix graphs

Subject: Business Economics-I (1.03)

At the end of the course, students will be able to

CO1: Define basic concepts of economy, price mechanism elasticity of demand and supply
CO2: Describe the theories of production, function in start and long run, ridge lines, theory of cost
CO3: Understand consumer behaviour, utility and indifference curve analysis
CO4: Understand markets - classification and structure

Subject: Business Management-I (1.04)

At the end of the course, students will be able to

CO1: Describe the concept, nature and objectives of Business including business systems
CO2: Discuss about management concept, nature and significance
CO3: Explain in detail the management thoughts or systems
CO4: Learn about the planning and decision making concepts and process including MBO
CO5: Evaluate the steps of corporate planning and strategy formulation
CO6: Demonstrate the ability to understand the concepts related to organizing such as authority and responsibility, centralization and decentralization including departmentalization and organizational structure

Subject: Business Communication Skills (1.05)

At the end of the course, students will be able to

CO1: Know about the process of communication and barriers to communication
CO2: Learn the E-mail etiquettes and how to note down the minutes of meetings

CO3: Practice the report writing
CO4: Know and read the body language and gestures

Subject: Basic of Computer-I (1.06)

At the end of the course, students will be able to

CO1: Know about the components of computers, and various generations of computers
CO2: Differentiate between human being and computer, computer and calculator
CO3: Understand the various types of computers according to classification criteria
CO4: Know about various input devices, output devices and various memory and mass storage
CO5: Create MS-Word document with various formatting options

Subject: Basic of Computer-I (Practical) (1.06)

At the end of the course, students will be able to

CO1: Create MS-Word documents with various formatting options
CO2: Know about the various components of MS-Word
CO3: Know about how to edit, save, import and export files
CO4: Create the tables with various options available within
CO5: Implement the features like macors, mail merge, etc.

Semester II
Subject: Financial Accounting-II (2.01)

At the end of the course, students will be able to

CO1: Learn about the meaning of hire purchase system installment payment system and accounting procedure of HPS and IPS
CO2: Know about the meaning of branch and departmental A/c and to maintain the accounts of branches and departments
CO3: Know about the concept of dissolution of partnership, Garner V/s Murrey Rule, Gradual realization and piecemeal distribution
CO4: Know the concept of amalgamation and sale of partnership firm
CO5: Learn how to maintain accounts in case of dissolution of partnership and sale of partnership firm
CO6: Know the concept of joint venture account and royalty and learn how to maintain accounts in case of joint venture and royalty

Subject: Business Mathematics-II (2.02)

At the end of the course, students will be able to

CO1: Learn about matrices and determinants
CO2: Solve system of linear equations having unique solution and involving not more than three variables
CO3: Understand application of differentiation
CO4: Find compound interest and present value and amount of an amenity
CO5: Be familiar with ratio and proportion
CO6: Understand the concept of profit and loss and their practical application

Subject: Business Economics-II (2.03)

At the end of the course, students will be able to

CO1: Understand about market structures i.e. perfect competitive monopoly, monopolistic competition, oligopoly and price determination in different markets
CO2: Understand the concept of market structure and market failure
CO3: Understand market success and market failure
CO4: Understand theory of factor pricing and how different factors of production will get their reward
CO5: Know about the concept of rent, wages, interest and profits separately

Subject: Business Management-II (2.04)

At the end of the course, students will be able to

CO1: Describe the nature, concept and scope of staffing including concept of matching job and people and making students understand the concept of recruitment, selection and training of employees in detail
CO2: Explain in detail the motivation concept, theories and its types
CO3: Explain in detail the leadership concept, styles and theories
CO4: Discuss about the communication concept, nature, types and process, barriers and remedies
CO5: Explain in detail the controlling concept, process, techniques and effective control system
CO6: Understand the concepts, nature and process of planned change, resistance to change, emerging horizons to change faced by managers

Subject: Business Environment (2.05)

At the end of the course, students will be able to

CO1: Learn the practical implications of SWOT Analysis

CO2: Know about the measures of National income and GDP of developing nations
CO3: Know about the ways to eliminate the evils of poverty and unemployment
CO4: Evaluate the LPG policy of India

Subject: Basic of Computer-II (2.06)

At the end of the course, students will be able to

CO1: Know about functioning of digital computer and model of digital computer
CO2: Understand the applications of computer in various fields
CO3: Know about software, operating systems and their types
CO4: Know about windows and its various components
CO5: Create MS-Excel sheets with various excel features available

Subject: Basic of Computer-II (Practical) (2.06)

At the end of the course, students will be able to

CO1: Know about the various components of MS-Excel window
CO2: Create worksheet using different formatting options
CO3: Design tables and create chart according to table
CO4: Use various Built-in functions like mathematical and logical

Subject: Environmental Studies

At the end of the course, students will be able to

CO1: Correlate the factors of eco system
CO2: Pay attention towards their environment
CO3: Know the need to conserve and preserve the natural resources
CO4: Develop the skills to enhance the quality of their environment
CO5: Understand the variation among organisms through biodiversity
CO6: Analyze the population growth and work upon the idea and schemes to control it
CO7: Figure out the impacts of nature (environment) on living organisms

Semester III
Subject: Corporate Accounting-I (3.01)

At the end of the course, students will be able to

CO1: Understand the concept of share capital, meaning, types, accounting treatment of issue and reissue of shares: buy back of equity shares and sweat equity shares
CO2: Understand and solve the concept of redemption of preference shares and bonus shares
CO3: Gain an understanding and ability to work with valuation of goodwill and its methods

CO4: Understand and solve the concepts of valuation of shares: meaning, objectives, determinants and main methods
CO5: Explain the concepts related with profit or loss before and after incorporation and final accounts of companies

Subject: Business Statistics-I (3.02)

At the end of the course, students will be able to

CO1: Learn about the history, origin, development, scope, uses and limitations of statistics
CO2: Present the data diagrammatically and graphically
CO3: Know about the concept of measure of central tendency and dispersion
CO4: Learn to calculate moments, skewness and kurtosis
CO5: Identify the different types of measurement of scale
CO6: Analyze the data with the help of correlation and predict the data with the help of regression

Subject: Business Regulatory Framework-I (3.03)

At the end of the course, students will be able to

CO1: Understand the concept of Indian Contract Act 1872, valid contract and its elements, proposal, acceptance and revocation, contractual capacity of parties, free consent of parties, lawful consideration, agreement declared as void and legal formalities
CO2: Explain in detail the concept of contingent contracts, performance of contracts, discharge, implied, quasi or constructive contracts, breach and indemnity and guarantee
CO3: Learn the contract of bailment and pledge and contracts of agency
CO4: Know about the Consumer Protection Act-1986

Subject: Corporate Law-I (3.04)

At the end of the course, students will be able to

CO1: Know about company, its features, types and merits of incorporation
CO2: Get themselves familiar with promotion of company
CO3: Attain knowledge of memorandum and articles of association of company
CO4: Familiarize with other main documents such as prospectus
CO5: Understand doctrine of indoor management
CO6: Adjudge the borrowing powers of the company

Subject: Human Resource Management (3.05)

At the end of the course, students will be able to

CO1: Learn the qualities of a good HR Manager and functions of HRM
CO2: Process of selection of Employees and techniques of training and development
CO3: Methods of wage payment and special incentives types
CO4: Learn how to maintain good industrial relations

Subject: Fundamentals of Insurance (option-I) (3.06)

At the end of the course, students will be able to

CO1: Know about the concept, history and meaning of insurance and principles of indemnity, subrogation and warranty
CO2: Learn about the concept of life insurance, main elements, importance, policies, annuities and premium determination under life insurance
CO3: Know about the General Insurance, Marine Insurance : main elements, types and agriculture insurance
CO4: Learn about the Fire Insurance, premium determination, types of policies, importance of Fire Insurance and Marine Insurance

Subject: Basics of Retailing (option-II) (3.06)

At the end of the course, students will be able to

CO1: Know about retailing and its usage in economy
CO2: Acquaint themselves about careers in retailing
CO3: Identify types of retailing and retailing wheel
CO4: Understand management of retailing operations
CO5: Learn functions of retail management and strategic retail management process
CO6: Enhance their knowledge about retail planning and its importance

Subject: Production Management (option-III) (3.06)

At the end of the course, students will be able to

CO1: Elaborate production process and production management
CO2: Define location and layout
CO3: Plan production with efficient planning techniques
CO4: Interpret quality control and plant maintenance
CO5: Understand the concept of startup small scale enterprises

Semester IV
Subject: Corporate Accounting-II (4.01)

At the end of the course, students will be able to

CO1: Understand and solve the concepts of internal and external reconstruction in the nature of merger and purchase
CO2: Interpret the need and fundamentals of liquidation of a company, to make liquidator's final statement of account accurately
CO3: Gain an understanding and ability to work with final accounts of banking companies
CO4: Learn about the concepts related with NBFC, mutual funds, financial reporting for financial institutions and stock brokers
CO5: Explain the concepts of holding companies, demonstrate the ability to understand the concepts related with holding and subsidiary company in detail

Subject: Business Statistics-II (4.02)

At the end of the course, students will be able to

CO1: Learn about the concept of index numbers, types, uses, price index and quantity index number and how to calculate price index numbers and quantity index numbers
CO2: Know about chain base index, base shifting, splicing and deflating, problems in construction of index numbers
CO3: Know about the concept of time series, causes of variations and components of time series and how to compute seasonal indices by simple averages, ratio to trend, ratio to moving averages and link relative methods
CO4: Know about the concept of probability, approaches to probability, conditional probability and Baye's theorem
CO5: Calculate probability using addition and multiplication laws of probability
CO6: Know the concept of probability distribution binomial, poisson and normal distribution and also learn the properties and parameters of these distributions

Subject: Business Regulatory Framework-II (4.03)

At the end of the course, students will be able to

CO1: Know about the Indian Partnership Act, 1932
CO2: Learn the Negotiable Instruments Act, 1981
CO3: Know and read the Sales of Goods Act 1930, Contract of Sale, Conditions and Warrantees, transfer of Property or Ownership, Performance of the contract - delivery and payment, unpaid seller and suits for Breach of Contract
CO4: Learn and explain the Right To Information Act, 2005

Subject: Corporate Law-II (4.04)

At the end of the course, students will be able to

CO1: Know about DMAT/paperless trending in stock market
CO2: Have knowledge of structure of share capital of company
CO3: Learn about rights and responsibilities of members/shareholders of company
CO4: Acquaint themselves with meetings of Shareholders and Board of Directors
CO5: Familiarize with powers and duties of directors
CO6: Get information about winding up process of company

Subject: Marketing Management (4.05)

At the end of the course, students will be able to

CO1: Know the basis of segmenting the market
CO2: Analyze the factors that affect the behaviour of buyers
CO3: Learn strategies to define the price of a product
CO4: Have knowledge about the Media of advertising and techniques of sales promotion

Subject: Business Ethics (option-I) (4.06)

At the end of the course, students will be able to

CO1: Define liberty, equality, justice, rights and recognition
CO2: Inculcate domain of politics, ethics market, globalization and different types of reasoning
CO3: Acquaint themselves with corporate code of ethics and corporate social responsibility towards business
CO4: Understand the basics of corruption, corporate scandals and other malpractices in business

Subject: Banking and Banking Law (option-II) (4.06)

At the end of the course, students will be able to

CO1: Know about the banks, commercial banks, functions and problems of NPA, structure and credit creation of banks
CO2: Learn about the RRB and cooperative banking in India along with RBI, its functions and Monetary Policy
CO3: Explain in detail determination and regulation of interest rates in India
CO4: Demonstrate the ability to understand the concepts related with negotiable instruments, features of negotiable instruments, capacity of parties and liability of maker of notes and acceptor of bills and endorsements

Subject: Secretarial Practices (option-III) (4.06)

At the end of the course, students will be able to

CO1: Know about the Introduction of company secretary and be familiar with the formation of company and company secretary
CO2: Learn about issue and allotment of shares
CO3: Have knowledge about share certificate and share warrant
CO4: Know about the calls on shares, forfeiture of shares
CO5: Familiarize themselves about transfer and transmission of shares
CO6: Know about the company meetings, requisites of a valid meeting, meeting of shareholders
CO7: Acquaint themselves with the motions and resolutions, voting and proxy

Semester V
Subject: Taxation Law-I (5.01)

At the end of the course, students will be able to

CO1: Identify various hands of incomes
CO2: Distinguish between incomes and receipts and gain knowledge of other technical vocabulary inclusive of residential status
CO3: Find out exempted incomes under income tax law
CO4: Learn in depth knowledge of deductions available under income tax act 1961
CO5: Understand how to make adjustments regarding carry forward of losses
CO6: Know about deemed incomes and clubbing of incomes

Subject: Cost Accounting-I (5.02)

At the end of the course, students will be able to

CO1: Understand the fundamentals of cost, its types Cost accounting: meaning, features, scope, techniques, methods, importance and limitations including differences and similarities of cost accounting system with financial accounting
CO2: Understand and solve the concepts of material, material control and methods of valuing material issues along with the concept of wastage of material and its types
CO3: Explain in detail the labour cost control meaning, methods and treatment of problems related with labour cost
CO4: Demonstrate the ability to understand the various systems of wage payments
CO5: Describe in detail concept of overheads collection, classification, allocation, apportionment and absorption of O/H's
CO6: Explain in detail the unit and output costing: meaning and objectives, cost sheet meaning, performa, types, preparation of cost sheet, determination of tender price, production account and its types

CO7: Describe numerically the reconciliation of cost and financial accounts: meaning, objectives and procedure

Subject: Accounting for Management (5.03)

At the end of the course, students will be able to

CO1: Learn Management Accounting and its use for the management in a business corporation
CO2: Discuss tools adopted in management accounting such as : analysis and interpretation of financial statements, ratio analysis and cash flow analysis
CO3: Understand cash budgeting, its meaning and use in appraisal to projects in a business

Subject: Financial Market Operations (5.04)

At the end of the course, students will be able to

CO1: Know the concept of money market, Indian money markets composition and structure, acceptance houses, discount houses, call money market, recent trends in Indian money market
CO2: Know the concept of capital market, security market, new issue market, secondary market
CO3: Know the concept of National stock exchange, and over the counter exchanges
CO4: Know about SEBI-Role and its powers, objectives, scope and functions
CO5: Know about the concept of investor protection and grievances concerning stock exchanges and dealing and their removal
CO6: Know about the brokers, sub brokers, market makers, jobbers, portfolio consultants, institutional investors, depository and merchant banking
CO7: Know about the role, policy measures relating to development financial institutions in India, products and services offered by IFCI, IDBI, EXIM, NABARD and ICICI

Subject: Entrepreneurship and Small Scale Industries (5.05)

At the end of the course, students will be able to

CO1: Define entrepreneurship and small business entrepreneurial competences and motivation
CO2: Correlate the role of innovation and business research with enterprises alongwith new business ideas
CO3: Describe managerial roles in designing and redesigning business processes and layout
CO4: Understand the issues of marketing, advertising and publicity with monetary and fiscal policies
CO5: Emphasize the desirability as well as feasibility of career in entrepreneurship

Subject: International Trade (option-I) (5.06)

At the end of the course, students will be able to

CO1: Know about international trade
CO2: Understand the modes of entering into international business
CO3: Get knowledge of various theories of trade
CO4: Assess international markets and promotion policies
CO5: Design products for foreign markets including branding policies
CO6: Differentiate between internationalization and globalization

Subject: Investment Management-V (option-II) (5.06)

At the end of the course, students will be able to

CO1: Describe the meaning, process and nature of investment, the concept and measurement of investment risk and return along with identification of investment opportunities, speculation, gambling and investment activities
CO2: Explain in detail the efficient market theory or hypothesis, technical analysis: Dow theory, charting techniques and volume indicators
CO3: Discuss about fundamental analysis, company analysis, industry analysis and economy analysis, technical Vs fundamental analysis
CO4: Make proper understanding of secondary market and online trading, BSE, derivatives concept, meaning, types, uses and explain the option contracts meaning, uses and types

Subject: International Business Environment (option-IV) (5.06)

At the end of the course, students will be able to

CO1: Define international business environment, its components, approaches and concept of globalization
CO2: Understand the modes of entry into international business, value of FDI
CO3: Know about the international theories of trade, role of WTO, IMF in international trade
CO4: Describe the different concepts of international distribution like designing of products, branding decision, international pricing, international logistic

Semester VI
Subject: Taxation Law-II (6.01)

At the end of the course, students will be able to

CO1: Assess the taxable income as per income tax law
CO2: Compute tax liability of individuals, H.U.F. and Partnership Firm

CO3: Calculate and identify deductions available for assesses
CO4: Know what incomes are exempted from income tax
CO5: Learn how to go for online filing of return
CO6: Know about penalties and fines in case of disobedience of law

Subject: Cost Accounting-II (6.02)

At the end of the course, students will be able to

CO1: Understand the fundamentals of process account: meaning, uses, treatment of normal, abnormal wastage, abnormal effectiveness, treatment of opening and closing stock (excluding WIP)
CO2: Understand the concept of joint product and by-product and main methods of apportionment of joint cost, inter profit, profits
CO3: Describe in detail the concept, meaning, features and preparation of contract account, escalation clause, contract near completion, cost plus contract, job and batch costing
CO4: Explain in detail the meaning of budget, budgeting and budgetary control, limitations, forecasts and budgets, installation of budgeting control system, classification of budgets, fixed and flexible budgets, performance and responsibility accounting
CO5: Demonstrate the ability to understand the meaning, limitations, std costs and budgeted costs, cost variance, direct material and direct labour only
CO6: Explain the concept of marginal costing, absorption costing, CVP analysis, BEPT analysis, key factor, BE chart, angle of incidence, concept of decision making and steps involved, determination of sales mix, make or buy decisions

Subject: Financial Management (6.03)

At the end of the course, students will be able to

CO1: Understand the nature of financial management, its goal and objectives. Function of financial management and ways of financial planning
CO2: Learn meaning, nature and planning of the most important aspect of financial management i.e. working capital management. It also includes management of cash, marketable securities and receivables management
CO3: Discuss significance and determination of cost of capital
CO4: Know about capital structure and dividend theories and policies

Subject: Auditing (6.04)

At the end of the course, students will able to

CO1: Learn about the concept of auditing, meaning, objectives, importance and types of auditing
CO2: Know the process of audit and know the concept of internal control, internal check and internal audit and audit programmer

CO3: Know about the audit procedure, routine checking, vouching
CO4: Know about verification and valuation of assets and liabilities
CO5: Know about the audit of public company and also learn qualification, appointment of company auditors, their powers, duties and liabilities
CO6: Know the concept of audit of depreciation and reserves, divisible profits and dividends
CO7: Know the concept of audit report and investigation and learn how to prepare audit report

Subject: GST (Goods and Service Tax) (6.05)

At the end of the course, students will be able to

CO1: Get basic knowledge of GST
CO2: Determine supply composite and mixed supply
CO3: Analyze composition levy and composition scheme under GST
CO4: Determine input tax credit and reversal of credit in case of banking and financial institutions
CO5: Understand and become aware of practical problems of GST for their own interest

Subject: International Marketing (option-I) (6.06)

At the end of the course, students will be able to

CO1: Define the nature and concepts of international marketing
CO2: Understand the international product trade cycle and informations, international price quotation and payment terms
CO3: Know the channel structure and selection decisions, appointment of foreign sale agents and export procedure and documentation
CO4: Evaluate the methods of product promotion, challenges in international advertising, media strategy, web marketing organizing trade fairs and exhibitions

Subject: Essentials of E-Commerce-II (option-III) (6.06)

At the end of the course, students will be able to

CO1: Explain in detail the concept of E-Commerce, types, business models in emerging E-Commerce areas, applications in E-Commerce and future of E-Commerce
CO2: Demonstrate the ability to understand the internet key technology concepts, switching techniques, TCP/IP, IP address, domain names, URL, Client/Server computing, internet protocol WWW, internet and web features, internet and extranet, VPN, firewall, web browser and elements of networking
CO3: Understand the elements or concepts of E-commerce such as E-visibility, E-shop, online payments, E-security, E-business and the concept of virtual auctions, online

share dealing, e-diversity, benefits of auctions, types and examples of online auctions

CO4: Recognize the need of an electronic CRM, its goal, applications and its role in Indian banking, technology use in CRM, E-Commerce marketing communications, online advertising, display ads, search engine advertising, sponsorships, E-mail marketing, online catalogs, social networking, offline advertising, retail sector and advantages and disadvantages of online retail

Subject: Tax Planning and Management (option-IV) (6.06)

At the end of the course, students will be able to

CO1: Have knowledge of tax planning, tax evasion, tax management and tax avoidance
CO2: Know about tax planning for employees
CO3: Tax planning for businessmen
CO4: Tax planning in relation to capital gains and other sources of income
CO5: Tax planning for partnership firm, body of individuals
CO6: Get knowledge regarding tax planning in relation to setting up of new business

Programme Name - B.Com.(Vocational)

PROGRAMME OUTCOMES OF B.Com.(Vocational)

This programme would provide well trained

PO1: Manpower for industries and professionally competent youth on technological front

PO2: The graduates will get first hand 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 graduate to pursue careers in either of the two fast-growing areas, viz. IT Industry, Commerce and Financial sector

PROGRAMME SPECIFIC OUTCOMES OF B.Com.(Vocational)

PSO 1: The programme enables the students to have 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

PSO 2: Develop the skill of applying concepts and techniques used in Commerce

PSO 3: 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: This course will develop human values and professional ethics in the social, moral, spiritual and legal aspects of commerce

PSO5: Demonstrate that they can present the results of their observations and research in a way that is objective, technically accurate and legally acceptable

PSO6: Students will be able to design, implement domain knowledge for computer programming

PSO7: This programme will enrich students with communication skills, ethical values, team work, professional and leadership skills

PSO8: Use effective technology for audio-visual presentations appropriately, viz. powerpoint, slides, posters, handouts and transparencies in oral presentations

Semester I
Subject: Financial Accounting-I (1.01)

At the end of the course, students will be able to

CO1: Learn about the meaning, objective, process, limitations, basic terms of accounting, generally accepted accounting principles
CO2: Maintain journal, ledger and prepare trail balance
CO3: Differentiate between capital and revenue items, reserves and provisions
CO4: Learn about the concept of depreciations, causes, accounting procedure under different methods
CO5: Recognize the different types of errors and rectifying them
CO6: Prepare final accounts with adjustments
CO7: Know about the meaning, features and accounting treatment of non-profit organizations
CO8: Know about the meaning of consignment and how to maintain consignment accounts

Subject: Business Mathematics-I (1.02)

At the end of the course, students will be able to

CO1: Understand indices and logarithms
CO2: Describe union, intersection, complement and difference of sets
CO3: Apply set theory to practical problems
CO4: Be familiar with presentation and combinations
CO5: Study about sequence and series
CO6: Learn about data interpretation
CO7: Analyze the practical problems with bare graphs, pie charts, line graphs, mix graphs

Subject: Business Economics-I (1.03)

At the end of the course, students will be able to

CO1: Define basic concepts of economy, price mechanism elasticity of demand and supply
CO2: Describe the theories of production, function in start and long run, ridge lines, theory of cost
CO3: Understand consumer behaviour, utility and indifference curve analysis
CO4: Understand markets - classification and structure

Subject: Business Management-I (1.04)

At the end of the course, students will be able to

CO1: Describe the concept, nature and objectives of Business including business systems
CO2: Discuss about management concept, nature and significance

CO3: Explain in detail the management thoughts or systems
CO4: Learn about the planning and decision making concepts and process including MBO
CO5: Evaluate the steps of corporate planning and strategy formulation
CO6: Demonstrate the ability to understand the concepts related to organizing such as authority and responsibility, centralization and decentralization including departmentalization and organizational structure

Subject: Computer Fundamental (1.05)

At the end of the course, students will be able to

CO1: Understand, identify and analyze computer hardware, software and network components
CO2: Recognize systems development, word-processing, spreadsheet and presentation software to solve basic information systems problems
CO3: Familiar with software's and hardware's of computer system and the way to install them in the system
CO4: Identify the categories of computers and basic hardware components

Subject: Operating Systems and Business Data Processing-I (1.06)

At the end of the course, students will be able to

CO1: Familiar with functions of operating systems and working of operating system
CO2: Knowledge of various process management concepts including scheduling
CO3: Recognize Disk Operating System structures
CO4: Understand concepts of memory management including virtual memory and paging

Semester II
Subject: Financial Accounting-II (2.01)

At the end of the course, students will be able to

CO1: Learn about the meaning of hire purchase system installment payment system and accounting procedure of HPS and IPS
CO2: Know about the meaning of branch and departmental A/c and to maintain the accounts of branches and departments
CO3: Know about the concept of dissolution of partnership, Garner V/s Murrey Rule, Gradual realization and piecemeal distribution
CO4: Know the concept of amalgamation and sale of partnership firm
CO5: Learn how to maintain accounts in case of dissolution of partnership and sale of partnership firm
CO6: Know the concept of joint venture account and royalty and learn how to maintain accounts in case of joint venture and royalty

Subject: Business Mathematics-II (2.02)

At the end of the course, students will be able to

CO1: Learn about matrices and determinants
CO2: Solve system of linear equations having unique solution and involving not more than three variables
CO3: Understand application of differentiation
CO4: Find compound interest and present value and amount of an amenity
CO5: Be familiar with ratio and proportion
CO6: Understand the concept of profit and loss and their practical application

Subject: Business Economics-II (2.03)

At the end of the course, students will be able to

CO1: Understand about market structures i.e. perfect competitive monopoly, monopolistic competition, oligopoly and price determination in different markets
CO2: Understand the concept of market structure and market failure
CO3: Understand market success and market failure
CO4: Understand theory of factor pricing and how different factors of production will get their reward
CO5: Know about the concept of rent, wages, interest and profits separately

Subject: Business Management-II (2.04)

At the end of the course, students will be able to

CO1: Describe the nature, concept and scope of staffing including concept of matching job and people and making students understand the concept of recruitment, selection and training of employees in detail
CO2: Explain in detail the motivation concept, theories and its types
CO3: Explain in detail the leadership concept, styles and theories
CO4: Discuss about the communication concept, nature, types and process, barriers and remedies
CO5: Explain in detail the controlling concept, process, techniques and effective control system
CO6: Understand the concepts, nature and process of planned change, resistance to change, emerging horizons to change faced by managers

Subject: Computer Fundamental (2.05)

At the end of the course, students will be able to

CO1: Familiarize with Master functions and basic charaterisitics of computer

CO2: Understand about secondary storage devices and update technology of IT
CO3: Recognize the primary storage devices and know about their uses in computer system
CO4: Understand the levels of information and mail merge and latest technologies of Computer

Subject: Operating Systems and Business Data Processing-II (2.06)

At the end of the course, students will be able to

CO1: Gain the knowledge of data processing system and file management of operating system
CO2: Be familiar with the architecture of database system, various keys
CO3: Understand the concept of database models and database of Relational Database System
CO4: Recognize the concept of database and reports in the MS-Access to store the data of real life applications

Semester III
Subject: Corporate Accounting-I (3.01)

At the end of the course, students will be able to

CO1: Understand the concept of share capital, meaning, types, accounting treatment of issue and reissue of shares: buy back of equity shares and sweat equity shares
CO2: Understand and solve the concept of redemption of preference shares and bonus shares
CO3: Gain an understanding and ability to work with valuation of goodwill and its methods
CO4: Understand and solve the concepts of valuation of shares: meaning, objectives, determinants and main methods
CO5: Explain the concepts related with profit or loss before and after incorporation and final accounts of companies

Subject: Business Statistics-I (3.02)

At the end of the course, students will be able to

CO1: Learn about the history, origin, development, scope, uses and limitations of statistics
CO2: Present the data diagrammatically and graphically
CO3: Know about the concept of measure of central tendency and dispersion
CO4: Learn to calculate moments, skewness and kurtosis
CO5: Identify the different types of measurement of scale
CO6: Analyze the data with the help of correlation and predict the data with the help of regression

Subject: Business Regulatory Framework-I (3.03)

At the end of the course, students will be able to

CO1: Understand the concept of Indian Contract Act 1872, valid contract and its elements, proposal, acceptance and revocation, contractual capacity of parties, free consent of parties, lawful consideration, agreement declared as void and legal formalities
CO2: Explain in detail the concept of contingent contracts, performance of contracts, discharge, implied, quasi or constructive contracts, breach and indemnity and guarantee
CO3: Learn the contract of bailment and pledge and contracts of agency
CO4: Know about the Consumer Protection Act-1986

Subject: Corporate Law-I (3.04)

At the end of the course, students will be able to

CO1: Know about company, its features, types and merits of incorporation
CO2: Get themselves familiar with promotion of company
CO3: Attain knowledge of memorandum and articles of association of company
CO4: Familiarize with other main documents such as prospectus
CO5: Understand doctrine of indoor management
CO6: Adjudge the borrowing powers of the company

Subject: Database Management System-I (3.05)

At the end of the course, students will be able to

CO1: Know about the basic concepts related to database system and various types of file organization techniques
CO2: Understand the database system architecture and various data models
CO3: Define and describe process related to database design like SDLC, DDL, SSAD and automated design tools
CO4: Understand and implement various normal forms of normalization and various dependencies used in various normal forms
CO5: Describe query processing and query optimization techniques and learn to implement various SQL queries

Subject: Structural Programming and Computer Graphics-I (3.06)

At the end of the course, students will be able to

CO1: Learn about program planning, requirements, algorithm and flow chart
CO2: Understand the concept of structural programming and describe operators, decision statement in C language

CO3: Define role of graphics in various fields like CAD, animators, DTP, Photoshop
CO4: Learn about types of graphics, hardware and software, primitives, applications, functions of graphics
CO5: Learn about the concept of arrays and strings in C language
CO6: Get practical learning on C programming

Semester IV
Subject: Corporate Accounting-II (4.01)

At the end of the course, students will be able to

CO1: Understand and solve the concepts of internal and external reconstruction in the nature of merger and purchase
CO2: Interpret the need and fundamentals of liquidation of a company, to make liquidator's final statement of account accurately
CO3: Gain an understanding and ability to work with final accounts of banking companies
CO4: Learn about the concepts related with NBFC, mutual funds, financial reporting for financial institutions and stock brokers
CO5: Explain the concepts of holding companies, demonstrate the ability to understand the concepts related with holding and subsidiary company in detail

Subject: Business Statistics-II (4.02)

At the end of the course, students will be able to

CO1: Learn about the concept of index numbers, types, uses, price index and quantity index number and how to calculate price index numbers and quantity index numbers
CO2: Know about chain base index, base shifting, splicing and deflating, problems in construction of index numbers
CO3: Know about the concept of time series, causes of variations and components of time series and how to compute seasonal indices by simple averages, ratio to trend, ratio to moving averages and link relative methods
CO4: Know about the concept of probability, approaches to probability, conditional probability and Baye's theorem
CO5: Calculate probability using addition and multiplication laws of probability
CO6: Know the concept of probability distribution binomial, poisson and normal distribution and also learn the properties and parameters of these distributions

Subject: Business Regulatory Framework-II (4.03)

At the end of the course, students will be able to

CO1: Know about the Indian Partnership Act, 1932
CO2: Learn the Negotiable Instruments Act, 1981

CO3: Know and read the Sales of Goods Act 1930, Contract of Sale, Conditions and Warrantees, transfer of Property or Ownership, Performance of the contract - delivery and payment, unpaid seller and suits for Breach of Contract
CO4: Learn and explain the Right To Information Act, 2005

Subject: Corporate Law-II (4.04)

At the end of the course, students will be able to

CO1: Know about DMAT/paperless trending in stock market
CO2: Have knowledge of structure of share capital of company
CO3: Learn about rights and responsibilities of members/shareholders of company
CO4: Acquaint themselves with meetings of Shareholders and Board of Directors
CO5: Familiarize with powers and duties of directors
CO6: Get information about winding up process of company

Subject: Database Management System-II (4.05)

At the end of the course, students will be able to

CO1: Learn various types of databases and their physical database organization
CO2: Understand the concept of decision support system, data warehousing and data mining
CO3: Know about various advance database models
CO4: Describe various database security concepts
CO5: Define, describe and implement various database operations in MS-Access and to make slides in MS-Powerpoint

Subject: Structured Programming and Computer Graphics-II (4.06)

At the end of the course, students will be able to

CO1: Know about the basic concepts of C language and implement selective structures and repetitive structures in programs using different control statements
CO2: Emphasize the importance of use of pointers for efficient 'C' programming
CO3: Use formatted and unformatted functions, and differentiate between various types of loops
CO4: Use structures and unions in a 'C' program for handling multivariable data
CO5: Describe the various applications of computer graphics and display methods

Semester V
Subject: Taxation Law-I (5.01)

At the end of the course, students will be able to

CO1: Identify various hands of incomes

CO2: Distinguish between incomes and receipts and gain knowledge of other technical vocabulary inclusive of residential status
CO3: Find out exempted incomes under income tax law
CO4: Learn in depth knowledge of deductions available under income tax act 1961
CO5: Understand how to make adjustments regarding carry forward of losses
CO6: Know about deemed incomes and clubbing of incomes

Subject: Cost Accounting-I (5.02)

At the end of the course, students will be able to

CO1: Understand the fundamentals of cost, its types Cost accounting: meaning, features, scope, techniques, methods, importance and limitations including differences and similarities of cost accounting system with financial accounting
CO2: Understand and solve the concepts of material, material control and methods of valuing material issues along with the concept of wastage of material and its types
CO3: Explain in detail the labour cost control meaning, methods and treatment of problems related with labour cost
CO4: Demonstrate the ability to understand the various systems of wage payments
CO5: Describe in detail concept of overheads collection, classification, allocation, apportionment and absorption of O/H's
CO6: Explain in detail the unit and output costing: meaning and objectives, cost sheet meaning, performa, types, preparation of cost sheet, determination of tender price, production account and its types
CO7: Describe numerically the reconciliation of cost and financial accounts: meaning, objectives and procedure

Subject: Accounting for Management (5.03)

At the end of the course, students will be able to

CO1: Learn Management Accounting and its use for the management in a business corporation
CO2: Discuss tools adopted in management accounting such as : analysis and interpretation of financial statements, ratio analysis and cash flow analysis
CO3: Understand cash budgeting, its meaning and use in appraisal to projects in a business

Subject: Financial Market Operations (5.04)

At the end of the course, students will be able to

CO1: Know the concept of money market, Indian money markets composition and structure, acceptance houses, discount houses, call money market, recent trends in Indian money market

CO2: Know the concept of capital market, security market, new issue market, secondary market
CO3: Know the concept of National stock exchange, and over the counter exchanges
CO4: Know about SEBI-Role and its powers, objectives, scope and functions
CO5: Know about the concept of investor protection and grievances concerning stock exchanges and dealing and their removal
CO6: Know about the brokers, sub brokers, market makers, jobbers, portfolio consultants, institutional investors, depository and merchant banking
CO7: Know about the role, policy measures relating to development financial institutions in India, products and services offered by IFCI, IDBI, EXIM, NABARD and ICICI

Subject: Computer Aided Drafting and Advanced Topics in Computer-I (5.05)

At the end of the course, students will be able to

CO1: Learn about CAD/CAM, product cycle and computer technology which includes memory, input/output, computer programming languages etc.
CO2: Learn about CAD fundamentals, design process, applications, hardware and software requirements, design work station, garphics terminal and input/output devices
CO3: Describe computer graphics, configuration of graphics system, functions of graphics package and role of multimedia
CO4: Describe data warehousing, multi-processor architecture, DBMS schemas, data extraction, clean up and metadata

Subject: Essentials of E-Commerce (5.06)

At the end of the course, students will be able to

CO1: Describe introduction of e-commerce, its types, advantages, disadvantages, mobile commerce and portals in detail with their types and uses
CO2: Describe about inter organization, transactions, e-market, online shopping etc. EDI, e-tailing, virtual supply technologies
CO3: Learn and describe about e-chop, EPS (Electronic Payment System) e-cash and all security schemes in detail
CO4: Learn and describe about e-banking in detail, e-commerce technical components, OSI model, TCP/IP model and supply chain management

Semester VI
Subject: Taxation Law-II (6.01)

At the end of the course, students will be able to

CO1: Assess the taxable income as per income tax law
CO2: Compute tax liability of individuals, H.U.F. and Partnership Firm
CO3: Calculate and identify deductions available for assesses

CO4: Know what incomes are exempted from income tax
CO5: Learn how to go for online filing of return
CO6: Know about penalties and fines in case of disobedience of law

Subject: Cost Accounting-II (6.02)

At the end of the course, students will be able to

CO1: Understand the fundamentals of process account: meaning, uses, treatment of normal, abnormal wastage, abnormal effectiveness, treatment of opening and closing stock (excluding WIP)
CO2: Understand the concept of joint product and by-product and main methods of apportionment of joint cost, inter profit, profits
CO3: Describe in detail the concept, meaning, features and preparation of contract account, escalation clause, contract near completion, cost plus contract, job and batch costing
CO4: Explain in detail the meaning of budget, budgeting and budgetary control, limitations, forecasts and budgets, installation of budgeting control system, classification of budgets, fixed and flexible budgets, performance and responsibility accounting
CO5: Demonstrate the ability to understand the meaning, limitations, std costs and budgeted costs, cost variance, direct material and direct labour only
CO6: Explain the concept of marginal costing, absorption costing, CVP analysis, BEPT analysis, key factor, BE chart, angle of incidence, concept of decision making and steps involved, determination of sales mix, make or buy decisions

Subject: Financial Management (6.03)

At the end of the course, students will be able to

CO1: Understand the nature of financial management, its goal and objectives. Function of financial management and ways of financial planning
CO2: Learn meaning, nature and planning of the most important aspect of financial management i.e. working capital management. It also includes management of cash, marketable securities and receivables management
CO3: Discuss significance and determination of cost of capital
CO4: Know about capital structure and dividend theories and policies

Subject: Auditing (6.04)

At the end of the course, students will able to

CO1: Learn about the concept of auditing, meaning, objectives, importance and types of auditing
CO2: Know the process of audit and know the concept of internal control, internal check and internal audit and audit programmer
CO3: Know about the audit procedure, routine checking, vouching

CO4: Know about verification and valuation of assets and liabilities
CO5: Know about the audit of public company and also learn qualification, appointment of company auditors, their powers, duties and liabilities
CO6: Know the concept of audit of depreciation and reserves, divisible profits and dividends
CO7: Know the concept of audit report and investigation and learn how to prepare audit report

Subject: Computer Aided Drafting and Advanced Topics in Computer-II (6.05)

At the end of the course, students will be able to

CO1: Learn about implementation, features and future of CAD and be familiar with AI, elements, knowledge based expert system, machine vision system and neural networks
CO2: Learn about hardware and software requirements of Auto CAD, data encryption, data communication and networking and learn about robotics
CO3: Describe multimedia, components and its application in details and learn about virtual reality technology and computer integrated manufacturing system
CO4: Describe computer graphics, applications and various input and output devices

Subject: Information Technology in Business (6.06)

At the end of the course, students will be able to

CO1: Describe information technology, emerging technology, learn about communication system, internet, www and email and differentiate between internet and intranet
CO2: Describe and analyze the use of e-commerce and emerging technologies in today's world
CO3: Able to define modern database management system and concept of multimedia
CO4: Learn and describe about the KDD, OLAP, ERP, SCM, CRM, GIS and AI and BI
CO5: Learn and describe about different information system and mobile computing and business on the internet

Programme Name - B.Com.(Hons.)

PROGRAMME OUTCOMES OF B.Com.(Hons.)

After completing B.Com.(Hons.), students will be able to

PO1: Gain a thorough knowledge in fundamentals of management, finance, statistics, taxation, economy and international business and ethics
PO2: Set up a computerized set of accounting books
PO3: Apply ethical principles for effective and efficient working in a business environment
PO4: Demonstrate progressive learning of various tax issues and forms related to individuals
PO5: Develop communication skills which will enable them to interact in a more constructive manner
PO6: Pursue research work in the fields of marketing, finance

PROGRAMME SPECIFIC OUTCOMES OF B.Com.(Hons.)

PSO 1: This programme would train students for latest economic challenges, trends of markets and provide the students professional training for working in Banking sector, Insurance companies, Financing companies etc.
PSO 2: Graduates in Commerce Honours will acquire skills and knowledge to become stock agents, managers, accountants etc.
PSO 3: This programme would train the students to gain knowledge of statistics and law
PSO 4: Graduates in Commerce Honours will get firsthand experience on how to acquire skills for marketing managers, sales managers and as administrators in any company
PSO 5: The knowledge of this course would facilitate the students to apply capital budgeting techniques for investment techniques

Semester I
Subject: Introduction to Statistics (BCH-1.01)

At the end of the course, students will be able to

CO1: Develop an understanding of collection, classification and presentation of data
CO2: Differentiate and learn different concepts of central tendency and variations
CO3: Assess the meaning of moments, skewness and kurtosis
CO4: Analyze the importance and application of index numbers
CO5: Comprehend the theory of probability distribution
CO6: Describe correlation and regressions analysis
CO7: Take logical statistical decision regarding expected opportunity loss and statistical quality control

CO8: Memorize the various components and models of time series analysis

Subject: Business Communication (BCH-1.02)

At the end of the course, students will be able to

CO1: Understand the meaning and importance of business communication
CO2: Identify the different parts of writing messages
CO3: Classify basic forms of communication pattern
CO4: Determine the appropriate communication channel
CO5: Design a project report on industrial visit
CO6: Create formal and informal reports
CO7: Compose e-mail and memos
CO8: Recognize common tools for effective presentation
CO9: Restate key principles of effective public speaking

Subject: Business Organization (BCH-1.03)

At the end of the course, students will be able to

CO1: Describe India's experience of globalization, liberalization and privatization
CO2: Identify entrepreneurial opportunities in contemporary business environment
CO3: Explain different forms of business ownership
CO4: Analyze various functional aspects of business such as marketing, finance and HR
CO5: Understand the meaning of MNCs, network marketing, franchising, BPO, E-Commerce and M-Commerce
CO6: Discuss the role of creativity and innovation

Subject: An Introduction to Accounting (BCH-1.04)

At the end of the course, students will be able to

CO1: Understand the concept of accounting and bases of accounting
CO2: Familiarize with GAAP and types of accounting standards
CO3: Recall the whole accounting process
CO4: Become aware of capital and revenue expenditure and receipts
CO5: Describe depreciation concepts and methods clearly
CO6: Explain preparation of financial statements of non-corporate business entities

Subject: Fundamentals of Economics (BCH-1.05)

At the end of the course, students will be able to

CO1: Demonstrate the knowledge of the laws of demand and supply
CO2: Explain and calculate elasticity of demand and supply

CO3: Understand the concept of consumer equilibrium with the help of ordinal approach
CO4: Describe the concept of consumer, behaviour
CO5: Analyze the laws of production
CO6: Discuss the application of theory of production
CO7: Understand the concept of producer's optimization

Subject: Business Law-I (BCH-1.06)

At the end of the course, students will be able to

CO1: Appreciate the relevance of business law to individual and business
CO2: Identify the fundamental legal principles behind contractual agreements
CO3: Examine how business can be held liable in tort for the action of their employees
CO4: Understand the relevance of the special contracts like indeminity, guarantee, bailment, pledge and agency
CO5: Explain the contract of sale and its implications

Semester II
Subject: Financial Accounting for Business (BCH-2.01)

At the end of the course, students will be able to

CO1: Analyze the concept of higher purchase system and Installment Payment system
CO2: Give Introduction to tally program
CO3: Learn the concept of Royalty accounts
CO4: Generalize dependent and independent branch system
CO5: Discuss Partnership accounts

Subject: Business Economics (BCH-2.02)

At the end of the course, students will be able to

CO1: Classify various types of costs
CO2: Comprehend different market situations
CO3: Compare various market structures
CO4: Discuss the concept of stable equilibrium
CO5: Explain the difference between developed and underdeveloped countries
CO6: Understand the concept of economic growth and development
CO7: Apply economic analysis to the management of the environment and natural resources

Subject: Business Statistics (BCH-2.03)

At the end of the course, students will be able to

CO1: Describe Correlation Analysis

CO2: Assess Regression Analysis
CO3: Develop an understanding of Binomial, poission and normal distribution
CO4: Take logical statistical decision regarding expected opportunity loss and statistical quality control
CO5: Memorize the various components and models of time series analysis

Subject: Business Management (BCH-2.04)

At the end of the course, students will be able to

CO1: Describe various management approaches and its applications
CO2: Understand the basic functions of management
CO3: Classify and correlate various type of growth strategies
CO4: Evaluate various techniques and theories of motivation
CO5: Explain the process and techniques of controlling
CO6: Identify the process of effective communication and its usage

Subject: Business Law-II (BCH-2.05)

At the end of the course, students will be able to

CO1: Understand applicability of Indian Partnership Act, 1932
CO2: Learn Industrial Dispute Act, 1947 like provision related to strike, lock out, lay off, retrenchment
CO3: Gain awareness regarding health, safety and welfare of workers working in factory
CO4: Understand Factories Act, 1947, its provisions regarding working hours of adults, employment of young persons
CO5: Learn Foreign Exchange Management Act and its features

Subject: Introduction to Computer (BCH-2.06)

At the end of the course, students will able to

CO1: Identify the components of computer and will be able to assemble the parts of computer. Students will be able to work in different OS environment and will be able to classify different types of programming language
CO2: Understand the network elements, its topology and types. Students will be able to work with LAN environment
CO3: Work with MS-Word software and also take knowledge of different commands like - mail merge, macro, format, spell check and table creation, etc/
CO4: Different internet concepts, benefits, hardware and software requirements, its applications.
CO5: Work with MS-Excel software and also take knowledge of different commands like - Pivot table, goal seek, charts, filter, sort and print the worksheet, etc.

CO6: Work with MS-Access software and also take knowledge of different objects like - table, reports, forms, etc.

Semester III
Subject: Business Mathematics (BCH-3.01)

At the end of the course, students will be able to

CO1: Know about the Algebra of matrices, determinants, ajoint and inverie of materices
CO2: Learn about elementary operations on matrices, system of linear equations, leontief input-output model
CO3: Compute compound interest, annuities, time value of money
CO4: Understand differentiation and integration
CO5: Describe linear programming: Graphic method and simplex method
CO6: Use set theory in practical problems

Subject: Corporate Accounting-I (BCH-3.02)

At the end of the course, students will be able to

CO1: Recall the meaning of shares and debentures
CO2: Introduce the students meaning of issue of shares and debentures and their proceedings
CO3: Analyze different methods of valuation of goodwill and valuation of shares
CO4: Become aware of the concept of final accounts and P & L prior incorporation
CO5: Discuss and make students aware about holding companies
CO6: Analyze the difference between holding and subsidiary company

Subject: Cost Accounting (BCH-3.03)

At the end of the course, students will be able to

CO1: Illustrate the concept of cost accounting and inventory control techniques
CO2: Practice the concept of labour cost and overhead cost accounting
CO3: Differentiate cost and financial accounting
CO4: Summarize the concept of contract costing and process costing
CO5: Understand the concept of unit costing
CO6: Describe the concept of reconciliation of cost and financial accounting

Subject: Company Law-I (BCH-3.04)

At the end of the course, students will able to

CO1: Understand the concept of companies and types of companies
CO2: Describe the functions and importance of promotes

CO3: Discuss the contents of prospectus
CO4: Analyze the doctrine of ultra virus and doctrine of indoor management
CO5: Distinguish between memorandum of association and articles of association
CO6: Identify the debentures and their types

Subject: Principles of Marketing (BCH-3.05)

At the end of the course, students will able to

CO1: Understand the concept and scope of marketing
CO2: Describe the significance of consumer behaviour
CO3: Analyze the basis for market segmentations
CO4: Differentiate between branding and trademark
CO5: Explain the types and factors affecting choice of a distribution channel
CO6: Generalize the importance and salient features of an effective advertising

Subject: Basic of Information Technology (BCH-3.06)

At the end of the course, students will be able to

CO1: Gain knowledge about data information, data processing and application of EDP (Electronic Data Processing)
CO2: Know the concept of memory, memory types, knowledge of software and their role, different types of operating system and their functions
CO3: Learn about data communication system, data transmissions, know the concept of transmission modes and media
CO4: Know the concept of E-commerce and their usage, e-commerce types, advantages and disadvantages and its application, and learn the concept EDI, Bluetooth, Infrared communication and smart card
CO5: Learn about computer network, its type and topologies, internet concept, history and benefits and be a familiar with multimedia concept, components and application
CO6: Know the practical concept of MS-Powerpoint and tally software, learn use of slide creation, animation with sounds, practical approach of creating vouchers

Semester IV
Subject: Corporate Accounting-II (BCH-4.01)

At the end of the course, students will be able to

CO1: Analyze the concept of amalgamation and internal reconstruction of companies
CO2: Familiarize themselves with the fundamentals of Banking companies accounts and underwriting of shares and debentures
CO3: Discuss and understand the concept of liquidation
CO4: Become aware of accounts of electricity company and double accounts system

Subject: Business Ethics (BCH-4.02)

At the end of the course, students will be able to

CO1: Define the terms politics, liberty, equality, justice, rights and recognition
CO2: Analyze the approaches to moral reasoning : consequentalism
CO3: Apply the politics and ethics in Business : environment, accountability, responsibility, leadership, diversity
CO4: Discuss about corporate social responsibility
CO5: Recognize about gender sensitization
CO6: Explain the term corruption, corporate scandals, whistle blowing

Subject: Company Law-II (BCH-4.03)

At the end of the course, students will be able to

CO1: Explain depository system and paperless trading
CO2: Differentiate between shareholders and members
CO3: Memorize the essentials and kinds of meetings
CO4: Classify the different modes of winding up
CO5: Discuss the duties, powers and liabilities of director
CO6: Analyze the consequences of winding up

Subject: Auditing (BCH-4.06)

At the end of the course, students will be able to

CO1: Describe the term audit, its objectives, internal control, internal check and internal audit
CO2: Explain classification of audit
CO3: Explain routine checking, vouching and verification of assets and liabilities
CO4: Evaluate audit of limited companies
CO5: Develop audit report
CO6: Analyze the meaning, nature and objectives of investigation, cost audit, management audit and tax audit

Subject: Statistical Analysis with MS-Excel (BCH-4.04)

At the end of the course, students will be able to

CO1: Classify data collection methods. Differentiate experiment and survey
CO2: Explain data and parathion process, missing values and otliers
CO3: Illustrate descriptive statistics
CO4: Discuss hypothesis tests
CO5: Summarize chi-square test

CO6: Define ANOVA, explain SPSS (Statistical Package for Social Sciences)

Subject: Financial Institutions and Markets (BCH-4.05)

At the end of the course, students will be able to

CO1: Understand the concept of financial institutions
CO2: Describe the context of banking and financial system
CO3: Elucidiate the board functions and categories of financial institutions
CO4: Compare and contrast different types of money market instruments
CO5: Discuss the role of merchant banker in financial system
CO6: Differentiate between money market and capital market
CO7: Get familiar the concept of venture capital
CO8: Appraise the problems and prospects of leasing industry in India

Semester V
Subject: Financial Management (BCH-5.01)

At the end of the course, students will be able to

CO1: Explain the concept of financial planning
CO2: Analyze leverage and cost of capital
CO3: Assess various capital structure theories and its determinants
CO4: Generalize the concept of working capital and its determinants
CO5: Summarize working capital management, cash management and receivable management
CO6: Become Familiar with the concept of dividend decision and its various models

Subject: Investment Analysis (BCH-5.02)

At the end of the course, students will be able to

CO1: Describe meaning, nature and process of investment
CO2: Classify between different investment avenues
CO3: Measure risk and return of investment
CO4: Distinguish between fundamental analysis and technical analysis
CO5: Generalize various charting techniques and DOW theory
CO6: Deduce various forms of EMM and its empirical evidence
CO7: Evaluate trading mechanism in Bombay stock exchange
CO8: Discuss derivatives in Indian Capital Market

Subject: Money and Banking (BCH-5.03)

At the end of the course, students will be able to

CO1: Understand the concept of money
CO2: Analyze the importance of money in various economic systems
CO3: Discuss the circular flow of money
CO4: Explain the causes and effects of inflation
CO5: Describe the functions of commercial and central banks
CO6: Know the concepts of banking
CO7: Apply key models and concepts of monetary economics and banking theory to current events

Subject: Contemporary Issues in Commerce (BCH-5.04)

At the end of the course, students will be able to

CO1: Provide an insight into contemporary and emerging issues in the field of finance, marketing and human resource
CO2: Explain the recent trends in banking and financial services
CO3: Discuss the current status of India's BOP and trends in overall balance of payment
CO4: Evaluate the role of tax regulations in economic growth
CO5: Become familiar with the basic concepts and activities of microfinance in India
CO6: Analyze the impact of modern retailing challenges in India
CO7: Develop implement and evaluate rural marketing strategies
CO8: Solve various problems with respect to workforce diversity

Subject: Income Tax (BCH-5.05)

At the end of the course, students will be able to

CO1: Understand the concept of income and income tax
CO2: Classify assesses on the basis of their residence
CO3: Explain exempted income of tax
CO4: Understand how to compute income from salary, house property, profit and gains of business and profession, capital gains and other sources
CO5: Consider whether and how to set off and carry forward losses after claiming various deduction from total income

Subject: Entrepreneurship and Small Scale Business (BCH-5.06)

At the end of the course, students will be able to

CO1: Understand the meaning of entrepreneurship and its role
CO2: Discuss about entrepreneurial competencies, motivation, performance and rewards

CO3: Associate opportunity scouting and idea, role of creativity and innovations and business research
CO4: Understand designing and redesigning business processes, location, layout, operations planning and control
CO5: Develop the idea of consortium marketing, competitive bidding/tender marketing, negotiation with principal customer
CO6: Familiarize themselves with the concept of product life cycle, advertising and publicity, sales and distribution management

Semester VI
Subject: Accounting for Managers (BCH-6.01)

At the end of the course, students will able to

CO1: Understand the techniques and limitations of management accounting
CO2: Generalize the tools and approaches of financial statement analysis
CO3: Analyze the objectives and accounting procedure of cash flow statement
CO4: Discuss the accounting for price level changes
CO5: Calculate the BEP, P/V, ratio, margin of safety
CO6: Evaluate the various variance analysis including material, labour and overhead variance

Subject: Income Tax Law and Administration (BCH-6.03)

At the end of the course, students will be able to

CO1: Analyze the total income and total tax liability of the assesses after computing rebate and relief of tax
CO2: Assess tax of HUF, firms and AOP
CO3: Fill and file return of income
CO4: Describe tax authorities along with various procedures for assessment
CO5: Discuss recovery, refund of tax and appeals, penalties, offences and prosecution provisions

Subject: Retail Management and Sales Procedures (BCH-6.06)

At the end of the course, students will be able to

CO1: Explain the present and future of retailing in India
CO2: Distinguish different types of retailers
CO3: Associate retailing models
CO4: Define wheel of retailing
CO5: Memorize strategic retail management process
CO6: Classify pricing and location strategy

Subject: Project Planning and Management (BCH-6.02)

At the end of the course, students will be able to

CO1: Understand the term project planning, strategy and capital allocation and generation of project ideas
CO2: Analyze market and demand analysis, time value of money
CO3: Generalize the valuation of real options and various sources of projects, venture capital and private equity
CO4: Summarize various project network techniques and project administrative aspects
CO5: Assess special decision situation

Subject: Business Environment and International Business (BCH-6.05)

At the end of the course, students will be able to

CO1: Describe the components of business environment
CO2: Analyze the nature of Indian economy
CO3: Apply economic theories and concepts to contemporary social issues
CO4: Demonstrate the ability to employ the economic way of thinking
CO5: Identify global, historical and institutional forces
CO6: Discuss international business environment
CO7: Understand the theories of international trade
CO8: Classify the various mode of entry in international business
CO9: Become aware of the various international institutions

Subject: Human Resource Management (BCH-6.04)

At the end of the course, students will be able to

CO1: Define the concept of HRM
CO2: Examine the future role of Human Resource Management
CO3: Explain the various steps involved in selection of personnel
CO4: Design a sound employee training programme
CO5: Evaluate the effectiveness of training programme
CO6: Appraise the HR challenges in recruitment
CO7: Discuss the machinery for prevention of disputes
CO8: Assess various methods of wage payments
CO9: Familiarize with the basic concept of HRD

Programme Name -B.Sc.(Medical)

Programme Outcomes of B.Sc.(Medical)

PO1: This course helps the students to develop scientific temper and proves be more beneficial for society as the scientific developments can make a society to grow at a rapid pace
PO2: After the completion of this course students have the option to go for higher studies and go for research work for the welfare of mankind
PO3: Students can also join as scientists and go for professional job oriented courses
PO4: After the completion of the course students have option to join Indian Civil Services as IAS, IFS, etc.
PO5: Science graduates can go to serve in industries or may opt for establishing their own industrial units

Programme Specific Outcomes of B.Sc.(Medical)

B.Sc.(Medical) graduates is able to:

PSO1: Acquire knowledge about Botany, Zoology, Chemistry, Biotechnology, etc.
PSO2: Explain major concepts in biological sciences
PSO3: Communicate biological knowledge in oral and written form
PSO4: Recognize the relationship between structure and function at molecular, cellular and organizational level
PSO5: Use biological instrumentation and proper laboratories techniques

B.Sc.(Botany)

Semester I
Subject: Diversity of Microbes (BOT 1.1)

At the end of the course, students will be able to

CO1: Distinguish microbes and different groups of algae and fungi
CO2: Learn about the economic importance and life cycle patterns of these groups
CO3: Gain knowledge about the diseases caused by some of these and their control measures
CO4: Understand useful and harmful activities of bacteria and viruses
CO5: Learn about the features of lichens

Subject: Cell Biology (BOT 1.2)

At the end of the course, students will be able to

CO1: Explain the structure of cell components and their functions
CO2: Describe cell cycle and cell division in plants
CO3: Understand the structure of chromosomes
CO4: Know about the chromosomal aberrations
CO5: Study about sex chromosomes and sex determination

Subject: Practical (Botany)

At the end of the course, students will be able to

CO1: Learn about the microscopic observation and identification of algae, fungi and lichens
CO2: Observe and identify the crop plants infected by pathogens included in the syllabus
CO3: Study casual organisms, symptoms and preventive measures of various diseases
CO4: Train students to prepare micro preparation/smear mount of onion root tips and identification of different stages of mitosis

Semester II
Subject: Diversity of Archegoniate (BOT 2.1)

At the end of the course, students will be able to

CO1: Distinguish between different groups of bryophytes and pteridophytes
CO2: Learn about the economic importance of life cycle patterns of these groups
CO3: Describe the evolution of sporophyte in bryophytes
CO4: Understand heterospory and origin of seed habit in pteridophytes
CO5: Gain idea about the evolution of stelar system, apogomy, apospory

Subject: Genetics (BOT 2.2)

At the end of the course, students will be able to

CO1: Have knowledge of the nature and function of genes
CO2: Understand the process of inheritance
CO3: Describe linkage, crossing over and mutations
CO4: Understand the process of cytoplasmic inheritance
CO5: Gain knowledge about structure and replication of DNA, DNA protein interaction genetic code, transfer of genetic information and regulation of gene impression

Subject: Practical (Botany)

At the end of the course, students will be able to

CO1: Learn about the microscopic observation of bryophytes and pteudophytes along with their identification
CO2: Know the concept of Mendelian inheritance through various experiments

Semester III
Subject: Biology and Diversity of Seed Plants - I (BOT 3.1)

At the end of the course, students will be able to

CO1: Gain the knowledge of general features and diversity of Gymnosperms
CO2: Know about the evolution of seed habit
CO3: Know about the fossils and fossilization processes (Paleo botany)
CO4: Know the morphology, anatomy and life cycle pattern of gymnospermic plants
CO5: Compare the characteristics features of Gymnosperms with Angiosperms

Subject: Plant Anatomy (BOT 3.2)

At the end of the course, students will be able to

CO1: Know and compare about the different plant-tissue systems
CO2: Know about the normal secondary and anomalous secondary growth
CO3: Compare the dicot and monocot leaf structure
CO4: Compare the apical root and apical shoot meristem
CO5: Know about the structural modifications in roots

Subject: Biology and diversity of Seed Plants - I and Plant Anatomy (Practical)

At the end of the course, students will be able to

CO1: Prepare microscopic slides of Gymnospermic and Angiospermic plant materials
CO2: Study and compare the Gymnosperms and Angiosperms in the laboratory and field
CO3: Study about the morphological and Anatomical features of Gymnosperms and Angiosperms

Semester IV
Subject: Biology and Diversity Seed Plant - II (BOT 4.1)

At the end of the course, students will be able to

CO1: Know the fundamental components of taxonomy
CO2: Gain knowledge about modern trends in plant taxonomy

CO3: Be able to compare the different classification systems of Angiosperms
CO4: Be able to compare different floral features and economic importance of various taxonomic groups

Subject: Plant Embryology (BOT 4.2)

At the end of the course, students will be able to

CO1: Gain the knowledge of concept of dicot and monocot seed structure and development
CO2: Know the process of development of microspores and megaspores
CO3: Gain the knowledge of polliration and fertilization in flowering plants
CO4: Know the embryo and endosperm formation in seed plants
CO5: Gain the complete knowledge of embryology, starting from structure of seed to development of new plant

Subject: Biology and Diversity of Seed Plants-II (Practical)

At the end of the course, students will be able to

CO1: Compare and study the floral features of various taxonomic families
CO2: Learn how to dissect out the flowers to study various floral parts
CO3: Dissect out the embryo, and study the structure of seeds
CO4: Study field of Angiospermic plants

Semester V
Subject: Plant Physiology (BOT 5.1)

At the end of the course, students will be able to

CO1: Have the complete knowledge of Plant-Water relations in plants
CO2: Gain the physiological phenomenon of mineral nutrition and transport of organic substances
CO3: Learn about the complete process of photosynthesis and photo respiration
CO4: Gain the knowledge of growth and developmental processes in plants
CO5: Know about the phyto hormones and their physiological effects on plant growth

Subject: Ecology (BOT 5.2)

At the end of the course, students will be able to

CO1: Gain the knowledge of scope and importance of ecology
CO2: Know about the various climatic factors and their effect on vegetation
CO3: Gain the knowledge about various plant adaptations
CO4: Know about the population and community ecology along with their characteristics
CO5: Analyze different types of pollutants in air and water

CO6: Know about the global-change, by studying green house effect, global-warming and carbon trading

Subject: Plant Physiology and Ecology (Practical)

At the end of the course, students will be able to

CO1: Set up and demonstrate physiological experiments and know the physiological phenomenon in detail
CO2: Develop the practical skills to demonstrate Osmosis, Photosynthesis etc.
CO3: Analyze the soil and water samples
CO4: Conduct the field surveys, to study the vegetation of the community

Semester VI
Subject: Biochemistry and Plant Biotechnology (BOT 6.1)

At the end of the course, students will be able to

CO1: Understand basics of enzymes and enzyme-regulation in plants
CO2: Learn about the process of aerobic and anaerobic respiration
CO3: Gain knowledge about structure and functions of lipids and their metabolism
CO4: Learn about the process of biological nitrogen fixation
CO5: Know about the basics of plant tissue culture and biotechnology along with their applications

Subject: Economic Botany (BOT 6.2)

At the end of the course, students will be able to

CO1: Know about the centres of origin of crop plants
CO2: Gain the knowledge of origin, distribution and cultivation of cereals, pulses and vegetables
CO3: Know about the botanical description, cultivation and uses of various categories of plants like - fibers, oils, spices and medicinal plants
CO4: Gain the knowledge of botanical description and processing of beverages, rubber and sugar, i.e., industrial approach
CO5: Gain the knowledge of energy producing plants and bio-fuels

Subject: Biochemistry, Biotechnology and Economic Botany (Practical)

At the end of the course, students will be able to

CO1: Learn and set up tissue culture technique
CO2: Prepare the different types of media for tissue culture
CO3: Perform different analytic tests for the presence of proteins, fats and carbohydrates

CO4: Learn about the economic uses of different plant groups

Year I
Subject: Environmental Studies

At the end of the course, students will be able to

CO1: Correlate the factors of Ecosystem
CO2: Pay attention towards their environment
CO3: Know the need to conserve and preserve the natural resources
CO4: Develop the skills to enhance the quality of their environment
CO5: Understand the variation among organisms through biodiversity
CO6: Analyze the population growth and will try to work upon the idea and schemes to control it
CO7: Figure out the impacts of nature (environment) on living organisms

B.Sc.(Zoology)

Semester I
Subject: Life and Diversity from Protozoa to Helminthes (1.1)

At the end of the course, students will be able to

CO1: Describe general taxonomic rules on animal classification
CO2: Classify Protista up to order level using examples from parasitic adaptation
CO3: Know about the general characters and canal system in sponges
CO4: Explain about coral and coral reefs
CO5: Distinguish between different pathogenic helminthes
CO6: Illustrate the life history of Fasciola hepatica

Subject: Cell Biology (1.2)

At the end of the course, students will be able to

CO1: Describe the ultra structure of different cell organelles of animal cell
CO2: Know about the Fluid Mosaic Model of Plasma Membrane and mechanism of active and passive transport
CO3: Explain the structure of Mitochondria
CO4: Distinguish between Microtubules and Microfilaments and Cilia and Flagella
CO5: Upgrade knowledge about lampbrush chromosomes and polytene chromosomes
CO6: Understand the concept of cell division
CO7: Explore the causes of cancer

Subject: Practical (P-101)

At the end of the course, students will be able to

CO1: Learn about the various parts of compound microscope
CO2: Know about the preparation of different permanent and temporary slides of various animal
CO3: Classify and identify various invertebrates of animal kingdom

Semester II
Subject: Life and Diversity of Annelida to Hemichordata (2.1)

At the end of the course, students will be able to

CO1: Classify the Phylum-Annelida using examples and emphasizing their biodiversty and economic importance
CO2: Understand the Metamerism in Annelida
CO3: Enhance the knowledge about the various systems of Periplaneta
CO4: Explain the Torsion and detorsion in gastropoda
CO5: Categorize Phylum Echinodermata upto order level
CO6: Sketch the diagram of various Echinoderm larvae
CO7: Illustrate the various systems of Balanoglossus

Subject: Genetics (2.2)

At the end of the course, students will be able to

CO1: Understand the concept of heredity and variations and the varietics of gene interactions
CO2: Upgrade the knowledge about Linkage and Recombination
CO3: Explain the sex determination and its mechanism
CO4: Describe the extra chromosomal and cytoplasmic inheritance
CO5: Know about the inborn errors of metabolism and multiple allelism
CO6: Discuss the nature and function of genetic material
CO7: Illustrate the process of Protein Synthesis

Subject: Practical (P-201)

At the end of the course, students will be able to

CO1: Understand the biodiversity and economic importance of different animals
CO2: Learn about the physiology of Pheretima through dissection
CO3: Demonstrate the various systems like digestive and nervous system through dissection

Semester III
Subject: Life and Diversity of Chordates-I (3.1)

At the end of the course, students will be able to

CO1: Explore the various principles of classification of animals
CO2: Classify the Phylum-Chordata using examples and emphasizing their biodiversity, economic importance and conservation measures
CO3: Correlate between subphylum urochordata and cephalochordata
CO4: Enhance the knowledge about the types- Herdmania and Amphioxus
CO5: Describe the various physiological systems of sea lamprey
CO6: Differentiate between different types of scales and fins
CO7: Categorize the super-class-Pisces upto order level and explain different systems of rohu

Subject: Mammalian Physiology (3.2)

At the end of the course, students will be able to

CO1: Classify different types of carbohydrates and lipids
CO2: Upgrade knowledge about properties and structure of sugars and fats
CO3: Differentiate between enzymes and catalyst
CO4: Explain the different transport mechanism through biomembranes
CO5: Understand mode of feeding among various animals
CO6: Describe digestion and absorbtion of nutrients in mammals
CO7: Expand the knowledge about different types of muscles and phenomenon of muscle contraction
CO8: Practice to draw well labeled diagram of bones

Subject: Prcatical (P-301)

At the end of the course, students will be able to

CO1: Enhance the knowledge about the classification, external characters and economic importance of chordates
CO2: Know about the Physiology of Labeo through dissection
CO3: Identify simple sugars, disaccharides and polysaccharide by performing Qualitative tests

Semester IV
Subject: Life and Diversity of Chardates-II (4.1)

At the end of the course, students will be able to

CO1: Classify the class-Amphibia upto order level and also explain origin and general characters of amphibians
CO2: Draw various physiological systems of Rana
CO3: Differentiate between poisonous and non-poisonous snakes
CO4: Explain the morphology and anatomy of various systems of lizard
CO5: Describe flight adaptation and migration in birds
CO6: Enhance the knowledge towards the adaptive radiations of mammals
CO7: Understand about the type study - Rat

Subject: Mammalian Physiology-II (4.2)

At the end of the course, students will be able to

CO1: Refine the knowledge towards mechanism of heart beat conduction
CO2: Understand the concept of blood pressure and Harmopoiesis
CO3: Explain the process of respiration and its regulation
CO4: Differentiate between the various mode of excretion and excretory organs
CO5: Describe the process of nerve impulse conduction
CO6: Correlate the different hormones produced by various galnds
CO7: Upgrade the facts about reproduction in mammals

Subject: Practical (P-401)

At the end of the course, students will be able to

CO1: Improve knowledge about biodiversity and economic importance of higher chordates
CO2: Draw the skeleton of Rana, Varanus and Pigeon
CO3: Estimate the amount of Hemoglobin in Human blood

Semester V
Subject: Fish and Fisheries (5.1)

At the end of the course, students will be able to

CO1: Enhance knowledge about world fisheries, their production, utilization and demand
CO2: Know about various river systems of India
CO3: Identify Fishing crafts and Gears used in Fishing
CO4: Discuss Fin fishes, Molluscs and their culture
CO5: Describe seed production, its collection and Hatchery production
CO6: Explain about nutrition of fishes-sources of food and feed composition

CO7: Illustrate the process of cryopreservation of gametes and gene manipulation

Subject: Ecology and Evolution (5.2)

At the end of the course, students will be able to

CO1: Enhance the knowledge towards Ecology and Environment
CO2: Understand the linkage between all the factors and types of Ecosystem
CO3: Describe the concept of population and its growth and regulation
CO4: Draw the different biogeochemical cycles
CO5: Magnify the idea of origin of life
CO6: Differentiate between different types of evolution
CO7: Explain the phylogeny of horse and man

Subject: Practical (P-501)

At the end of the course, students will be able to

CO1: Identify and classify different types of Fish through specimen
CO2: Differentiate between various types of nets used in Fishing
CO3: Analyze the pH in different samples of water

Semester VI
Subject: Entomology (6.1)

At the end of the course, students will be able to

CO1: Explain the various insect pests of sugarcane with their systematic position, habits and nature of damage caused by them
CO2: Practice to draw the life cycle of Pectinophora gossypiella
CO3: Describe the insect pest of sesamia inferens with its systematic position, damage caused and life cycle
CO4: Distinguish between insect pest of vegetables and stored grains
CO5: Upgrade their knowledge about biological and chemical control of insect pest
CO6: Understand the concept of integrated pest management
CO7: Conclude the important bird and Rodent pests of agriculture and their management

Subject: Developmental Biology (6.2)

At the end of the course, students will be able to

CO1: Enhance the knowledge towards developmental biology and its branches
CO2: Understand the concept of spermatogenesis and oogenesis
CO3: Explain the process of fertilization and cleavage
CO4: Construct the fate maps on blastula of frog and chick

CO5: Upgrade the knowledge towards gastrulation process
CO6: Draw the diagrams of organogenesis of chick and frog
CO7: Explore the concept of chemical induction, repair and regeneration

Subject: Practical (P-601)

At the end of the course, students will be able to

CO1: Examine external morphology, nature of damage and the host of various inspect pest
CO2: Upgrade knowledge about the developing stages of chick embryo through permanent slides
CO3: Describe Fish culturing through Project Plan

B.Sc.(Chemistry)

Semester I
Subject: Inorganic Chemistry (CH-101)

At the end of the course, students will be able to

CO1: Understand the ideas of de Broglie matter waves, Heisenberg uncertainty principle, shapes of atomic orbitals, quantum numbers, radial and angular wave functions, and probability distribution curves.
CO2: Explain Aufbau and Pauli exclusion principles, Hund's multiplicity rule, electronic configuration of elements, effective nuclear charge and slater rules, atomic and ionic radii, ionization energy, electron affinity and electro negativity, definition, methods of determination or evaluation, trends in periodic table
CO3: Describe valance bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization to explain the shape of simple inorganic molecules and ions (BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7, SO_4^{2-}, ClO_4^-). VSEPR theory to NH_3, H_3O^+, SF_4, ClF_3, ICl_2^- and H_2O and MO theory of heteronuclear (CO and NO) diatomic molecules, bond strength and bond energy, percentage ionic character from dipole moment and electro negativity difference.
CO4: Know about ionic structures (NaCl, CsCl, ZnS (Zinc Blende), CaF_2), radius ration effect and coordination number, limitation of radius ration rule, Lattice defects, semiconductors, Lattice energy and Born-Haber cycle. Solvation energy and its relation with solubility of ionic solids, polarizing power and polarisabilty of ions, Fajan's rule.

Subject: Physical Chemistry (CH-102)

At the end of the course, students will be able to

CO1: Explain the distribution of different types of velocities on the basis of Maxwell's distribution, give the idea about collision number and diameter, deviation of real gases from ideal behavior, behavior of real gases using Vander Waal's Equation.
CO2: Illustrate the critical phenomenon on the basis of critical compressibility factor, PV isotherms and law of corresponding states
CO3: Distinguish between solid, liquid and gaseous states of matter by using properties and phenomenon like surface tension, viscosity, optical rotation, symmetry element, Bragg's Equation, Bravais lattice and critical phenomenon

Subject: Organic Chemistry (CH-103)

At the end of the course, students will be able to

CO1: Describe the resonance effect, hyper conjugation, inductive effect.
CO2: Illustrate concept of isomerism, types of isomerism, optical isomerism, elements of symmetry, molecular chirality, enantiomers, optical activity, chiral and achiral molecules with two stereogenic centres, meso compounds, retention and racemization, localized and delocalized chemical bond.
CO3: Know about R & S system, Geometric isomerism, E & Z system, conformational isomerism.
CO4: Differentiate between Heterolytic and Homolytic chemical bond breaking, electrophiles and nucleophiles, carbocation, carbanion, free radical.

Subject: Practical

At the end of the course, students will be able to

CO1: Describe Redox titrations, complexometric titerations
CO2: Illustrate Iodometric titerations
CO3: Study the process of sublimation of camphor and phthalic acid

Semester II
Subject: Inorganic Chemistry (CH-201)

At the end of the course, students will be able to

CO1: Understand definition, types, effects of hydrogen bonding on properties of substances, application and brief discussion of various types of Vander Waals forces, brief introduction to metallic bond, band theory of metallic bond, semiconductors - introduction, types of applications
CO2: Explain the comparative study of the elements including, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in biosystems, chemical properties of the noble gases with emphasis on their low chemical reactivity, chemistry of xenon, structure and bonding of fluorides, oxides and oxy fluorides of xenon.

CO3: Emphasize on comparative study of properties of p-block elements, describe properties and structure of diborane, properties of borazene and structure trihalides of boron, trends in Lewis acid character of $AlCl_3$, explain catenation, Pπ - dπ bonding, carbides, fluorocarbons, silicates, silicons-general methods of preparations, properties and uses.

CO4: Describe structures of oxides of N, P, structure and relative acid strengths of oxy acids of nitrogen and phosphorus, structure of white, yellow and red phosphorus, explain oxy acids of sulpher-structures and acidic strength H^2O^2 - structure, properties and uses, explain basic properties of halogen, interhalogens types properties, hydro and oxy acids of chlorine. Structure and comparison of acid strength

Subject: Physical Chemistry (CH-202)

At the end of the course, students will be able to

CO1: Understand rate of chemical reaction, factors, order of reaction and their determination method

CO2: Describe Arrhenius equation, theories of reaction rate and transition state

CO3: Explain electrolytic conduction, factors, arrhenius theory Ostwald's dilution, transport number and determination by Hittorfs methods

CO4: Describe Kohlarausch's Law, their application, application of conductivity measurements, conductometric titration, Buffer solution and Buffer mechanism

Subject: Organic Chemistry (CH-203)

At the end of the course, students will be able to

CO1: Describe mechanism of dehydration of alcohols, dehydro halogenation of alkyl halides, Hofmann elimination 1, 2 and 1, 4 addition, Diels-Alder RX^n.

CO2: Illustrate relative stability of alkenes, aromatic compounds, Friedel-Craft RX^n, energy profile diagram, activating and deactivating substituent and orientation

CO3: Know about Saytzeff rule, markownikoff's rule, hydrogenation, hydroboration-oxidation, oxymercuration, ozonolysis, hydration, hydroxylation and oxidation with $KMnO_4$.

CO4: Differentiate between aromatic, anti-aromatic, non-aromatic, SN^1 and SN^2 RX^n, alkyl halides, alkyl, vinyl, aryl halides.

Subject: Practical

At the end of the course, students will be able to

CO1: Know about paper chromatography

CO2: Describe specific refractivity, viscosity, surface tension

CO3: Synthesize m-dinitrobenzene, iodoform

Semester III
Subject: Inorganic Chemistry (CH-301)

At the end of the course, students will be able to

CO1: Understand transition metals, properties and structure of compounds of transition metal - TiO_2, $VoCl_2$, $FeCl_3$, $CuCl_2$, and $Ni(Co)_4$
CO2: Describe transition elements of 2nd and 3rd series spectral properties and stereochemistry
CO3: Explain coordination compounds, EAN rule, nomenclature and valance bond theory of transition metal complexes
CO4: Describe properties of solvent, general characteristics, reaction in non-aqueous solvent

Subject: Physical Chemistry (CH-302)

At the end of the course, students will be able to

CO1: Describe the thermodynamic terms, process, concept of heat and work, Zeroth law of thermodynamics, laws of thermodynamics, Joule Thomson coefficient
CO2: Explain calculation of w, q, du and dH for the expansion of ideal gas under isothermal and adiabatic conditions for reversible process, bond energies and their application
CO3: Understand chemical equilibrium, thermodynamic derivation, Van't Hoff reaction Isotherm and Isochore, Le-Chatelier's Principle and its application, Clausius-Clapeyron Equation
CO4: Explain Nernst distribution law, modification of distribution law, application of distribution law

Subject: (CH-303)

At the end of the course, students will be able to

CO1: Describe methods of formation of alcohols, expoxide, phenols
CO2: Illustrate oxidative cleavage, Pinacol-Pinecolone rearrangement, ring opening of epoxide, Reimer-Tiemann RX^n , Kolbe's reaction
CO3: Know about Schotten-Baumen RX^n, hydrogen bonding, acidic nature, orientation of epoxide ring opening, molar absoptivity, effect of conjugation, chromophore, auxochrome
CO4: Differentiate between bathochromic, hypsochromic hypercromic shift and hypochromic shift

Subject: Practical

At the end of the course, students will be able to

CO1: Describe CST of phenol-water system enthalpy of ionisation of weak acid/weak base
CO2: Verify Beer-Lambert's law for $KmnO_4$ / $K_2Cr_2O_7$
CO3: Prepare cuporus chloride, Prussian blue, tetramine cupric sulphate, chrome alum, potassium - trioxalato - chromate - III

Semester IV
Subject: Inorganic Chemistry (CH-401)

At the end of the course, students will be able to

CO1: Describe lanthanides, actinides, interference of acid radicals including their removal in the analysis of basic radicals
CO2: Illustrate electronic structure, oxidation states, ionic radii, lanthanide contraction, complex formation, occurance and isolation
CO3: Know about theory of qualitative analysis and quantitative analysis
CO4: Differentiate between properties of lanthanides and actinides

Subject: Physical Chemistry (CH-402)

At the end of the course, students will be able to

CO1: Describe IInd law of thermodynamics, Carnot's cycle, thermodynamics scale of temperature, entropy, entropy as a criteria of spontaneity and equilibrium
CO2: Describe IIIrd law of thermodynamics, Gibbs and Helmholtz equation, criteria for thermodynamic equilibrium and spontaneity
CO3: Explain the electrolytic cell, different types of cells, types of reversible electrodes, Nernest equation, standard electrode potential, electro chemical series and its application
CO4: Explain the concentration cells with and without transference, potentiometric titration, determination of pH using hydrogen electrode

Subject: Organic Chemistry (CH-403)

At the end of the course, students will be able to

CO1: Describe molecular vibrations, Hooke's law, selection rules, structure and nomenclature of amines, physical properties of amines, diazonium salts, nitro compounds, aldehyde and ketones
CO2: Illustrate interpretation of IR spectra of simple organic compounds, mechanism of electrophilic substitution reactions in Nitro arenes and their reduction in acidic, neutral and alkaline medium

CO3: Know about MPV, Clemensen, Wolf-Kishner, Bayer-Villiger oxidation, Witting reaction, Mannich RX^n , Perkin, Knoevenagel RX^n, aldol, benzoin condensation
CO4: Differentiate between $LiAlH_4$ and $NaBH_4$ reductions, fingerprint region, absorption of various functional groups

Subject: Practical

At the end of the course, students will able to

CO1: Describe functional groups of organic compounds
CO2: Illustrate about alcohol, carboxylic acid, amine, nitro compounds
CO3: Know about gravimetric analysis of DMG

Semester V
Subject: Inorganic Chemistry (CH-501)

At the end of the course, students will be able to

CO1: Know about metal-ligand bonding in transition metal complexes, thermodynamic and kinetics aspects of metal complexes
CO2: Describe substitution reactions of square planar complexes of platinum (II) and factor affecting stability
CO3: Illustrate types of magnetic behavior, L-S coupling, orbital contribution to magnetic moments, application of magnetic moment data for 3D metal complexes
CO4: Explain the types of electronic transitions, selection rules for d-d- transition, orgel-energy level diagram

Subject: Physical Chemistry (CH-502)

At the end of the course, students will be able to

CO1: Describe Quantum mechanics with explaining the postulates of Quantum mechanics, operator and their relations, wave function
CO2: Understand physical properties and molecular structure by the use of dipole moment, magnetic permeability and magnetic properties
CO3: Understand basic concepts of spectroscopy, born oppenheimer approximation and degree of freedom, rotational spectrum
CO4: Explain selection rules, vibrational and rotational spectra of molecules

Subject: Organic Chemistry (CH-503)

At the end of the course, students will be able to

CO1: Understand NMR spectroscopy, PMR spectrum, shielding - deshielding of proton with magnetic equivalence of protons

CO2: Describe PMR spectra of molecules with structure determination of organic compounds
CO3: Explain carbohydrates, mechanism of osazone formation, conversion, mechanism of mutrarotation
CO4: Describe disaccharide and polysaccharides organometallic compounds - structure, formation and chemical reaction.

Subject: Practical

At the end of the course, students will be able to

CO1: Analyze acid and basic radicals by using semi-micro qualitative method
CO2: Illustrate acidic and basic radicals
CO3: Determine Rf values and identify organic compounds in green leaf and colured organic compounds by thin layer chromatography

Semester VI
Subject: Inorganic Chemistry (CH-601)

At the end of the course, students will be able to

CO1: Illustrate nomenclature and classification of organometallic compounds, metal-ethylenic complexes, nature of bonding in metal carbonyls
CO2: Differentiate between acid and base by using different concept: Lewis, Arrhenius, Bronsted-Lowry and Lux-flood symbiosis
CO3: Explain metalloporphyrins with special reference to haemoglobin and myoglobin, biological role of alkali and alkaline earth metal
CO4: Describe silicon and phosphazenes, their preparation, properties, structure and uses

Subject: Physical Chemistry (CH-602)

At the end of the course, students will be able to

CO1: Understand electronic spectrum by potential energy curves and Frank-Codon Principle
CO2: Explain interaction by radiation with matter, photochemistry laws and different types of processes
CO3: Describe solution, its types, use of their colligative properties, ideal and non-ideal solution
CO4: Understand phase component, degree of freedom, phase equilibria of one component and two component system

Subject: Organic Chemistry (CH-603)

At the end of the course, students will able to

CO1: Explain heterocyclic compound with mechanism of electrophilic substitution and nucleophilic substitution
CO2: Describe five and six membered heterocycles with their synthesis, and describe organosulphur compound, methods of formation and chemical reaction
CO3: Understand organic synthesis via enolates and reaction, mechanism and st. of synthetic polymers
CO4: Illustrate amino acid, protein and peptide structure, sythesis and classification

Subject: Practical

At the end of the course, students will able to

CO1: Determine strength of monobasic and dibasic acid solution conductometrically, potentiometrically, pH-metrically
CO2: Determine molecules weight of non-volatile solute by Rast method
CO3: Synthesize organic compounds like p-bromoaniline from p-bromoacetanilide and m-nitroaniline from m-dinitrobenzene

Programme Name - B.Sc. (Non-Med.)

Programme Outcomes of B.Sc. (Non-Med.)

The programme empowers the students to

PO1: Acquire the knowledge with facts and figures related to various science subjects like Physics, Chemistry, Mathematics

PO2: Understand the basic concept of scientific theories, their practicality and relevance in day-to-day life

PO3: The students would become aware of the influence of chemistry on environment and other areas beyond scientific field

PO4: Basic knowledge of mathematics and practical application of computer programming in C-language to solve various numerical problems

PO5: Confidence level of students would be enhanced for appearing before practical examiners

PO6: The competency of students in exploring Interdisciplinary scientific research areas would be chiseled

PO7: Efficiency to extract information, formulate and solve problems in a systematic way would be enhanced

PO8: The programme would enable the students to prepare for various competitive exams in diverse fields such as Banking, Industries, Defence and other Public services. It would also enable them to go for higher studies and for master degree in Physics/chemistry/maths and for pursuing research.

Programme Specific Outcomes of B.Sc.(Non-Med.)

PSO1: Acquire analytical and logical skills through various mathematical tools and techniques to make the students well equipped to appear in various competitive examination to pursue higher studies, like Banking, Civil Services, Defence and Industrial Services, etc.

PSO2: Acquire the ability to explain the structure, reactivity and functions of various chemical compounds in various fields and in daily life and to understand the proper handling of chemicals and instruments

PSO3: The programme enables the stduents to apply problem solving skills and the knowledge of computer science to solve real world problems

PSO4: The programme empowers the students with practical skills to comprehend the physiology and other functions of vital systems of animals and to develop entrepreneurial skills in the fields of sericulture, apiculture and aquaculture etc.

PSO5: The programme enables the stduents to gain knowledge about fundamental phenomena of Physics and their applications in everyday life. They will get trained in practical aspects and their problem solving skills will be enhanced

PSO6: Efficiency to extract information, formulate and solve problems in a systematic way is enhanced

B.Sc.(Chemistry)

Semester I
Subject: Inorganic Chemistry (CH-101)

At the end of the course, students will be able to

CO1: Understand the ideas of de Broglie matter waves, Heisenberg uncertainty principle, shapes of atomic orbitals, quantum numbers, radial and angular wave functions, and probability distribution curves.
CO2: Explain Aufbau and Pauli exclusion principles, Hund's multiplicity rule, electronic configuration of elements, effective nuclear charge and slater rules, atomic and ionic radii, ionization energy, electron affinity and electro negativity, definition, methods of determination or evaluation, trends in periodic table
CO3: Describe valance bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization to explain the shape of simple inorganic molecules and ions (BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7, SO_4^{2-}, ClO_4^-). VSEPR theory to NH_3, H_3O^+, SF_4, ClF_3, ICl_2^- and H_2O and MO theory of heteronuclear (CO and NO) diatomic molecules, bond strength and bond energy, percentage ionic character from dipole moment and electro negativity difference.
CO4: Know about ionic structures (NaCl, CsCl, ZnS (Zinc Blende), CaF_2), radius ration effect and coordination number, limitation of radius ration rule, Lattice defects, semiconductors, Lattice energy and Born-Haber cycle. Solvation energy and its relation with solubility of ionic solids, polarizing power and polarisabilty of ions, Fajan's rule.

Subject: Physical Chemistry (CH-102)

At the end of the course, students will be able to

CO1: Explain the distribution of different types of velocities on the basis of Maxwell's distribution, give the idea about collision number and diameter, deviation of real gases from ideal behavior, behavior of real gases using Vander Waal's Equation.
CO2: Illustrate the critical phenomenon on the basis of critical compressibility factor, PV isotherms and law of corresponding states
CO3: Distinguish between solid, liquid and gaseous states of matter by using properties and phenomenon like surface tension, viscosity, optical rotation, symmetry element, Bragg's Equation, Bravais lattice and critical phenomenon

Subject: Organic Chemistry (CH-103)

At the end of the course, students will be able to

CO1: Describe the resonance effect, hyper conjugation, inductive effect.

CO2: Illustrate concept of isomerism, types of isomerism, optical isomerism, elements of symmetry, molecular chirality, enantiomers, optical activity, chiral and achiral molecules with two stereogenic centres, meso compounds, retention and racemization, localized and delocalized chemical bond.

CO3: Know about R & S system, Geometric isomerism, E & Z system, conformational isomerism.

CO4: Differentiate between Heterolytic and Homolytic chemical bond breaking, electrophiles and nucleophiles, carbocation, carbanion, free radical.

Subject: Practical

At the end of the course, students will be able to

CO1: Describe Redox titrations, complexometric titerations

CO2: Illustrate Iodometric titerations

CO3: Study the process of sublimation of camphor and phthalic acid

Semester II
Subject: Inorganic Chemistry (CH-201)

At the end of the course, students will be able to

CO1: Understand definition, types, effects of hydrogen bonding on properties of substances, application and brief discussion of various types of Vander Waals forces, brief introduction to metallic bond, band theory of metallic bond, semiconductors - introduction, types of applications

CO2: Explain the comparative study of the elements including, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in biosystems, chemical properties of the noble gases with emphasis on their low chemical reactivity, chemistry of xenon, structure and bonding of fluorides, oxides and oxy fluorides of xenon.

CO3: Emphasize on comparative study of properties of p-block elements, describe properties and structure of diborane, properties of borazene and structure trihalides of boron, trends in Lewis acid character of $AlCl_3$, explain catenation, Pπ - dπ bonding, carbides, fluorocarbons, silicates, silicons-general methods of preparations, properties and uses.

CO4: Describe structures of oxides of N, P, structure and relative acid strengths of oxy acids of nitrogen and phosphorus, structure of white, yellow and red phosphorus, explain oxy acids of sulpher-structures and acidic strength H^2O^2 - structure, properties and uses, explain basic properties of halogen, interhalogens types properties, hydro and oxy acids of chlorine. Structure and comparison of acid strength

Subject: Physical Chemistry (CH-202)

At the end of the course, students will be able to

CO1: Understand rate of chemical reaction, factors, order of reaction and their determination method
CO2: Describe Arrhenius equation, theories of reaction rate and transition state
CO3: Explain electrolytic conduction, factors, arrhenius theory Ostwald's dilution, transport number and determination by Hittorfs methods
CO4: Describe Kohlarausch's Law, their application, application of conductivity measurements, conductometric titration, Buffer solution and Buffer mechanism

Subject: Organic Chemistry (CH-203)

At the end of the course, students will be able to

CO1: Describe mechanism of dehydration of alcohols, dehydro halogenation of alkyl halides, Hofmann elimination 1, 2 and 1, 4 addition, Diels-Alder RX^n.
CO2: Illustrate relative stability of alkenes, aromatic compounds, Friedel-Craft RX^n, energy profile diagram, activating and deactivating substituent and orientation
CO3: Know about Saytzeff rule, markownikoff's rule, hydrogenation, hydroboration-oxidation, oxymercuration, ozonolysis, hydration, hydroxylation and oxidation with $KMnO_4$.
CO4: Differentiate between aromatic, anti-aromatic, non-aromatic, SN^1 and SN^2 RX^n, alkyl halides, alkyl, vinyl, aryl halides.

Subject: Practical

At the end of the course, students will be able to

CO1: Know about paper chromatography
CO2: Describe specific refractivity, viscosity, surface tension
CO3: Synthesize m-dinitrobenzene, iodoform

Semester III
Subject: Inorganic Chemistry (CH-301)

At the end of the course, students will be able to

CO1: Understand transition metals, properties and structure of compounds of transition metal - TiO_2, $VoCl_2$, $FeCl_3$, $CuCl_2$, and $Ni(Co)_4$
CO2: Describe transition elements of 2nd and 3rd series spectral properties and stereochemistry
CO3: Explain coordination compounds, EAN rule, nomenclature and valance bond theory of transition metal complexes

CO4: Describe properties of solvent, general characteristics, reaction in non-aqueous solvent

Subject: Physical Chemistry (CH-302)

At the end of the course, students will be able to

CO1: Describe the thermodynamic terms, process, concept of heat and work, Zeroth law of thermodynamics, laws of thermodynamics, Joule Thomson coefficient
CO2: Explain calculation of w, q, du and dH for the expansion of ideal gas under isothermal and adiabatic conditions for reversible process, bond energies and their application
CO3: Understand chemical equilibrium, thermodynamic derivation, Van't Hoff reaction Isotherm and Isochore, Le-Chatelier's Principle and its application, Clausius-Clapeyron Equation
CO4: Explain Nernst distribution law, modification of distribution law, application of distribution law

Subject: (CH-303)

At the end of the course, students will be able to

CO1: Describe methods of formation of alcohols, expoxide, phenols
CO2: Illustrate oxidative cleavage, Pinacol-Pinecolone rearrangement, ring opening of epoxide, Reimer-Tiemann RX^n , Kolbe's reaction
CO3: Know about Schotten-Baumen RX^n, hydrogen bonding, acidic nature, orientation of epoxide ring opening, molar absoptivity, effect of conjugation, chromophore, auxochrome
CO4: Differentiate between bathochromic, hypsochromic hypercromic shift and hypochromic shift

Subject: Practical

At the end of the course, students will be able to

CO1: Describe CST of phenol-water system enthalpy of ionisation of weak acid/weak base
CO2: Verify Beer-Lambert's law for $KmnO_4$ / $K_2Cr_2O_7$
CO3: Prepare cuporus chloride, Prussian blue, tetramine cupric sulphate, chrome alum, potassium - trioxalato - chromate - III

Semester IV
Subject: Inorganic Chemistry (CH-401)

At the end of the course, students will be able to

CO1: Describe lanthanides, actinides, interference of acid radicals including their removal in the analysis of basic radicals
CO2: Illustrate electronic structure, oxidation states, ionic radii, lanthanide contraction, complex formation, occurance and isolation
CO3: Know about theory of qualitative analysis and quantitative analysis
CO4: Differentiate between properties of lanthanides and actinides

Subject: Physical Chemistry (CH-402)

At the end of the course, students will be able to

CO1: Describe IInd law of thermodynamics, Carnot's cycle, thermodynamics scale of temperature, entropy, entropy as a criteria of spontaneity and equilibrium
CO2: Describe IIIrd law of thermodynamics, Gibbs and Helmholtz equation, criteria for thermodynamic equilibrium and spontaneity
CO3: Explain the electrolytic cell, different types of cells, types of reversible electrodes, Nernest equation, standard electrode potential, electro chemical series and its application
CO4: Explain the concentration cells with and without transference, potentiometric titration, determination of pH using hydrogen electrode

Subject: Organic Chemistry (CH-403)

At the end of the course, students will be able to

CO1: Describe molecular vibrations, Hooke's law, selection rules, structure and nomenclature of amines, physical properties of amines, diazonium salts, nitro compounds, aldehyde and ketones
CO2: Illustrate interpretation of IR spectra of simple organic compounds, mechanism of electrophilic substitution reactions in Nitro arenes and their reduction in acidic, neutral and alkaline medium
CO3: Know about MPV, Clemensen, Wolf-Kishner, Bayer-Villiger oxidation, Witting reaction, Mannich RX^n , Perkin, Knoevenagel RX^n, aldol, benzoin condensation
CO4: Differentiate between $LiAlH_4$ and $NaBH_4$ reductions, fingerprint region, absorption of various functional groups

Subject: Practical

At the end of the course, students will able to

CO1: Describe functional groups of organic compounds
CO2: Illustrate about alcohol, carboxylic acid, amine, nitro compounds
CO3: Know about gravimetric analysis of DMG

Semester V
Subject: Inorganic Chemistry (CH-501)

At the end of the course, students will be able to

CO1: Know about metal-ligand bonding in transition metal complexes, thermodynamic and kinetics aspects of metal complexes
CO2: Describe substitution reactions of square planar complexes of platinum (II) and factor affecting stability
CO3: Illustrate types of magnetic behavior, L-S coupling, orbital contribution to magnetic moments, application of magnetic moment data for 3D metal complexes
CO4: Explain the types of electronic transitions, selection rules for d-d- transition, orgel-energy level diagram

Subject: Physical Chemistry (CH-502)

At the end of the course, students will be able to

CO1: Describe Quantum mechanics with explaining the postulates of Quantum mechanics, operator and their relations, wave function
CO2: Understand physical properties and molecular structure by the use of dipole moment, magnetic permeability and magnetic properties
CO3: Understand basic concepts of spectroscopy, born oppenheimer approximation and degree of freedom, rotational spectrum
CO4: Explain selection rules, vibrational and rotational spectra of molecules

Subject: Organic Chemistry (CH-503)

At the end of the course, students will be able to

CO1: Understand NMR spectroscopy, PMR spectrum, shielding - deshielding of proton with magnetic equivalence of protons
CO2: Describe PMR spectra of molecules with structure determination of organic compounds
CO3: Explain carbohydrates, mechanism of osazone formation, conversion, mechanism of mutrarotation

CO4: Describe disaccharide and polysaccharides organometallic compounds - structure, formation and chemical reaction.

Subject: Practical

At the end of the course, students will be able to

CO1: Analyze acid and basic radicals by using semi-micro qualitative method
CO2: Illustrate acidic and basic radicals
CO3: Determine Rf values and identify organic compounds in green leaf and colured organic compounds by thin layer chromatography

Semester VI
Subject: Inorganic Chemistry (CH-601)

At the end of the course, students will be able to

CO1: Illustrate nomenclature and classification of organometallic compounds, metal-ethylenic complexes, nature of bonding in metal carbonyls
CO2: Differentiate between acid and base by using different concept: Lewis, Arrhenius, Bronsted-Lowry and Lux-flood symbiosis
CO3: Explain metalloporphyrins with special reference to haemoglobin and myoglobin, biological role of alkali and alkaline earth metal
CO4: Describe silicon and phosphazenes, their preparation, properties, structure and uses

Subject: Physical Chemistry (CH-602)

At the end of the course, students will be able to

CO1: Understand electronic spectrum by potential energy curves and Frank-Codon Principle
CO2: Explain interaction by radiation with matter, photochemistry laws and different types of processes
CO3: Describe solution, its types, use of their colligative properties, ideal and non-ideal solution
CO4: Understand phase component, degree of freedom, phase equilibria of one component and two component system

Subject: Organic Chemistry (CH-603)

At the end of the course, students will able to

CO1: Explain heterocyclic compound with mechanism of electrophilic substitution and nucleophilic substitution

CO2: Describe five and six membered heterocycles with their synthesis, and describe organosulphur compound, methods of formation and chemical reaction
CO3: Understand organic synthesis via enolates and reaction, mechanism and st. of synthetic polymers
CO4: Illustrate amino acid, protein and peptide structure, sythesis and classification

Subject: Practical

At the end of the course, students will able to

CO1: Determine strength of monobasic and dibasic acid solution conductometrically, potentiometrically, pH-metrically
CO2: Determine molecules weight of non-volatile solute by Rast method
CO3: Synthesize organic compounds like p-bromoaniline from p-bromoacetanilide and m-nitroaniline from m-dinitrobenzene

B.Sc.(Mathematics)

Semester I
Subject: Algebra (12BSM11)

At the end of the course, students will be able to

CO1: Know about the basic concept of matrices and identify its types
CO2: Learn about Eigen values and Eigen vectors of a matrix and to apply Caley Hamilton Theorem for finding the inverse of matrix
CO3: Learn to solve system of homogeneous and non-homogeneous linear equations
CO4: Find the roots of cubic and biquadratic equations
CO5: Identify the nature of roots of algebraic equations
CO6: Analyze and illustrate examples of different type of matrices

Subject: Calculus (12BSM112)

At the end of the course, students will be able to

CO1: Familiarize with the definition of limits and its basic properties
CO2: Learn about continuous functions and types of discontinuity
CO3: Know about Differentiability, Successive differentiation and to apply Leibnitz Theorem, uses and applications of Maclaurin and Taylor series expansion
CO4: Study about asymptotes, singular points and curvature
CO5: Trace the curve in cartesian, parametric and polar co-ordinates
CO6: Learn and apply reduction formulae
CO7: Utilize curve tracing for rectification, quadrature, volumes and surfaces of solids of revolution

Subject: Solid Geometry (12BSM113)

At the end of the course, students will be able to

CO1: Learn general equation of second degree and tracing of conics
CO2: Understand confocal conics and polar equations of a conic, tangents and normal to the conic
CO3: Study about Sphere, Cone, Cylinder
CO4: Know about central conicoids, equation of tangent plane, director sphere. Enveloping cone of coincoid
CO5: Learn the properties of Paraboloids, Circular section
CO6: Describe generating lines, Xonfocal conicoid. Reduction of second degree equation

Semester II
Subject: Number Theory and Trigonometry (12BSM121)

At the end of the course, students will be able to

CO1: Learn the basic concepts of divisibility, primes, Fundamental theorems of arithmetic
CO2: Solve linear congruences and Diophantine Equations
CO3: Apply Fermat's Theorem, Chinese Remainder Theorem
CO4: Describe Quadratic residues, Greatest Integer Function, number-of-divisions function, sum of divisors function moebius function
CO5: Apply De Moivre's Theorem
CO6: Understand the circular and hyperbolic functions and their properties
CO7: Study about inverse circular and hyperbolic functions and their properties logarithm of a complex quantity, Gregory's series, summation of trigonometry series

Subject: Ordinary Differential Equation (12BSM122)

At the end of the course, students will be able to

CO1: Understand geometrical meaning of differential equations and study exact differential equations
CO2: Solve first order higher degree equations, Lagrange's equation, Clairaut's equation
CO3: Know about orthogonal trajectories in both cartesion and polar co-ordinates
CO4: Study linear differential equation of second order and its reduction to normal form
CO5: Learn method of variation of parameters and method of undetermined coefficient
CO6: Study ordinary simultaneous differential equations, total differential equations

Subject: Vector-Calculus (12BSM123)

At the end of the course, students will be able to

CO1: Know about the basic concept of vectors and their product

CO2: Be familiar with gradient of scalar point function and its characteristics
CO3: Learn about divergence and curl of vector point function and its characterization
CO4: Describe curvilinear co-ordinates in terms of cylindrical, cartesian and spherical co-ordinates
CO5: Find line integral, surface integral and volume integral
CO6: Analyze the problems based on Gauss divergence, Green's and Stoke's theorem

Semester III
Subject: Advanced Calculus (12BSM231)

At the end of the course, students will be able to

CO1: Understand continuity, sequential continuity and its properties
CO2: Learn about uniform continuity and chain rule of differentiability
CO3: Learn about Rolle's Theorem, Lagrange's Mean Value Theorem and their geometrical interpretation
CO4: Know about partial and total differentiation
CO5: Describe composite function and implicit functions
CO6: Understand the concept of differentiability of real valued functions of two variable
CO7: Know about the curves and their tangents, principle normals and binormals
CO8: Discuss the Bertrand curves and one parameter family of surfaces

Subject: Partial Differential Equations (12BSM232)

At the end of the course, students will be able to

CO1: Establish a fundamental familiarity with Partial Differential Equations
CO2: Distinguish between linear and non-linear partial differential equations
CO3: Find the complete integral, singular solution and general solutions
CO4: Solve linear and non-linear homogeneous and non-homogeneous equations with constant co-efficients and with variable co-efficient
CO5: Classify the linear partial differential equations of second order
CO6: Use method of separation of variables

Subject: Statics (12BSM233)

At the end of the course, students will be able to

CO1: Understand the concept of composition and resolution of forces
CO2: Know about the moments and couples
CO3: Able to find the analytical conditions of equilibrium of co-planar forces
CO4: Be familiar with friction, centre of gravity, virtual work
CO5: Understand about forces in 3-D and Poinsot's central axis
CO6: Distinguish between stable and unstable equilibrium
CO7: Be familiar with wrenches, null lines and nullplanes

Semester IV
Subject: Sequence and Series (12BSM241)

At the end of the course, students will be able to

CO1: Learn Boundedness, limit points, interior and closure of sets
CO2: Understand neighborhoods, isolated points, limit points and compact sets neighbourhoods
CO3: Learn about sequences and their convergence
CO4: Understand the concept of bounded and monotonic sequences
CO5: Learn the concept of infinite series, their convergence and divergence
CO6: Learn using 'Comparison Test' to determine the convergence and divergence of some series
CO7: Learn the concept of alternating series and arbitrary series

Subject: Special Functions and Integral Transforms (12BSM242)

At the end of the course, students will be able to

CO1: Learn about power series and series solution of differential equations
CO2: Understand Bessel functions and orthogonality of Bessel's functions. Legendre and Hermite differential equations and their solutions
CO3: Study Laplace transforms, inverse Laplace transforms, Fourier transforms
CO4: Apply Laplace transformation and Fourier transformation to solve differential equations
CO5: Describe Legendre and Hermite functions and relation between Fourier transform and Laplace transform

Subject: Programming in C and Numerical Methods (12BSM243)

At the end of the course, students will be able to

CO1: Be familiar with Programmer's model of a Computer, Algorithms, Flowcharts, Data type
CO2: Distinguish between logical and conditional statements
CO3: Know the implementation of loops, switch statement and case control statement
CO4: Understand the concept of Strings, Operations, Pointers, Arrays and Functions
CO5: Solve Algebraic and Transcendental equations by different methods
CO6: Find the solution of linear equations by Crout's, Gauss-Seidal's method

Semester V
Subject: Real Analysis (12BSM351)

At the end of the course, students will be able to

CO1: Learn the fundamental theorem of Integral Calculus
CO2: Understand the mean value theorem of Integral Calculus
CO3: Learn the convergence of Improper Integrals
CO4: Learn Abel's and Dirichlet's test of convergence
CO5: Understand continuity, differentiability and integrability of an integral of a function
CO6: Understand the concept of Metric space
CO7: Learn Cantor's intersection theorem, Baire's category theorem
CO8: Understand continuous function, continuity in relation with compactness, connectedness
CO9: Learn Bolzano Weierstarss Property and Finite Intersection Property

Subject: Groups and Rings (12BSM352)

At the end of the course, students will be able to

CO1: Be familiar with the concept of Groups, Subgroups, Cyclic groups, Cosets, Normal subgroups and Quotient groups
CO2: Learn about homeomorphisms, automorphism, isomorphism and inner automorphism
CO3: Learn the concept of permutation group, even and odd permutations, alternating groups, centre of group and derived group
CO4: Understand the concept of Rings, subrings, integral domains, fields, characteristics of ring and field of quotients of integral domain
CO5: Be familiar with Ring homomorphism, principal, maximal and prime ideals
CO6: Understand the concept of Euclidean rings, polynomial rings, Eisenstein's criterion

Subject: Numerical Analysis (12BSM363)

At the end of the course, students will be able to

CO1: Learn about finite differences operators and their relations
CO2: Distinguish between Newton's forward and Newton's backward interpolation formulae
CO3: Study probability distribution of random variables, Binomial, Poisson's, Normal distributions
CO4: Solve Eigen value problems using different methods
CO5: Use different methods to find the numerical solution of ordinary differential equation
CO6: Solve numerical integration with the help of different rules and formulae

Semester VI
Subject: Real and Complex Analysis (12BSM361)

At the end of the course, students will be able to

CO1: Learn Jacobians, Beta and Gamma functions, double and triple integrals
CO2: Understand Fourier series and its properties, half range series
CO3: Learn the extended complex plane and stereographic projections of complex numbers
CO4: Study continuity and differentiability of complex numbers, analytic functions and apply it to solve real life problems
CO5: Know mappings by elementary functions
CO6: Solve problem of conformal mapping, Mobius transformations, fixed points

Subject: Linear Algebra (12BSM362)

At the end of the course, students will be able to

CO1: Be familiar with vector spaces, subspaces, finitely generated vector spaces
CO2: Understand the concept of basis and dimensions and existence theorem for basis
CO3: Study the concept of dual spaces, bidual spaces, null space, range space, rank and nullity
CO4: Know about linear transformations and matrices associated with them
CO5: Introduce the concept of Inner Product Spaces
CO6: Study orthogonality of vectors, orthogonal complements, orthogonal and orthogonal basis

Subject: Dynamics (12BSM353)

At the end of the course, students will be able to

CO1: Know about velocity and acceleration along radial, transverse, tangential and normal directions
CO2: Learn about the concepts of Mass, Momentum and Force
CO3: Understand motion on smooth and rough plane
CO4: Be familiar with projectile motion of a particle in a plane and vector angular velocity
CO5: Know the basic concept of motion of a rigid body and a particle in 3-D
CO6: Study acceleration in terms of different co-ordinate systems

B.Sc.(Physics)

Semester I
Subject: Mechanics (PHY-101)

At the end of the course, students will be able to

CO1: Understand the terminology used in Classical Mechanics and dynamics of rigid bodies such as constraints, generalized co-ordinates, moment of inertia etc.
CO2: Study the behaviour of rigid body dynamics
CO3: Develop the ability to analyze the problem in simple and logical manner and solve them by applying Principles of dynamics
CO4: Apply Lagrangian formalism of analyze problems in mechanics and solving them for L.H.O., Atwood's machine and simple pendulum, calculation of moment of inertia of regular bodies
CO5: Develop skills to solve numerical problems on it
CO6: Apply the concept and Principle of kinematics in finding the translational K.E., K.E. and acceleration of a rolling body on an inclined plane

Subject: Electricity and Magnetism (PHY-102)

At the end of the course, students will be able to

CO1: Have basic understanding of vectors, scalars and their products, differentiation and integrals of Vector fields, Electrostatic field and Magnetic field
CO2: Classify the magnetic materials, differences between electric and magnetic fields and different types of integrals
CO3: Deduce the Maxwell's equation, Boundary conditions, Gauss's theorem, Stoke's theorem and Poynting theorem
CO4: Solve problems relating vector products, various equations like Poisson's and Laplace equation and magnetism
CO5: Use the mathematical tools and terms learnt above to study various properties of electric., magnetic and electromagnetic fields
CO6: Apply fundamentals of electricity and magnetism for practical applications equation Propagation of E.M. waves in telecommunication

Subject: Physics Practical (PHY-103)

At the end of the course, students will be able to

CO1: Understand the basic apparatus like Vernier Calliper, Screw Gauge
CO2: Become aware about precision and error in the measurement
CO3: Take reading, do calculation and analyze the result obtained for the experiments related to mechanics, electricity and magnetism, electrodes

CO4: Correlate the result of performed practical in daily life and can also seek new applications

Semester II

Subject: Properties of Matter, Kinetic Theory and Relativity (PHY-201)

At the end of the course, students will be able to

CO1: Understand basic terms such as elastic constant, Hook's law, modulus of elasticity, event, observer, inertial and non-inertial frame of reference, variant and invariant quantity
CO2: Differentiate between Galilian and Lorentz transformation, inertial and non-inertial frame of reference
CO3: Classify Transparent phenomena and different types of speed
CO4: Describe the torsion of a cylinder, bending of beam, law of equipartition of energy. Maxwell's law of speed distribution, tansfer of energy and momentum, Michelson-Morley experiment
CO5: Analyze the effects of relativity by Newtonian and special theory of relativity
CO6: Various application of Lorentz transformation in length contraction, time dilation, variation of mass with velocity and mass-energy equivalence

Subject: EMI and Electronic Devices (PHY-202)

At the end of the course, students will be able to

CO1: Understand basic knowledge of Semiconductor devices, Amplifier, Oscillators, feedback circuit and basic terms of A.C., D.C.
CO2: Classify various types of transistors, transistor amplifiers, feedback circuit, oscillators and filters
CO3: Describe D.C. loadline and frequency response of RC coupled amplifier and C.R.O.
CO4: Deduce phase relation between alternating e.m.f. and A.C. in circuit containing LR, LC and LCR connected in series
CO5: Analyze band-width, Quality factor and sharpness of resonance in series and parallel resonant circuit
CO6: Solve problems based on transistor biasing and resonant circuit

Subject: Physics Practical (PHY-203)

At the end of the course, students will be able to

CO1: Understand the basic apparatus like travelling microscope, Galvanometer
CO2: Aware about precision and error calculation in measurement and deal with liquid based on their viscosity
CO3: Take reading, do calculation and analyze the result obtained for the experiments related to electronics, simple mechanics, and verify the values of different signals

CO4: Co-relate the result of performed practical in daily life and can also seek new applications

Semester III
Subject: Computer Programming, Thermodynamics (PHY-301)

At the end of the course, students will be able to

CO1: Illustrate Computer programming along with algorithms used to build the programme, flowcharts, binary representation, law of thermodynamics, specific heat, thermodynamic energies
CO2: Classify different typeS of statements (executable and non-executable statements), IF, DO and GOTO statements
CO3: Describe: Phase diagrams and triple point of a substance, liquefaction of gases, Joule Thomson effect, Nernst Heat law, Joule's free expansion
CO4: Deduce expression of Internal energy (U), Helm holtz function (F), Enthalpy (H)_, Gibbs function (G) Clausius-clapeyron latent heat equation
CO5: Apply Maxwell relation in the derivation of relation between entropy, specific heat and thermo dynamic varibles
CO6: Analyze Joule's free expansion and Joule Thomson effect and specific heat of solid

Subject: Optics-I (PHY-302)

At the end of the course, students will be able to

CO1: Understand the basic concept of transverse and longitudinal waves their speed, Fourier analysis of complex waves, basic aspects of geometric optics, unit planes, nodal planes, matrix methods in Paraxial optics, Aberrations, interference by division of wavefront
CO2: Distinguish between geometrical optics and physical optics, different types of aberrations and achromatism
CO3: Deduce the thick and thin lens formulae, Fourier analysis of complex waves and its application for the solution of triangular and rectangular wave Fourier transform and its application to various functions
CO4: Classify the behaviour of light on the basis of wave nature. Interference by division of wave front and division of amplitude
CO5: Use the interference by division of wave front, Fresnel Biprism and its applications to determine the wave length of sodium light and thickness of mica sheet
CO6: Understand various lens defects and their remedies

Subject: Physics Practical (PHY-303)

At the end of the course, students will be able to

CO1: Understand the basic knowledge of apparatus like telescope, microscope, vernier calliper
CO2: Use different types of eyepiece acc. to their application and different types of transistors and execution of comp. programming
CO3: Analyze sources of error and correct errors
CO4: To seek and co-relate the application of studied practical in daily life

Semester IV
Subject: Statistical Mechanics (PHY-401)

At the end of the course, students will be able to

CO1: Illustrate terms: Probability combinations, possessing maximum and minimum probability, entropy, specific heat, accessible states, phase space, microstates and macrostates
CO2: Classify: Quantum statistics, classical statistics and correlate the expression of B.E. and FD statistics
CO3: Describe postulates of statistical physics, distribution of molecules in 2 boxes, statistical fluctuation constraints
CO4: Apply Fermion and Boson statistics to many particle problems, B.E. statistics to planck's radiation law, B.E. gas
CO5: Deduce Boltzman's distribution law and find A and B expression of β parameter, zero point energy, specific heat of metals and its solution
CO6: Analyze examples of Ideal Bose Systems and Fermi systems, electron gas in metals

Subject: Optics-II (PHY-402)

At the end of the course, students will be able to

CO1: Understand the basic concept of Interference by Division of Amplitude, Diffraction and its types and Polarization, Double Refraction
CO2: Distinguish between Fresnel's and Frounhoffer Diffraction and Interference, Diffraction and Polarization
CO3: Apply phenomenon of interference for a Wedge shape film, Newton rings, colour of thin films. Interferometers and its applications for standardization of a meter and wavelength determination
CO4: Deduce the formulae for diffraction at single slit, double slit and N slit and to calculate Dispersive power and resolving Powers of various optical instruments
CO5: Analyze the phenomenon of polarization by double refraction, by reflection, analysis of polarized slight, Nicol prism, Quarter wave plate and half wave plate

CO6: Methods of production and detection of plane polarized light and circularly polarized light and elliptically polarized light and to study various Polarimeters and optical activity

Subject: Physics Practical (PHY-403)

At the end of the course, students will be able to

CO1: Have basic knowledge of semiconductor diode, rectifiers and filter circuits
CO2: Aware about precision and error calculation in measurement and deal with series and parallel resonant circuits, to distinguish between them
CO3: Take reading, do calculation and analyze the results obtained for the experiments related to optics, electrodes
CO4: Co-relate the result of performed practicals in daily life

Semester V
Subject: Solid State Physics (PHY-501)

At the end of the course, students will be able to

CO1: Illustrate: Crystal structure, unit cell, periodicity, lattice, Basis, in 2D and 3D, symmetry operations, reciprocal lattice, specific heat
CO2: Classify: Reciprocal lattices: simple cubic, Body centered cubic, Face centered cubic Crystal structure, ZnS, Nacl, Diamond
CO3: Demonstrate: Bragg's law, XRD Diffraction, Einstein theory of specific heat, arrangements of atoms and ions in crystalline structure
CO4: Deduce the expression for Bragg's law, specific heat of solids, Debye model of specific heat
CO5: Analyze: Bravais lattice in 2D and 3D dimension , Crystal plane and Miller indices
CO6: Apply inter planer spacing and crystal planes in various solid structure, Einstein equation in solving numerical problems

Subject: Quantum Mechanics (PHY-502)

At the end of the course, students will be able to

CO1: Understand the failure of Classical Mechanics and historical development of Quantum mechanics
CO2: Interpret experiments that reveal particle nature of radiation and wave behaviour of material particles
CO3: Master the basic concepts and principles of Quantum mechanics with the help of wave mechanical formulations and derive the Schrodinger wave equation
CO4: Solve Schrodinger wave equation for systems like particle in a box, Simple Harmonic Oscillator and tunnel effect

CO5: Develop a clear understanding of transition from classical to Quantum mechanics and applications to complicated systems at very small scale of distance and relativistic energy

Subject: Physics Practical (PHY-503)

At the end of the course, students will be able to

CO1: Understand transistor amplifiers, the laser action phenomenon, computer programming, optics
CO2: Deal with the different types of sources (light) to get the results
CO3: Analyze the results obtained in computer programming and experiments related to optics, electronics
CO4: Have a knowledge of practical applications in daily life

Semester VI
Subject: Atomic Molecular and Laser Physics (PHY-601)

At the end of the course, students will be able to

CO1: Illustrate: Change in behaviour of atoms in external applied electric and magnetic fields, basic Laser principle and Laser properties
CO2: Classify various Atomic Spectras, Rotational, vibrational, electronic and Raman spectra, atomic effects such as Zeeman effect, stark effect. Different types of laser coupling: JJ and LS coupling
CO3: Describe the Theories explaining the structure of atoms in the origin of observed spectra, atomic spectra of 1 & 2 valence electron atoms, electronic spin and nuclear magnetic resonance
CO4: Deduce threshold condition for laser emission, kinetics of optical absorption, spin orbit interaction, Einstein coefficient
CO5: Analyze Zeeman pattern of D1 and D2 lines of Na atom, discrete set of electronic energies of a molecule
CO6: Apply laser in the field of medicine and industry, understand effects of an electric field on the energy levels of hydrogen atom

Subject: Nuclear Physics (PHY-602)

At the end of the course, students will be able to

CO1: Understand the internal and external properties of atomic nucleus
CO2: Describe interaction of various types of interaction among radiation and matter and their applications
CO3: Evaluate the possibilities of a nuclear decay via α, β or ν-emission
CO4: Learn basic concepts of accelerators and radiation detectors like their design, working principle and applications

CO5: Classify the type of nuclear reactions and conservation laws
CO6: Study the types of nuclear reactors and their possibilities of designing and developing new reactors
CO7: Explain current state of nuclear reactors installed for various applications

Subject: Physics Practical (PHY-603)

At the end of the course, students will be able to

CO1: Understand the basic apparatus like spectrometer, travelling microscope
CO2: Take reading, do calculation and analyze the result obtained for experiments related to optics, electronics and laser physics
CO3: Made aware about precision and error in the measurements
CO4: Co-relate the result of performed practical in daily life and can also seek new applications

Programme Name - B.Sc. (Computer Science)

Programme Outcomes of B.Sc.(Comp. Sc.)

The programme empowers the students to

PO1: Apply mathematical and computing theoritical concepts in solving common computing applications such as computing the order of algorithm

PO2: Develop criteria to organize information efficiently in the form of outline, charts by using appropriate software

PO3: Use the System Analysis Design paradigm to critically analyze problems

PO4: Solve the problems (programming networking database and web design) in the Information Technology environment effectively to teams and accomplish a common goal to demonstrate professional behaviour

PO5: Understand scientific and management principles and apply these to manage projects and in multidiciplinary environments

PO6: Communicate effectively with the scientific community on complex activities like writing effective reports and design documentation, make effective presentations and give and receive clear instructions

Programme Specific Outcomes of B.Sc. (Comp. Sc.)

Students opting for optional paper of computer science in B.Sc. will have additional PSOs:

PSO1: Ability to communicate computer science concepts, data structures, programming languages, databases, computer hardware etc.

PSO2: Apply problem solving skills and the knowledge of computer science to solve real world problems

PSO3: Holistic development of students with the inculcation of moral and social values to help them become better citizens of India

PSO4: Innovative practices would be utilized to bridge the gap between business leaders and computer industry experts.

PSO5: Students would be able to use mathematics through differential and integral calculus, numerical analysis, probability and statistics and its applicability to computer science and engineering

Semester I

Subject: Computer Fundamentals and MS-Office (1.1)

At the end of the course, students will be able to

CO1: Know the basics of computer system, number systems, inter conversion of numbers, coding systems, computer codes

CO2: Understand the different type of input/output devices, memory systems and video standards

CO3: Be familiar with softwares, its types and logic development tools-algorithm, flowcharts

CO4: Get practical learning of MS-Word, Excel and Powerpoint in office automation tools
CO5: Differentiate various types of hardware and softwares and areas of applications

Subject: Computer Architecture (1.2)

At the end of the course, students will be able to

CO1: Learn about basic building blocks and circuit design
CO2: Understand arithmetic circuits and combinational circuits
CO3: Know about sequential circuits
CO4: Familiarize with register transfer and micro-operations
CO5: Know about the computer organization and design

Subject: Practical Lab Work (Computer Fundamentals and MS-Office) (1.3)

At the end of the course, students will be able to

CO1: Create MS-Word documents, designing these documents with bullets, numbering and other Word Art options in MS-Word
CO2: Design MS-Excel sheets using different styles of tables, charts, formulas, functions like mathematical and logical
CO3: Create Powerpoint slides using single and multiple slides, animation and sound effects in it
CO4: Design a file using different tools of MS-Office completely

Semester II
Subject: Programming in 'C' (2.1)

At the end of the course, students will be able to

CO1: Understand the basic concepts of programming and development of efficient programs
CO2: Understand the concept of various data types, symbols, words, operators and expressions used in language
CO3: Learn about decision making, branching and looping statements
CO4: Understand the concept of built-in functions, user defined functions and different techniques used
CO5: Differentiate between arrays and pointers, know about string handling
CO6: Learn about derived data types and file handling

Subject: Structured Systems Analysis and Design (2.2)

At the end of the course, students will be able to

CO1: Learn characteristics of system and its types

CO2: Understand structure analysis and its tools
CO3: Know about the feasibility study and cost-benefit analysis
CO4: Understand system design and form design methodology
CO5: Learn the concept of system testing and quality assurance goals
CO6: Understand system implementation, evaluation, maintenance and documentation

Subject: Programming in C (2.3)

At the end of the course, students will be able to

CO1: Implement the basic concept of C language
CO2: Implement the different operator in C program
CO3: Implement the various Constructs using C language
CO4: Create programs using Arrays, Pointers and String operations in C language
CO5: Implement different file handling functions in C programs

Semester III
Subject: Data Communication and Networking (3.1)

At the end of the course, students will be able to

CO1: Understand the basic concept of networking, network topologies and OSI and TCP/IP model
CO2: Understand analog and digital communication data transmission and its types. Knowledge of transmission media, switching and multiplexing concepts
CO3: Describe communication satellite, dialup networking and analog modem concept
CO4: Learn about data link layer reponsibilities and their implementation like media access control protocol
CO5: Understand the concept datagram, and virtual circuit Routing algorithm and its types and inter networking
CO6: Learn about the elements of transport layer. Understand the different protocols like internet transport protocol, UDP, real time transport protocol also learn about application layer, domain name system, E-mail, www

Subject: Object Oriented Design and C++ (3.2)

At the end of the course, students will be able to

CO1: Learn about object oriented concept and object modeling technique
CO2: Learn about syntax, structure and concepts of C++ data types and classes and objects and also explain data member and member function
CO3: Implement the concept of constructer and destructor. Explain dynamic memory allocation console I/O formatted and unformatted I/O
CO4: Understand the concept of inheritance and polymorphism and classify the difference between overloading and overriding

CO5: Understand the concept of virtual function and virtual class

Subject: Practical Lab Work (3.3)

At the end of the course, students will be able to

CO1: Implement the basic concepts like creation of Class, Objects, Member functions
CO2: Implement concepts like Static data members, Inline functions, Function overloading, Friend functions, etc.
CO3: Create the program implementing the concepts of Construction, Destructors and this Pointer
CO4: Implement the concepts of Formatted and unformatted Input/Output functions
CO5: Create the program implementing the concepts of Inheritance and Polymorphism

Semester IV
Subject: Data Structures with C/C++ (4.1)

At the end of the course, students will be able to

CO1: Understand data structure and its essence
CO2: Learn the array operations
CO3: Implement stack and queue
CO4: Understand linked list and tree structures and their applications
CO5: Learn graph data structure and its implementation
CO6: Implement various sorting and searching algorithms

Subject: Operating System (4.2)

At the end of the course, students will be able to

CO1: Understand about different types of operating system
CO2: Know about process scheduling and algorithm of scheduling. Deadlock prevention and avoidance concept also be cleared by the students
CO3: Describe different memory management technique
CO4: Know about the file management concept and its classification and also be familiar with directory structure and file protection mechanism

Subject: Practical and Viva-Voce (4.3)

At the end of the course, students will be able to

CO1: Implement the various operations applied on array
CO2: Create the program implementing various types of searching and sorting
CO3: Implement the program having stack operations
CO4: Create the program implementing various Queue operations

CO5: Implement various operations of Linked-List

Semester V
Subject: Database Management System (5.1)

At the end of the course, students will be able to

CO1: Understand the concepts of file based approach and database approach
CO2: Describe the database system architecture and various data models
CO3: Describe the entity-relationship model, conceptual design using E-R diagram
CO4: Define and describe the various normal forms of normalization and various types of dependencies applicable on various normal forms
CO5: Define, describe and implement the various SQL queries

Subject: Introduction to Internet and Web Technologies (5.2)

At the end of the course, students will be able to

CO1: Understand internet, internet protocols and internet tools
CO2: Learn about internet security problems and solutions
CO3: Know about search engines and how to surf the net
CO4: Create and publish a web page via HTML language using text formatting font controls and list
CO5: Implement hyperlink on web page
CO6: Understand how to create table and implement graphics in HTML programs

Subject: Practical and Viva-Voce (5.3)

At the end of the course, students will be able to

CO1: Implement interactive web page(s) using HTML
CO2: Design a responsive web pages via using FORMs
CO3: Create a real life application with constraints and keys using SQL
CO4: Retrieve any type of information from a database by formulating queries in SQL

Semester VI
Subject: Visual Basic Programming (6.1)

At the end of the course, students will be able to

CO1: Understand the overview of programming languages (Visual and Non-Visual)
CO2: Understand VB application environment and event driven programming
CO3: Implement selective structures and repetitive structures in VB program using different control statements
CO4: Develop program using procedures, subroutines and functions

CO5: Develop database programs using DAO and ADO

Subject: Software Engineering (6.2)

At the end of the course, students will be able to

CO1: Describe various software life cycle models and goals and principles of software engineering
CO2: Understand various software requirement analysis techniques
CO3: Describe the various components of SRS document and their relevance
CO4: Be familiar with various software project management and configuration management techniques
CO5: Know about the various software design types and principles

Subject: Practical and Viva-Voce (6.3)

At the end of the course, students will be able to

CO1: Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)
CO2: Develop a Graphical User Interface (GUI) based on problem description
CO3: Develop and debug applications using Visual Basic that runs under Windows operating system
CO4: Develop programs that retrieve input from a file as real life application via using FORMs and Database controls

B.Sc.(Med., Non-Med., Comp.Sc.) I
English (Compulsory)
Semester-I
At the end of the course, students will able to

CO1 Know basic english rules with correct use of sentence formation and grammar
CO2 Discuss rules of english translation and english transcriptions
CO3 Understand english poetry focusing mainly on romantic and Victorian poetry
CO4 Write on various topics with fluency in language

B.Sc.(Med., Non-Med., Comp. Sc.) I
English
Semester-II
At the end of the course, students will able to

CO1 To translate well from hindi language to english language
CO2 To learn and write format of precis writing
CO3 To critically analyze poetry of Indian writers of english literature
CO4 Communicate through writing correct format of 'applications/letters'

Hindi

बी॰एस॰सी॰ द्वितीय वर्ष (तृतीय सेमेस्टर) हिन्दी

1. विद्यार्थियों को अर्वाचीन कवियों के जीवन से और उनकी विचारधारा से अवगत कराया जाता है। ये कवि हैं – भारतेन्दु हरिश्चन्द्र, मैथिलीशरण गुप्त, माखनलाल चतुर्वेदी, सूर्यकान्त त्रिपाठी 'निराला', महादेवी वर्मा (कवयित्री), रामधारी सिंह 'दिनकर', हरिवंशराय बच्चन।
2. निर्धारित निबंधों के माध्यम से निबन्ध लिखना सिखाया जाता है।
3. सरकारी पत्र लिखने का तरीका बताया जाता है।
4. वैज्ञानिक शब्दावली सिखाई जाती है।

बी॰एस॰सी॰ द्वितीय वर्ष (चतुर्थ सेमेस्टर) हिन्दी

1. संस्मरणों के माध्यम से रचनाकारों (महादेवी वर्मा, निराला भाई, प्रेमचन्द, प्रसाद, पंत, सुभद्रा कुमारी, रविन्द्रनाथ टैगोर, राष्ट्रपिता गाँधी, राजेन्द्र बाबू, जवाहर भाई, संत राजर्षि) के जीवन से अवगत कराने का प्रयास किया जाता है।
2. निर्धारित निबंध लिखवा कर विद्यार्थियों की लेखन क्षमता को सुधारा जाता है।
3. अर्द्ध–सरकारी पत्र लिखवा कर विद्यार्थियों को पत्र लिखने में कुशल बनाने की कोशिश की जाती है।
4. वैज्ञानिक शब्दावली द्वारा उनके ज्ञान में वृद्धि की जाती है।

Sanskrit

बी॰एस॰सी॰ द्वितीय वर्ष (तृतीय सेमेस्टर) संस्कृत

1. विज्ञान के लिए संस्कृत–विषय की उपयोगिता को देखते हुए संस्कृत–चयनिका में विभिन्न ग्रन्थों से संकलित किये गये पद्य–भाग द्वारा छात्राओं का ज्ञान–वर्धन किया जाता है। जगत् जीव, ईश्वर–स्वरूप की जानकारी श्री राम के गुणों का वर्णन, सद्–आचरण तथा धन की महत्ता से बवगत कराया गया।
2. गद्य–भाग में छात्राओं के लिए अनुशासन–पालन, उचित–दैनिक द्वारा मन व शरीर को स्वस्थ रखने की विधि तथा पञ्चतन्त्र की रोचक कहानियों के माध्यम से बौद्धिक–चातुर्य की जानकारी दी गई है।
3. शब्द–रूप, धातु–रूप तथा सन्धि के माध्यम से संस्कृत व्याकरण का सामान्य ज्ञान दिया जाता है।

बी॰एस॰सी॰ द्वितीय वर्ष (चतुर्थ सेमेस्टर) संस्कृत

1. संस्कृत–चयनिका के पद्य–भाग द्वारा छात्राओं को श्रेष्ठ दण्ड–व्यवस्था से अवगत कराना, एकाग्रचित से बौद्धिक–ज्ञान को बढ़ाना तथा नीति सम्बन्धी ज्ञान से जीवन को सरल बनाया आदि के विषय में बताया गया है।

2. गद्य–भाग में हितोपदेश तथा पञ्चतन्त्र से ली गई कथा छात्राओं के जीवन में आने वाली दिन–प्रतिदिन की समस्याओं का समाधान सिखाती है।
3. शब्द–रूप, धातु–रूप तथा संस्कृत में अनुवाद संस्कृत सम्भाषणं में छात्राओं के लिए सहायक है।

Programme Name - B.Sc.(Home Science)

Programme Outcomes of B.Sc. (Home Science)

The programme empowers the students to

PO1: Understand and appreciate the role of interdisciplinary sciences in the development and well being of individuals, families and communities
PO2: Develop professional skills in food and nutrition, textiles, housing, product making, communication technologies and human development
PO3: Acquire professional and entrepreneurial skills for economic empowerment of self in particular and community in general
PO4: Understand the sciences and technologies that enhance the quality of life of people
PO5: Take science from the laboratory to people
PO6: To have an understanding about the research methodology employed in field of home science

Programme Specific Outcomes of B.Sc. (Home Science)

PSO1: Understand the role of food and nutrition for the welfare of the community
PSO2: Professional competence to take up careers in academics, health care and services industry
PSO3: Apply analytical principles of foods and nutrients in diet formulation
PSO4: Acquire skill in textiles dyeing and printing
PSO5: Apply methods of teaching and training towards administration of early learning centres
PSO6: Exhibit efficient resource use of potentials at home and work
PSO7: Understand scientific principles and techniques of food services management
PSO8: Utilize and manage resources and contribute to community development

Semester-I

English Language and Communication Skills - I (101)

At the end of the course, students will be able to

CO1 Speak with correct pronunciation vocabulary and usage of phonetary system of english language
CO2 Critically analyze english poetry focusing on various issues
CO3 Write applications/letters formally and informally
CO4 Express their feelings and emotions well with correct sentence formation, grammar and communication skills

Subject: Applied Chemistry (102)

At the end of the course, students will be able to

CO1 Differentiate between the concept of element, mixture, compound molecular masses, atomic masses, Bohr's model of an atom, normality, morality and numerical problems based on them

CO2 Describe about concept of acids, bases and salts. Modern periodic law, Periodic table, Electronic configuration of elements, Periodic properties like Atomic size, ionization energy, electron affinity and electro negativity

CO3 Know about carbon and its characteristics, Tetra velancy, catenation, isomerism, tendency to form multiple bonds, organic compound, classification of organic compounds, IUPAC nomenclature of Aliphatic compounds

CO4 Describe about soaps and synthetic detergents, synthetic polymer like PVC, Teflon, PAN, Nylon-6, 6, polyester and chemical composition in cosmetics - creams, perfumes, talcum powder, deodorants, lipsticks, nail polish, shampoo, hair dye. Paints and varnishes (composition and uses)

Subject: Practical (102)

At the end of the course, students will be able to

CO1 Prepare crystals of copper sulphate and potash alum

CO2 Prepare solutions of sodium hydroxide, sodium carbonate and hydrochloric acid

CO3 Determine the normality and strength of given sodium hydroxide solution by volumetric titrations using phenolphthalein as an indicator

CO4 Determine the normality of given HCl solution by titrating it against standard sodium carbonate solution using methyl orange as an indicator

Subject: Human Physiology (103)

At the end of the course, students will be able to

CO1 Understand about cell biology: Animal Cell structure

CO2 Learn about cardiovascular system - Blood and its composition, Blood groups, Coagulation of blood, function of heat, Blood pressure and its regulation

CO3 Learn about Skeletal system - its function, names and number of different bones, joints of skeleton and their names with example

CO4 Get the knowledge about Digestive system - its structure and function of various parts of alimentary canal digestion and absorption of food. Function of liver, Pancreas and Salivary glands

CO5: Learn about Reproductive system, Excretory system, respiratory system - its structure and function

Subject: Human Physiology (Practical) (103)

At the end of the course, students will be able to

CO1 Explain structure of Skeleton system
CO2 Learn about Blood Cells: fresh mount and stained
CO3 Learn how to determine hemoglobin percentage in blood
CO4 Study human system through charts and models
CO5 Measure blood pressure using sphygmomaoter
CO6 Understand about coagulation of blood and blood grouping

Subject: Introductory Clothing (104)

At the end of the course, students will be able to

CO1: Identify the parts and functions of sewing machines and their related problems and the remedies to correct them
CO2: Learn different types of drafting, seams, stitches and its variations and study of anthropometric measurements
CO3: Understand the design, elements and principles of clothing
CO4: Increase their awareness regarding importance of clothing, sociological and psychological aspects of clothing
CO5: Develop an awareness of cultural difference in dress and textile products according to climate, occasion, occupation, fashion and design

Subject: Introductory Clothing (Practical) (104)

At the end of the course, students will be able to

CO1: Understand various garment sewing techniques like Basic stitches, seams and seam finishes, disposal of fullness gathers and plants, placket openings, finishing of necklines, fasteners
CO2: Get awareness on common drafting and stitching of apron with patch pockets, child's panty and bib
CO3: Learn about various Decorative embroidery stitches
CO4: Know how to take body measurements

Subject: Hygiene and Public Wealth (105)

At the end of the course, students will be able to

CO1: Understand the concept of health - its definition, personal hygiene - exercise and its importance
CO2: Get information about communicable diseases
CO3: Provide directions about immunity

CO4: Learn about community water and waste management and importance of water in daily life
CO5: Increase knowledge about infectious diseases like cholera, hepatitis, typhoid, malaria, chicken pox, etc.

Subject: Basic Foods (106)

At the end of the course, students will be able to

CO1: Understand the concept of foods and nutrition
CO2: Know comprehensive knowledge of food pyramid in Indian scenario
CO3: Know the insight of cooking terminology
CO4: Learn the skills of enhancing the nutritive value of foods by applying the knowledge of balanced diet
CO5: Get acquainted with common adulterants of foods and methods to remove them
CO6: Understand about pesticides residues, their ill effects on health and how to make safe food for human consumption

Subject: Basic Foods (Practical) (106)

At the end of the course, students will be able to

CO1: Understand the controlling techniques weights and measures, standard and household measures for raw and cooked foods
CO2: Learn the table setting and table manners
CO3: Learn preparation of minimum two dishes each using common methods of cooking
CO4: Understand how to prepare of food items by fermentation and germination

Semester-II
English Language and Communication Skills - II (201)

At the end of the course, students will be able to

CO1 Critically analyze english poetry focusing on poetry of Russian writers
CO2 Correctly use prefixes and suffixes
CO3 To know correct synonyms and antonyms of english words
CO4 To develop writing skills through theme based paragraph writing
CO5 Learn resume writing, report writing and e-mail writing

Subject: Applied Physics (202)

At the end of the course, students will be able to

CO1 Understand the basic concept of properties of matter i.e. solid, liquid and gas, simple mechanics, friction, sources of electricity, basic electrical circuits, heat, sources and properties of heat
CO2 Distinguish between centrifugal and centripetal forces, transformer and refrigeration, static and current electricity
CO3 Deduce Ohm's law, Law of resistance in series and parallel combination
CO4 Analyze: Thermal - seedback effect, transfer of energy from the powerpoint to home, distribution of current to the house, method of installing the wiring circuits and switches
CO5 Describe/Explain: generator, vacuum cleaner, water heater, geysers, hot plate, water-boiler, steam iron, pressure cooker
CO6 Understand application of heat transfer- household thermometers

Subject: Physics Practical (202)

At the end of the course, students will be able to

CO1 Understand the basic knowledge of screw gauge and vernier callipers
CO2 Deduce the value of 'g' using simple pendulum
CO3 Analyze conductivity by simple method and specific heat of solids
CO4 Verify Ohm's law and the law of resistance in series and parallel combinations

Subject: Human Development - I (203)

At the end of the course, students will be able to

CO1: Get information about the Human Development, its definition, principle of development - factor affecting development
CO2: Know about stage of development, parental development and factor affecting parental development
CO3: Get information about the infancy, its physical characteristics, development task and factor influencing development
CO4: Know about the age group (2-6), its development tasks, and preschool orientation and significance, importance of pay for all round development

Subject: Human Development - I (Practical) (203)

At the end of the course, students will be able to

CO1: Prepare and develop enlist assessment of infants and preschooler
CO2: Able to observe the following stages

a) Infancy (Physical, motor)

b) Preschool (motor, emotional, social, parent child interaction, child-child interaction)

CO3: Able to understand activities for preschoolers

Subject: Introduction to Textiles (204)

At the end of the course, students will be able to

CO1: Understand characteristics of different textiles like cotton, linen, wool, silk
CO2: Learn about manufacturing and properties of natural fiber, man-made and synthetic like rayon, polyester, polyamide and acrylic
CO3: Get acquaintance about basic principles of yarn making and yarn types
CO4: Get information about fabric constructions and fabric blends
CO5: Know about different methods of knitting , knotting, braiding, felting, etc.

Subject: Introduction to Textiles (Practical) (204)

At the end of the course, students will be able to

CO1: Identify fibre through visual inspection microscopic, burning and chemical tests
CO2: Take sample collection for various textiles and weaves
CO3: Learn about the Basic stitches of knitting and following of knitting instructions, making samples
CO4: Learn how to estimate the thread count of fabric

Subject: Applied Botany (205)

At the end of the course, students will be able to

CO1: Know how to grow healthy, fresh food at home by studying kitchen gardening and raising healthy seedlings also
CO2: Become indoor gardening superstars
CO3: Identify important herbal and medicinal plants and their importance
CO4: Know about the components of soil, soil profile and types of soil
CO5: Understand the application of terrace gardening, planning and maintenance of lawns
CO6: Grow plants by vegetative propagation and tissue culture techniques commercially

Subject: Fundamentals of Nutrition (206)

At the end of the course, students will be able to

CO1: Gain comprehensive knowledge of all nutrients
CO2: Increase the awareness regarding nutritional deficiencies like malnutrition kwashiorkor, sucarvey, etc. and how to overcome them

CO3: Understand the importance of water in our daily life
CO4: Know how excess of these nutrients can harm human body

Subject: Fundamentals of Nutrition (Practical) (206)

Students will understand the rich food and learn how to prepare dietary sources of following nutrients:

i. Energy
ii. Protein
iii. Vitamin A
iv. Iron
v. Calcium
vi. Vitamin C
vii. Thiamin
viii. Fibre Rich Dishes

Semester III
Subject: Extension Education and Rural Development (301)

At the end of the course, students will be able to

CO1: Understand the concept of extension education - meaning, principles, philosophy and objectives. Approaches of extension - individual group and man approach, qualities of extension worker, role of extension worker
CO2: Promote the non projected aid - advantages and limitations
CO3: Know about the role of extension education in - agricultural development, home science extension
CO4: Get information about various rural and community development programmes like - IRDP, NERP, ICDS, TRYSEM, ANP, SNP
CO5: Understand the programme planning - definition, meaning of programme planning, steps in programme planning
CO6: Learn about role of voluntary organization in rural development, role of home science in solving rural problems of illiteracy, poverty and poor health

Subject: Extension Education and Rural Development (Practical) (301)

At the end of the course, students will be able to

CO1: Indulge in preparation of non projector aids-chart, posters, leaflets, pamphlets, mobile, flash card
CO2: Understand the preparation of Puppets as a media of communication, writing stories for puppets
CO3: Gain firsthand experience after planning visit to any village to see government and voluntary organization in action

Subject: Human Development - II (302)

At the end of the course, students will be able to

CO1: Understand about late childhood: its development task, physical, motor and social development, school significance and functions, effect of success and failure, peer group, its importance and function
CO2: Learn about Early adolescence: its definition, puberty growth, primary and secondary sexual characteristics, period of storm and stress, early and late mature, parent child conflict
CO3: Get the knowledge about late adolescence: its characteristics, physical, emotional, cognitive development. conflict with authority, choosing a career and factors influencing it
CO4: Learn about adolescent problems - Drug and alcohol abuse, psychological break down, STD, AIDS, teenage pregnancy and other behaviour maladjustments

Subject: Human Development - II (Practical) (302)

At the end of the course, students will be able to

CO1: Learn observing a child and adolescent for different development stages
CO2: To study the problems of adolescents, peer interactions and parent child relationship
CO3: Learn preparing play material and craft activities for middle and late childhood

Subject: Psychology - I (303)

At the end of the course, students will be able to

CO1: Know more about Psychology, its background subject matter
CO2: Understand the relationship between Psychology and Home Science
CO3: Know more about the methods of Psychology
CO4: Know more about the perception, emotions and motivation concept, attention
CO5: Learn about sensation and its sensory organs as eye, ear, nose, skin, tongue etc.
CO6: Practically perform all the activities in relation to Home Science

Subject: Introduction to Home Management - I (304)

At the end of the course, students will be able to

CO1: Get information about management in definition, concept, management process
CO2: Know about the decision making, its types, steps and factors affecting decision
CO3: Get information about family life cycle
CO4: Know about the motivating management, its values, goals standards
CO5: Get information about the family resources, its classification, factors affecting use of resources, similarities among resources

Subject: Laundry Science and Finishing Fabrics (305)

At the end of the course, students will be able to

CO1: Learn the basics of fabric finishes like physical finishing, chemical finishing and special purpose finishes
CO2: Understand the classification of dyes like natural dyes, direct, acid, basic and synthetic dyes
CO3: Get information styles of printing and methods of printing
CO4: Know about laundering, its equipments and care of fabrics like cotton, silk, woolen and synthetics
CO5: Learn about classification of stains and methods of removing different types of stains

Subject: Laundry Science and Finishing Fabrics (Practical) (305)

At the end of the course, students will be able to

CO1: Learn about different methods of Stain removal
CO2: Prepare sample and article household dyeing and Tie and dye
CO3: Prepare sample and article Block printing and stencil printing
CO4: Learn about washing and finishing of cotton, silk and woolen garments

Subject: Consumer Economics (306)

At the end of the course, students will be able to

CO1: Able to understand the basics of economics nature, scope importance of economics
CO2: Able to know the concept of demand, supply and consumer equilibrium and laws for consumers
CO3: Know about the role of consumers and their buying motives, their awareness about their rights
CO4: Understand their rights against faulty practices prevailing in the market
CO5: Know the role of media and advertisements and its relationships with economics

Subject: Food Science - I (307)

At the end of the course, students will be able to

CO1: Know the basic concept of food science i.e. study of physical, biological and chemical makeup of food, food and application of this knowledge in different fields
CO2: Enlighten themselves with knowledge of food technology, biofortification, nutroceuticals, organic foods, space foods, packaging of foods, etc.
CO3: Understand the basic food groups like cereals, pulses, fats and oils, milk, milk products and sugar, etc.

CO4: Gain further the comprehensive knowledge of food groups like composition and nutritive value, processing and storage

Subject: Food Science - I (Practical) (307)

Students will be able to understand how to prepare, serve and evaluate the following

1. Beverages
2. Breakfast Cereals
3. Fermented Cereal, cereal preparations - Curd Rice, Lemon Rice
4. Recipes of Pulses
5. Preparation of milk and milk products, Snacks and Desserts
6. Ice Creams
7. Cakes and Biscuits
8. Sandwiches
9. Chikkis

Semester IV
Subject: Community Development and Communication (401)

At the end of the course, students will be able to

CO1: Increase their knowledge about communication - meaning, scope and importance of communication, elements of communication, problems of communication with special reference to India, Models of communication and various types of communication
CO2: Promote the classification of teaching methods according to form and use
CO3: Strengthen the scope, advantages and limitations of different extension methods
CO4: Provide the directions of Panchayati Raj system - meaning function, organizational set up, problems and principles of democratic decentralization
CO5: Understand the classification of audio - visual aids - different aids, their scope, advantages and limitation factor limiting the selection and use of audio-visual aids
CO6: Know about the use of radio talks, television, personal talk, conference, tours, campaigns, village fair

Subject: Community Development and Communication (Practical) (401)

At the end of the course, students will be able to

CO1: Make the non-projected aids to educate rural women of different aspects of Community Development
CO2: Preparation of projected aids - Transparency and powerpoint presentation
CO3: Learn how to use puppet as a media of communication
CO4: Understand how to get prepared to give a radio talk

Subject: Human Development - III (402)

At the end of the course, students will be able to

CO1: Get information about the young adulthood, its definition, development tasks, significance of the period, responsibilities and adjustment, new family, workplace, parenthood, independence, financial matters
CO2: Get information about sex role issues and implication for young adults
CO3: Increase their knowledge about middle adulthood, its definition, physical changes (senses and diseases) menopause, health issues, stresses in middle age, coping with stress at family and workplace, occupation and job satisfaction, preparation for retirement
CO4: Get information about late adulthood, its definition, development task of old age, common interest in old age, psychological change, health problems, cognitive and memory change
CO5: Know about the retirement - effect on self, family, society, identity and friendship and problems of old age

Subject: Psychology - II (403)

At the end of the course, students will be able to

CO1: Learn about the Learning, Intelligence, Thinking, Reasoning and Imagination
CO2: Know more about the effect of motivation on learning
CO3: Know more about the Personality types and assessment of Personality
CO4: Know more about the biological and social influencing factors of Personality
CO5: Learn more about memory and understand types of memory and remembering the facts
CO6: Able to analyze the major factors of forgetting and about the theories
CO7: Able to gain practical knowledge about learning and memory aspects

Subject: Institutional Food Management (404)

At the end of the course, students will be able to

CO1: Analyze the scope of catering
CO2: Know comprehensive knowledge of kitchen spaces, storage spaces and service areas besides lighting, ventilation, location of these spaces
CO3: Promote use of creative menus in different commercial set ups
CO4: Understand the concept of food cost control and methods of pricing the food products

Subject: Garment Construction and Apparel Science (405)

At the end of the course, students will be able to

CO1: Express the social and psychological reasons for fashion changes, fashion cycle and forecasting
CO2: Learn the pattern making and construction of various types of garments
CO3: Know about selection of garments for different age group like infants, toddlers, preschool, school going children, teenagers, adults and old age people
CO4: Know how to select household linen, curtains, draperies and towels
CO5: Get information regarding selection of readymade garments

Subject: Garment Construction and Apparel Science (Practical) (405)

At the end of the course, students will be able to

CO1: Prepare Drafting of child's body block with collars, construction of 'A' line or a frock with gathers
CO2: Prepare drafting and stitching of Salwar and Kameej
CO3: Prepare Drafting and Stitching of petticoat

Subject: Introduction to Home Management - II (406)

At the end of the course, students will be able to

CO1: Get information about the ergonomics in home
CO2: Know about the work simplification
CO3: Get information about financial management and income, budget types, steps in making budget
CO4: Know about credit - its use, types of credit, problems in credit. Taxation and basic calculation of Income Tax
CO5: Know about art, elements of art, colour and their classification, colour scheme, factors influencing choice of colours in decoration

Subject: Home Management - II (Practical) (406)

At the end of the course, students will be able to

CO1: Learn making budget for LIG, MIG, HIG
CO2: Frame charts for time and energy management
CO3: Understand calculating income tax
CO4: Plan how to make color wheel and color schemes
CO5: Learn Floor decoration - Alpana and Rangoli

Subject: Food Science - II (407)

At the end of the course, students will be able to

CO1: Strengthen the techniques of evaluation of food quality by sensory evaluation, objective evaluation
CO2: Enhance the knowledge of raising and leavening agents in cookery and bakery
CO3: Promote ripening of fruits by process of enzymatic browning
CO4: Understand the detailed knowledge of food groups like vegetables and fruits, fresh foods and spices and condiments, etc.

Subject: Food Science - II (Practical) (407)

At the end of the course, students will be able to

CO1: Know how to prepare Jam, Jelly, Chutney, Pickles, Marmalades, Murabbas
CO2: Understand the importance of visit to a food industry and writing a report

Semester V
Subject: Family Dynamics (501)

At the end of the course, students will be able to

CO1: Understand about marriage: its need and goals, criteria for successful marriage, adjustment in marriage, Inter-caste and inter religious marriage
CO2: Learn about family, functions of family and family life cycle stages
CO3: Know about single parent family, DINK family, families with adopted children
CO4: Get the knowledge about internal relation with in the family. Individual roles, rights and responsibilities within the family

Subject: Child Care and Rearing Practices (502)

At the end of the course, students will be able to

CO1: Frame preparing interesting activity list for children below 5 years
CO2: Learn preparation of the immunization chart
CO3: Able to study feeding patterns of different income group children using observation method
CO4: Know the awareness level of pregnant women (educated and illiterate) using interview method
CO5: Make soft toys

Subject: Child Care and Rearing Practices (Practical) (502)

At the end of the course, students will able to

CO1: Get information about the pregnancy, types and stages of delivery and care of the new born
CO2: Get information about the weaning and supplementary food
CO3: Know about the sleep routine, toilet training, role of mother in training of the infant
CO4: Get information about the problems and remedies - regarding feeding, sleep disorder, excessive fear, speech problem

Subject: Nutritional Biochemistry - I (503)

At the end of the course, students will able to

CO1: Understand definition, objectives, inter-relationship between biochemistry and other biological sciences
CO2: Describe definition, classification of enzymes, types of coenzymes, specificity, factors affecting enzyme activity, enzyme kinetics, cofactors and enzyme inhibition
CO3: Explain biochemical roles of Vitamin A, D, E, K, B_1, B_2, B_3, B_6 and Vitamin C
CO4: Describe definition, classification, structure and properties of monosaccharides (glucose, fructose and sucrose), disaccharides (maltose, lactose and sucrose), polysaccharides (starch, glycogen), complete cycle and structures of glycolysis, gluconeogenesis, gycogenisis, glysogenolysis
CO5: Describe definition, classification, structure and properties of proteins, amino acids and their types and structure, general reactions of amino acids metabolism (transamino oxidative deamination, decarboxylation), urea cycle (complete structure with cycle)

Subject: Nutritional Biochemistry (Practical) (503)

At the end of the course, students will be able to

CO1: Identify monosaccharides, disaccharides and polysaccharides
CO2: Know about how to distinguish carbohydrates by doing Barfoed's Test. Fehling Solution Test, Cobalt Nitrate Test, Iodine Test
CO3: Determine the strength of given sample of Glucose by using Fehling Solution method
CO4: Identify amino acids by using circular paper chromatography

Subject: Community Nutrition (504)

Students shall be able to assess the nutritional status of subjects by following Practicals

CO1: Visit to an institution having mid day meal scheme and writing a report
CO2: Dietary survey of at least 5 subjects using questionnaire and 24-recall method

CO3: Taking anthropometric measurements of at least two subjects
CO4: Clinical examination of two malnourished pre-school children
CO5: Visit to a community kitchen and writing a report

Subject: Indian Textiles (505)

At the end of the course, students will be able to

CO1: Get information regarding basic knowledge of wool of Kashmir
CO2: Know various Indian Traditional textiles
CO3: Understand and highlight the traditional embroideries of India
CO4: Learn different types of painting like batik, hand painting, kalamkari, etc.
CO5: Know methods of printing techniques like block, screen, roller. resist dying and printing

Subject: Indian Textiles (Practical) (505)

At the end of the course, students will be able to

CO1: Prepare the samples of traditional embroideries
CO2: Prepare a portfolio of development of designs in traditional textiles
CO3: Visit museums, craft centres, exhibitions and craft melas

Subject: Interior Space Designing (506)

At the end of the course, students will be able to

CO1: Increase their knowledge about housing and space management, selection of site, orientation, soil, locality, sanitation facilities
CO2: Learn about principles of planning of room - grouping of rooms, circulation, flexibility, privacy, spaciousness, ventilation
CO3: Understand the principles of economic design - economy in plot, economy in planning, construction and calculating cost of construction
CO4: Provide directions about building material for construction stone, brick, cement
CO5: Know about principles of kitchen planning - orientation location, size and shape, ventilation and socio economic status of the family
CO6: Promote the knowledge about types of kitchen
CO7: Learn about selection of equipment and factor affecting it and care and maintenance of household equipments

Subject: Interior Space Designing (Practical) (506)

At the end of the course, students will be able to

CO1: Learn drawing house plan for LIG, MIG, HIG

CO2: Learn the planning of furniture arrangement and color schemes for different rooms
CO3: Understand cleaning and care of metals, glass and upholstery
CO4: Understand care and maintenance of equipments - washing machine, vacuum cleaner, refrigerator, microwave oven, iron, toaster, cooking range

Subject: Normal Nutrition (507)

At the end of the course, students will be able to

CO1: Correlate health nutrition and disease in an effective way
CO2: Enhance their knowledge regarding energy requirement factor affecting like BMR, activity, age, SDA, etc.
CO3: Grasp the concept of meal planning and how nutritional socio cultural, religious, geographic factor affect the meal planning broadly
CO4: Promote the nutritional requirements for different age groups like pregnancy lactation, infancy, childhood, adolescence and adulthood

Subject: Normal Nutrition (Practical) (507)

Students shall be able to plan, prepare and evaluate the diet for different age groups at different activities and socio economic levels like -
Planning preparation of diets for adult

- Pregnant women
- Lactating mother
- Elderly person
- Infancy
- Pre-school child
- School going child
- Adolescent
- Old age

Semester VI
Subject: Women Empowerment (601)

At the end of the course, students will be able to

CO1: Get knowledge of the status of Indian women-pre and post independence. a) legal b) social c) economical d) political e) educational status
CO2: Learn about contemporary problems and issues related to women like families marital disharmony, violence, abuse and dowry victimization of women, sexual discrimination and exploitation of Indian women
CO3: Know about the empowerment of women
CO4: Study social welfare programme and their impact

Subject: Child Welfare (602)

At the end of the course, students will be able to

CO1: Get information about child welfare, its definition, objectives, philosophy, national policy of child welfare
CO2: Know about the problems of school dropouts, problem of child labour, effect of mass media on children, deprivation among children
CO3: Get information about the children with special needs, their rehabilitation and care
CO4: Know about the voluntary and international agencies working for child welfare, family planning programme in India. Children with special needs, their rehabilitation and care

Subject: Child Welfare (Practical) (602)

At the end of the course, students will be able to

CO1: Visit nursery school, creches and bal bhawan
CO2: Visit to the institute for children with special needs
CO3: Prepare play material and toys for children from 4-6 years old
CO4: Make a resource file regarding child welfare
CO5: Survey to know deprivation of girls in different income groups

Subject: Nutritional Biochemistry - II (603)

At the end of the course, students will be able to

CO1: Explain definition, classification of lipids, properties of fatty acids (acid value, iodine value and saponification value)
CO2: Describe beta oxidation and biosynthesis of fatty acids (ketone body formation, ketosis, fatty livers)
CO3: Understand biological oxidation - TCA cycle, ETC, oxidation phosphorylation theories
CO4: Explain nucleic acids, types, composition, replication, transcription, genetic code - structure of DNA and RNA

Subject: Nutritional Biochemistry (Practical) (603)

At the end of the course, students will be able to

CO1: Study properties of amino acids phenylalanine, tyrosine, arginine, ccysteine, tryptophan by doing ninhydrin test, million's test, sakaguchi test, hopkin's cole test, lead acetate test, xanthoproteic test
CO2: Know about acid value of fats and oil
CO3: Determine the saponification value of fats and oil

Subject: Food Microbiology (604)

At the end of the course, students will be able to

CO1: Recall history and evaluation of food microbiology
CO2: Explain molecular approaches of food microbiology
CO3: Characteristics prokaryotic and eukaryotic cells
CO4: Distinguish fungi and protozoa
CO5: Analyze measure food born infections and their intoxications
CO6: Discuss Amphi-catobolic pathways
CO7: Discriminate between physical, chemical and chemotherapeutic agents
CO8: Illustrate industrial uses of bacteria

Subject: Apparel Designing (605)

At the end of the course, students will be able to

CO1: Learn about line and farm : Geometric, Simplified, Naturalized and Abstract
Colour: Colour wheel, grey scale and value scale, colour harmonies and colour rays
Creating design: Development of matif, placement for all over patterns
Matif enlarging and reducing
CO2: Prepare a sample and article through Batik on Cotton fabric
CO3: Prepare articles using various using techniques of applied design
one household article
one apparel

Subject: Apparel Designing (Practical) (605)

At the end of the course, students will be able to

CO1: Understand the comprehensive knowledge of components of design and its types along with the areas to use them
CO2: Recall principles of design, its types on garment designs and create new variations
CO3: Know the colour, its science, classification, meaning and significance along with the theories
CO4: Develop new textile designing patterns based on creation of motifs
CO5: Apply the design concepts for specific body figure

Subject: Interior Designing (606)

At the end of the course, students will be able to

CO1: Increase their knowledge about furniture arrangement, selection and their types
CO2: Understand the types of lighting suitable for different areas of the house

CO3: Provide their directions about various types of accessories and their place in interior decoration
CO4: Know about window treatment draping fabrics and hanging of curtains
CO5: Promote the knowledge of wall finishes and floor treatment
CO6: Get information about design - principles of design and flower arrangement, types of flower arrangement and use of principles of design in flower arrangement

Semester VI: Interior Designing (Practical) (606)

At the end of the course, students will be able to

CO1: Understand about flower arrangement for different areas in house
CO2: Prepare a decorative pot
CO3: Making samples of different types of curtains
CO4: Prepare decorative candles, utility article, gift wrapping, greeting cards with using of various types of material

Subject: Therapeutic Nutrition (607)

At the end of the course, students will be able to

CO1: Understand the concept of principles of Therapeutic nutrition
CO2: Have comprehensive knowledge GI tract disorders, fevers, diabetes mellitus, hypertension and kidney disorder, etc.
CO3: Learn accurate skills of planning the meals for above disease
CO4: Apply the therapeutic changes in normal meal planning

Subject: Therapeutic Nutrition (Practical) (607)

Students shall be able to plan and prepare diets in the following disease conditions and prescribing modifications:

a) Composition
b) Diarrhea
c) Fever-Typhoid
d) Hypertension
e) Diabetes Mellitus
f) Obesity

Programme Name - B.Sc.(Biotechnology)

Programme Outcomes of B.Sc.(Biotechnology)

PO1: After completing B.Sc.(Biotechnology), students will be able to gain knowledge of fundamental rights, immunology, molecular biology, recombinant DNA technology
PO2: Biotechnology will open abundant scopes in the utmost fields of pharmaceuticals and industrial area
PO3: Students will be able to apply ethical principles and develop communication skills through powerpoint presentations
PO4: Students will be able to demonstrate progressive learning of various scientific techniques and methodologies of everyday life sciences
PO5: Students will be able to learn handling of scientific data with the help of statistical tools on computers
PO6: Course prepares the students to understand the Bioethics and ethical issues against the molecular technologies

Programme Specific Outcomes of B.Sc.(Biotechnology)

PSO1: This course would prepare the students for various biostatistical techniques that are used in sequence alignments of genes and proteins
PSO2: This course would help the students to understand the methods of isolation of micro organisms and learn their industrial use
PSO3: Course prepare the student to understand the various techniques of gene transfer methods in plants and animals
PSO4: Gain knowledge of Bioinformatic tools in various disease and molecular analysis
PSO5: Course help the students in understanding the cell, compartmentalization and components of biological membrane
PSO6: Students will be able to apprehend the detailed mechanism of DNA, RNA and nucleic acids
PSO7: Course prepare the students to understand the molecules that mediate cell adhesion and regulation of receptor expression and function

Semester-I
Subject: English (BT-101)

At the end of the course, students will be able to

CO1 Know basic english rules with correct use of sentence formation and grammar
CO2 Discuss rules of english translations and english transcriptions
CO3 Discuss english poetry focusing mainly on romantic and Victorian poetry
CO4 To write paragraph on coherent points

Subject: Plant Diversity I and Bioprospecting (BT-102)

At the end of the course, students will be able to

CO1: Describe the general character and classification of Oedogonium
CO2: Discuss general character and classification of Rhodophyceae
CO3: Explain mucor
CO4: Deduce economic importance of Agaricus
CO5: Define rust and smut of wheat
CO6: Illustrate causal organism and symptoms of late blight of potato and red rot of sugarcane
CO7: List out the main difference between Marchantia and funaria

Subject: Cell Biology (BT-103)

At the end of the course, students will be able to

CO1: Classify the cell structure of organism
CO2: Describe the fluid mosaic model of organisms
CO3: List out the functions of micro tubules and micro filaments
CO4: Draw a well labeled diagram of endoplasmic reticulum and Golgi complex
CO5: Differentiate between lysosmes and ribosomes
CO6: Explain the regulation of nucleus and cell cycle
CO7: Illustrate the regulation of receptor expression and function in extra cellular matrix
CO8: Analyze the promoting agent of carcinogenesis

Subject: Biochemistry and Metabolism (BT-104)

At the end of the course, students will be able to

CO1: Explain different types of proteins along with their classification
CO2: Define homo and hetero polysaccharides
CO3: Discuss the properties of fatty acids
CO4: Differentiate between phospholipids and glycolipids
Co5: Describe physical and chemical properties of nucleic acids
CO6: Discriminate between A, B and Z forms of DNA
CO7: Classify enzymes using their nomenclature
CO8: Illustrate common features of active sites of enzymes

Subject: Physical Chemistry (BT-105)

At the end of the course, students will be able to

CO1: Explain the distribution of different types of velocities on the basis of Maxwell's distribution, give the idea about collision number and diameter, deviation of real gases from ideal behavior, behavior of real gases using Vander Waal's Equation.

CO2: Illustrate the critical phenomenon on the basis of critical compressibility factor, PV isotherms and law of corresponding states

CO3: Distinguish between solid, liquid and gaseous states of matter by using properties and phenomenon like surface tension, viscosity, optical rotation, symmetry element, Bragg's Equation, Bravais lattice and critical phenomenon

Subject: Inorganic Chemistry (BT-106)

At the end of the course, students will be able to

CO1: Understand the ideas of de Broglie matter waves, Heisenberg uncertainty principle, shapes of atomic orbitals, quantum numbers, radial and angular wave functions, and probability distribution curves.

CO2: Explain Aufbau and Pauli exclusion principles, Hund's multiplicity rule, electronic configuration of elements, effective nuclear charge and slater rules, atomic and ionic radii, ionization energy, electron affinity and electro negativity, definition, methods of determination or evaluation, trends in periodic table

CO3: Describe valance bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization to explain the shape of simple inorganic molecules and ions (BeF_2, BF_3, CH_4, PF_5, SF_6, IF_7, SO_4^{2-}, ClO_4^-). VSEPR theory to NH_3, H_3O^+, SF_4, ClF_3, ICl_2^- and H_2O and MO theory of heteronuclear (CO and NO) diatomic molecules, bond strength and bond energy, percentage ionic character from dipole moment and electro negativity difference.

CO4: Know about ionic structures (NaCl, CsCl, ZnS (Zinc Blende), CaF_2), radius ration effect and coordination number, limitation of radius ration rule, Lattice defects, semiconductors, Lattice energy and Born-Haber cycle. Solvation energy and its relation with solubility of ionic solids, polarizing power and polarisabilty of ions, Fajan's rule.

Subject: Organic Chemistry (BT-107)

At the end of the course, students will be able to

CO1: Describe the resonance effect, hyper conjugation, inductive effect.

CO2: Illustrate concept of isomerism, types of isomerism, optical isomerism, elements of symmetry, molecular chirality, enantiomers, optical activity, chiral and achiral molecules with two stereogenic centres, meso compounds, retention and racemization, localized and delocalized chemical bond.

CO3: Know about R & S system, geometric isomerism, E & Z system, conformational isomerism.
CO4: Differentiate between Hetorolytic and Homolytic chemical bond breaking, electrophiles and nucleophiles, carbocation, carbonion, free radical.

Subject: Practical (BT-105-107)

At the end of the course, students will be able to

CO1: Describe Redox Titrations, complexometric titerations
CO2: Illustrate iodometric titerations
CO3: Study the process of sublimation of camphor and phthalic acid

Subject: Practical (BT-109)

At the end of the course, students will be able to

CO1: Develop the skills of microscope handling
CO2: Generate the skills of analyzing various practical chemicals like carbohydrates, proteins, fats, nucleic acid
CO3: Differentiate and classify various specimens of plant kingdom

Semester II
Subject: Biostatistics (BT-201)

At the end of the course, students will be able to

CO1: Illustrate different types of data
CO2: Classify statistical data
CO3: Explain analysis of variance (ANOVA)
CO4: Discuss measures of kustosis
CO5: Discriminate between t-test and chi-square test
CO6: Deduce problems on test of significance
CO7: List out methods of sampling

Subject: Micro Biology (BT-202)

At the end of the course, students will be able to

CO1: Recall history and evaluation of micro biology
CO2: Explain molecular approaches of micro biology
CO3: Characterize prokaryotic and eukaryotic cells
CO4: Distinguish between fungi and protozoa
CO5: Analyze measure food born infections and their intoxications
CO6: Discuss Amphi-Catabolic pathways

CO7: Discriminate between physical, chemical and chemo-therapeutic agents
CO8: Illustrate industrial uses of bacteria

Subject: Genetics (BT-203)

At the end of the course, students will be able to

CO1: Explain the cell cycle of mitosis and meiosis
CO2: Describe the mendel's experimental design for pea plant
CO3: Define the terms dominance, co-dominance, pseudo allele and lethal gene
CO4: Illustrate the non-allelic interactions
CO5: Understand the comparison between chromosome and genomic organization
CO6: Classify the sex determination and sex linkage
CO7: Summarize the extra chromosomal inheritance
CO8: Analyze the evolution and population genetics

Subject: Animal - Diversity Economic Zoology (BT-204)

At the end of the course, students will be able to

CO1: Define coelomata and acoelomata
CO2: Describe the general features and classification of non-chordates
CO3: Discuss general feature and life cycle of malarial parasite in details
CO4: Explain in detail canal system in porifera
CO5: Illustrate polymorphism and its types
CO6: Classify insect and describe the role of various insects as disease vectors
CO7: Explain metamorphosis in insects
CO8: Deduce general features and classification of echinodermata

Subject: Physical Chemistry (BT-205)

At the end of the course, students will be able to

CO1: Understand rate of chemical reaction, factors, order of a reaction and their determination method
CO2: Describe Arrhenius equation, theories of reaction rate and transition state
CO3: Explain electrolytic conduction, factors, arrhenius theory Ostwald's dilution, transport number and determination by Hittorfs methods
CO4: Describe Kohlarausch's Law, their application, application of conductivity measurements, conductometric titeration, Buffer solution and Buffer mechanism

Subject: Organic Chemistry (BT-206)

At the end of the course, students will be able to

CO1: Describe mechanism of dehydration of alcohols, dehydro halogenation of alkyl helides, hofmann elimination 1, 2 and 1, 4 addition, diels-alder RX^n.
CO2: Illustrate relative stability of alkenes, aromatic compounds, friedel-oraft RX^n, enegy profile diagram, activating and deactivating substituent and orientation
CO3: Know about saytzeff rule, marxawni Koff's rule, hydrogenation, hydroboration-oxidation, oxymercuration, ozonolysis, hydration, hydroxylation and oxidation with $KmnO_4$.
CO4: Differentiate between aromatic, anti-arometic, non-aeromatic, SN1 and SN2 RX^n, alkyl halides, alkyl, vinyl, aryl helides.

Subject: Inorganic Chemistry (BT-207)

At the end of the course, students will be able to

CO1: Understand definition, types, effects of hydrogen bonding on properties of substances, application and brief discussion of various types of Vander Waals forces, brief introduction to metallic bond, band theory of metallic bond, semiconductors - introduction, types of applications
CO2: Explain the comparative study of the elements including, diagonal relationships, salient features of hydrides, solvation and complexation tendencies including their function in biosystems, chemical properties of the noble gases with emphasis on their low chemical reactivity, chemistry of xenon, structure and bonding of fluorides, oxides and oxy fluorides of xenon.
CO3: Emphasize on comparative study of properties of p-block elements, describe properties and structure of diborne, properties of borazene and structure trihalides of boron, trends in Lewis acid character of $AlCl_3$, explain catenation, $P\pi$ - $d\pi$ bonding, carbides, fluorocarbons, silicates, silicons-general methods of preparations, properties and uses.
CO4: Describe structures of oxides of N, P, structure and relative acid strengths of oxy acids of nitrogen and phosphorus, structure of white, yellow and red phosphorus, explain oxy acids of sulpher-structures and acidic strength H2O2 - structure, properties and uses, explain basic properties of halogen, interhalogens types properties, hydro and oxy acids of chlorine - structure and comparison of acid strength

Subject: (BT-208)

At the end of the course, students will be able to

CO1: Learn the skills to search and explore different topics in seminar related to Biostatics, Microbiology, genetics and Animal diversity

Subject: Practical (BT-209)

At the end of the course, students will be able to

CO1: Know about paper chrometography
CO2: Describe specific refractivity, viscosity, surface tension
CO3: Synthesize m-dinitrobenzene, iodoform

Subject: Lab Course-II (BT-201-204)

At the end of the course, students will be able to

CO1: Present the data in a graphical and statistical
CO2: Analyze isolation and elaboration of micro organisms
CO3: Learn different principles of genetics through practical demonstration
CO4: Classify and identify various specimens of Animal Kingdom

Semester III
Subject: Medical Microbiology (BT-301)

At the end of the course, students will be able to

CO1: Explain measures of chemotherapy caused by No gonorrhoea (Gram-Negative bacteria)
CO2: Compare carriers of nosocomial infections and septic shock
CO3: Enlist symptoms of gram positive bacteria
CO4: Discriminate between Herpes virus and papova virus
CO5: Conclude amoebiasis along with example
CO6: Illustrate blood-borne infection-malaria
CO7: Put in to lists subcutaneous-infections
CO8: Define pox virus

Subject: Bioanalytical Tools (BT-302)

At the end of the course, students will be able to

CO1: Define simple microscopy and phase contrast microscopy
CO2: Differentiate between TEM and SEM
CO3: Explain the laws and principle of absorption fluorimetry
CO4: Identify the spectrometer and centrifuge instruments
CO5: Describe the principle of chromatography
CO6: Classify the chromatography into various types
CO7: Illustrate the process of SDS-PAGE
CO8: List out the applications of Nano-technology

Subject: Plant Physiology (BT-303)

At the end of the course, students will be able to

CO1: Enhance the knowledge about shoot and root apical meristem
CO2: Differentiate between simple and complex permanent tissue
CO3: Learn the importance of water to plant life
CO4: Describe the mechanism of opening and closing of stomata
CO5: Explain the concept of photo system
CO6: List out the various growth hormones and their physiological roles
CO7: Illustrate the mechanism of seed dormancy

Subject: Plant Diversity (BT-304)

At the end of the course, students will be able to

CO1: List out the general characters of pteridophytes
CO2: Sketch the life history of rhynia
CO3: Illustrate special features of equisetum
CO4: Deduce theories of fossil formation
CO5: Relate life history of lycopodium and pteris
CO6: Describe economical importance of Gymnosperms
CO7: Inspect telome concept
CO8: Point out key points of geological time scale

Subject: Physical Chemistry (BT-305)

At the end of the course, students will be able to

CO1: Describe the thermodynamic terms, process, concept of heat and work, Zeroth law of thermodynamics, laws of thermodynamics, Joule thomson coefficient
CO2: Explain calculation of w, q, du and dH for the expansion of ideal gas under isothermal and adiabatic conditions for reversible process, bond energies and their application
CO3: Understand chemical equilibrium, thermodynamic derivation, Van't Hoff reaction Isotherm and Isochore, Le-Chatelier;s Principle and its application, Clausius-Clapeyron Equation
CO4: Explain Nernst distribution law, modification of distribution law, application of distribution law

Subject: Organic Chemistry (BT-306)

At the end of the course, students will be able to

CO1: Describe methods of formation of alcohols, expoxide, phenols

CO2: Illustrate oxidative cleavage, pinacol-pinecolone rearrangement, ring opening of epoxide, reimer-tiemann RX^n , kolbe's reaction
CO3: Know about schotten-baumen RX^n, hydrogen bonding, acidic nature, orientation of epoxide wing opening, molar absoptivity, effect of conjugation, chromophore, auxochrome
CO4: Differentiate between bathochromic, hyperchromic and hyperchromic shift

Subject: Inorganic Chemistry (BT-307)

At the end of the course, students will be able to

CO1: Understand transition metals, properties and structure of compounds of transition metal - TiO^2, $VoCl^2$, $FeCl^3$, $CuCl^2$, and $Ni(Co)^4$
CO2: Describe transition elements of 2nd and 3rd series spectral and stereochemistry
CO3: Explain coordination compounds, EAN rule, nomenclature and valance bond theory of transition metal complexes
CO4: Describe properties of solvent, general characteristics, reaction in non-aqueous solvent

Subject: Practical (BT-308)

At the end of the course, students will be able to

CO1: Describe CST of phenol-water system enthalpy of ionisation of week acid/week base
CO2: Verify beer-lambert law for $KmnO^4$ / $K^2Cr^2O^7$
CO3: Prepare cuporus chloride, prssion blue, tetramine cupric sulphate, chrome alum, potassium - trioalato - chromate - III

Subject: Lab Course-II (BT-309) (BT-301 to BT-304)

At the end of the course, students will be able to

CO1: Identify the various micro-organisms
CO2: Develop the skills of handling the various instruments i.e. Gel electrophoresis, centrifugation, chromatography
CO3: Prepare the stained mount of anatomy of monocot and dicot's root, stem and leaf
CO4: Demonstrate the opening and closing of stomata
CO5: Classify the morphology and anatomy of vegetative and reproductive parts of pteridophyte and gymnosperms

Semester IV
Subject: Animal Diversity-II (BT-401)

At the end of the course, students will be able to

CO1: Define origin of chordates
CO2: Discuss general character of protochorolates along with its classification
CO3: Explain parental care in amphibia
CO4: Describe origin and flight adaptation in Aves
CO5: Give comparative anatomy of various system (Intequmentary, respiratory, urinoqenital) of vertebrates
CO6: Deduce Autonomic nervous system in mammals
CO7: Illustrate parasympathetic nervous system related to sympathetic nervous system

Subject: Molecular Biology (BT-402)

At the end of the course, students will be able to

CO1: Practice a well labeled diagram of DNA structure and type of DNA
CO2: Define the replication and replication complex
CO3: Describe the process of DNA damage and repair
CO4: Illustrate the model and mechanism of homologus recombination
CO5: Classify the RNA and its structure
CO6: Explain the process of transcription in eukaryotes
CO7: Summarize the regulation of gene expression in prokaryotes
CO8: Differentiate between the prokaryotic and eukaryotic translation

Subject: Animal Development Biology (BT-403)

At the end of the course, students will be able to

CO1: Differentiate between Gametogenesis and Oogenesis, spermatogenesis
CO2: List out the types of eggs on the basis of yolk
CO3: Explain the type and mechanism of cleavage
CO4: Describe the process of Gastrulation in early embryos
CO5: Illustrate model of determination and differentiation
CO6: Understand the terms primary, secondary and tertiary embryonic induction
CO7: Summarize the method of organogenesis
CO8: Practice a well labeled diagram of extra embryonic inductions and membranes

Subject: Mammilian Physiology (BT-404)

At the end of the course, students will be able to

CO1: Explain mechanism of digestion and absorption of carbohydrates

CO2: Discuss transport route of CO_2
CO3: Define threshold stimulus
CO4: Illustrate modes of excretion
CO5: Compare structure of smooth and skeletal muscles
CO6: Differentiate between thyroid and parathyroid gland
CO7: List out important events takes place during isometeric contraction
CO8: Sketch cardiac cycle events

Subject: Physical Chemistry (BT-405)

At the end of the course, students will be able to

CO1: Describe IInd law of thermodynamics, Carnot's cycle, thermodynamics scale of temperature, entropy, entropy as a criteria of spontaneity and equilibrium
CO2: Describe IIIrd law of thermodynamics, Gibbs and Helmholtz equation, criteria for thermodynamic equilibrium and spontaneity
CO3: Explain the electrolytic cell, different types of cells, types of reversible electrodes, Nernst equation, standard electrode potential, electro chemical series and its application
CO4: Explain the concentration cells with and without transference, potentiometric titration

Subject: Organic Chemistry (BT-406)

At the end of the course, students will be able to

CO1: Describe molecular vibrations, Hooke's law, selection rules, structure and nomenclature of amines, physical properties of amines, diazonium salts, nitro compounds, aldehyde and ketones
CO2: Illustrate interpretation of IR spectra of simple organic compounds, mechanism of electrophilic substitution reactions in Nitro arenes and their reduction in acidic, neutral and alkaline medium
CO3: Know about MPV, Clemensen, Wolf-Kishner, Bayer-Villiger oxidation, Witting reaction, Mannich RX^n , Perkin, Knoevenagel RX^n, aldol, benzoin condensation
CO4: Differentiate between $LiAlH_4$ and $NaBH_4$ reductions, fingerprint region, absorption of various functional groups

Subject: Inorganic Chemistry (BT-407)

At the end of the course, students will able to

CO1: Describe Lanthanides, actinides, interference of acid radicals including their removal in the analysis of basic radicals
CO2: Illustrate electronic st., oxidation states, ionic radii, lanthacide contraction, complex formation, occurane and isolation
CO3: Know about theory of qualitative analysis and quantitative analysis

CO4: Differentiate between properties of lanthanides and actinides

Subject: (BT-408)

At the end of the course, students will be able to

CO1: Learn the skills to search and explore different topics in seminar related to molecular biology, developmental biology and physiology

Subject: Practical (BT-409)

At the end of the course, students will be able to

CO1: Describe functional group of organic compounds
CO2: Illustrate about alcohol, carboxylic acid, amine, nitro compounds
CO3: Know about gravimetric analysis of DMG

Subject: Lab Course-II (BT-410) (BT-401 to BT-404)

At the end of the course, students will be able to

CO1: Classify and identify various specimens of Animal kingdom
CO2: Develop the skill of handling the agnose gel electrophonesis of genomic DNA and plasmid DNA
CO3: Prepare temporary stained mount of chick embryo
CO4: Analyze different haematology practicals

Semester V
Subject: Bioinformatics (BT-501)

At the end of the course, students will be able to

CO1: Recall history of bioinformatics
CO2: Explain PDB
CO3: Discuss data generating techniques
CO4: Demonstrate PCR
CO5: Distinguish between BLAST and FASTA
CO6: Evaluate results of multiple sequence alignment (MSA)
CO7: Give examples of Gene identification tools
CO8: Illustrate pattern and repeat finding

Subject: Recombinant DNA Technology (BT-502)

At the end of the course, students will be able to

CO1: Define gene recombinant and gene transfer technique
CO2: Differentiate between conjugation, transformation and transduction
CO3: Describe the method of direct mutagenesis and PCR based site mutagenesis
CO4: List out the production of chimeric proteins
CO5: Explain the method of genetic engineering in animals
CO6: Summarize the production of protein with the help of pharmaceutical values
CO7: Analyze the genetic engineering methods in plants
CO8: Illustrate the process of DNA transfer to plants

Subject: Immunology (BT-503)

At the end of the course, students will be able to

CO1: Classify the molecular structure of immuno globuline or antibodies
CO2: Differentiate between T-cells, helper T-cells and suppressor T-cells
CO3: Explain the regulation of immuno globulin gene expression
CO4: Understand the allotypes, ideo types and allelic exclusion
CO5: Describe the process of major histo compatibility complexes of class I and class II MHC antigens
CO6: Upgrade the knowledge about vaccines and vaccination
CO7: Illustrate the immuno diagnostic by use of RIA and ELISA

Subject: Genomics and Proteomics (BT-504)

At the end of the course, students will be able to

CO1: Introduce the term genomics and DNA sequencing
CO2: Explain the method of maxma and gilbert, sangeers and pyrosequencing
CO3: Analyze the softwares: ENSEMBL, VISTA, NCBI and UGC genome
CO4: Describe vander waal interactions and hydrophobic interactions
CO5: Illustrate the process of SDS-PAGE and Native PAGE
CO6: Discuss the process of proteomes including 2D-PAGE
CO7: List out mass spectometric data of De novo sequencing

Subject: Physical Chemistry (BT-505)

At the end of the course, students will be able to

CO1: Describe quantum mechanics with explaining the postulates of quantum mechanics operator and their relations, wave function

CO2: Understand physical properties and molecular structure by the use of dipole moment, magnetic permeability and magnetic properties
CO3: Understand basic concepts of spectroscopy, born oppenheimer approximation and degree of freedom, rotational spectrum
CO4: Explain selection rules, vibrational and rotational spectra of molecules

Subject: Organic Chemistry (BT-506)

At the end of the course, students will be able to

CO1: Understand NMR spectroscopy, PMR spectrum, shielding - deshielding of proton with magnetic equivalence of protons
CO2: Describe PMR spectra of molecules with structure determination of organic compounds
CO3: Explain carbohydrates, mechanism of osazone formation, conversion, mechanism of mutrarotation
CO4: Describe disaccharide and polysaccharides organometallic compounds - structure, formation and chemical reaction.

Subject: Inorganic Chemistry (BT-507)

At the end of the course, students will be able to

CO1: Know about metal-ligand bonding in transition metal complexes, thermodynamic and kinetics aspects of metal complexes
CO2: Describe substitution reactions of square planar complexes of Pt (II) and factor affecting stability
CO3: Illustrate types of magnetic behavior, L-S coupling, orbital contribution to magnetic moments, application of magnetic moment data for 3D metal complexes
CO4: Explain the types of electronic transitions, selection rules for d-d- transition, orgel-energy level diagram

Subject: Practical (BT-508)

At the end of the course, students will be able to

CO1: Analyze acid and basic radicals by using semi-micro qualitative method
CO2: Illustrate acidic and basic radicals
CO3: Determine Rf values and identify organic compounds in green leaf and colured organic compounds by thin layer chrometography

Subject: Practical (BT-509) (BT-501 to BT-504)

At the end of the course, students will be able to

CO1: Understand sequence information resource and various BLAST
CO2: Isolate DNA from plants and E-coli
CO3: Making of competent uses
CO4: Develop the skills of handling the blood samples
CO5: To perform SDS PAGE

Semester VI
Subject: IPR Entrepreneurship Bioethics and Biosafety (BT-601)

At the end of the course, students will be able to

CO1: Define patent and its requirement
CO2: Explain patenting in biotechnology
CO3: Describe Entrepreneurship and the basic regulation of excise
CO4: Illustrate different paradigms of Bioethics
CO5: Discuss National and International ethical issues against molecular technology
CO6: Deduce biosafety levels and different types of risk groups associated with it
CO7: Distinguish between GLP and GMP

Subject: Animal Biotechnology (BT-602)

At the end of the course, students will be able to

CO1: Explain transgenesis
CO2: Discuss trypanosomiasis
CO3: Compare the process of artificial insemination and stem cell technology
CO4: Elaborate conservation biology via embryo transfer techniques
CO5: Illustrate problems and ethics associated with human genetic engineering
CO6: Describe different types of gene therapy
CO7: Classify applications of stem cell technology
CO8: Inspect vectors in gene therapy

Subject: Bioprocess Technology (BT-603)

At the end of the course, students will be able to

CO1: Introduce the technique of bio processing
CO2: List out the type of microbial culture and its growth kinetics
CO3: Design the bio process vessels
CO4: Identify the types of culture and production vessels

CO5: Describe the principles of upstream process-media preparation, inoculation and sterilization
CO6: Analyze the bio process measurement and control system with special reference to computer aided control
CO7: Illustrate the process of product recovery and purification
CO8: Enhance the microbial production and single cell proteins

Subject: Plant Biotechnology and Environmental Biotechnology (BT-604)

At the end of the course, students will be able to

CO1: Explain the technique of micro propagation
CO2: Describe the principles and applications of protoplast isolation
CO3: Summarize the term somatic hybridization
CO4: Illustrate the practical applications of somatic hybridization
CO5: Differentiate between the hybrids and cybrids
CO6: Enhance microbiological quality of food and water
CO7: Examine the process of bioremediation
CO8: Analyze the biological control of other insects swarming the agricultural fields

Subject: Physical Chemistry (BT-605)

At the end of the course, students will be able to

CO1: Understand electronic spectrum by potential energy curves and frank-codon principle
CO2: Explain interaction by radiation with matter, photochemistry laws and different types of processes
CO3: Describe solution, its types, use of their colligative properties, ideal and non-ideal solution
CO4: Understand phase component, degree of freedom, phase equibria of one component and two component system

Subject: Organic Chemistry (BT-606)

At the end of the course, students will be able to

CO1: Explain heterocyclic compound with mechanism of electrophilic substitution and nucleophilic substitution
CO2: Describe five and six memb. heterocycles with their synthesis, also describe organosulphur compound, methods of formation and chemical reaction
CO3: Understand organic synthesis via enolates and reaction, mechanism and st. of synthetic polymers
CO4: Illustrate amino acid, protein and peptide st., sythesis and classification

Subject: Inorganic Chemistry (BT-607)

At the end of the course, students will be able to

CO1: Illustrate nomenclature and classification of organometallic compounds, metal-ethylenic complexes, nature of bonding in metal carbonyls
CO2: Differentiate between acid and base by using different concept: lewis, arrhenius, bronsted-lowry and lux-flood symbiosis
CO3: Explain metalloporphyrins with special reference to haemoglobin and myoglobin, biological role of alkali and alkaline earth metal
CO4: Describe silicon and phosphazenes, their preparation, properties, structure and uses

Subject: Practical (BT-608)

At the end of the course, students will be able to

CO1: Present industrial and training report in a form of seminar and powerpoint presentation

Subject: Practical (BT-609)

At the end of the course, students will be able to

CO1: Determine strength of monobasic and dibasic acid solution conductometrcally, potentiometrically, pH-metrically
CO2: Determine molecules wt. of non-volatile solute by Rast method
CO3: Synthesize organic compounds like P-bromoaniline from P-bromoacetanilide and m-nitroaniline from m-dinitrobenzene

Subject: (BT-610) (BT-601 to BT-604)

At the end of the course, students will be able to

CO1: Plan establishing hypothetical biotechnological entrepreneurship industry in India
CO2: Develop the skills of handling the sterilization techniques in animal tissues
CO3: Able to calculate the bacterial and microbial curves
CO4: Demonstrate various steps of micro-propagation

Programme Name - B.B.A.

Programme Outcomes of BBA

PO1: The course will focus on the cross integration of business functions with emphasis on accounting, marketing, finance and management as well as legal and ethical environment of business

PO2: The students will learn analytical and problem solving skills in the functional areas of banking sector/finance companies

PO3: The course will teach students how to do team work in multidisciplinary settings business and management practices

PO4: Knowledge and understanding of ethical, legal and social obligation and responsibilities of business will be clear to students

PO5: One can opt for competitive entrance tests like CAT, MAT, GMAT, GRE or for higher studies

PO6: The students will learn ethical principles in the business environment with people of diverse ethnic, cultural, gender and other backgrounds

Programming Specific Outcome of BBA

PSO1: Practical training in management successfully prepares students to work for business enterprises/organizations

PSO2: Knowledge of Information Systems in organizations, business statistics, e-business, research methods, finance, economics, project management, operation management, human resource management and knowledge of business terminology is good for budding entrepreneurs

PSO3: The students gain exposure to the industrial world for learning business strategies preparing them to work in Professional business environment

PSO4: With a graduate degree in BBA one can go for competitive exams, like TOEFL or IELTS

PSO5: With a management degree in hand students can solve structured and unstructured business problems and issues using logical reasoning patterns

Semester I
Subject: Business Organization (BBAN-101)

At the end of the course, students will be able to

CO1: Understand organization, structure and its effectiveness
CO2: Learn forms of organization
CO3: Know the techniques of Entrepreneurship
CO4: Describe feasibility and preparation of business plans
CO5: Plan role of CII, FICCI, ASSOCHAM, NASCOM, etc.
CO6: Study functioning of Stock Exchange
CO7: Know strategies of Government and business interface

CO8: Evaluate business and environment interface

Subject: Business Mathematics (BBAN-102)

At the end of the course, students will be able to

CO1: Describe union, intersection, compliment and difference of sets
CO2: Apply set theory to practical problems
CO3: Learn about indices and logarithms
CO4: Be familiar with arithmetic ad geometric progressions and their business application
CO5: Understand permutations and combinations
CO6: Study properties and elementary operations of matrices
CO7: Find differentiation and integrations of standard algebraic functions
CO8: Learn use of matrices, differentiation and integration in business problems

Subject: Financial Accounting (BBAN-103)

At the end of the course, students will be able to

CO1: Understand the meaning of accounting, principles, concepts and conventions, accounting process, preparation of trial balance
CO2: Learn concept of rectification of errors, preparation of final accounts with adjustment
CO3: Get awareness about the bank reconciliation statement, accounts of non-profit organization, single entry system
CO4: Get familiar with joint venture accounts and final consignment accounts

Subject: Computer Fundamentals (BBAN-104)

At the end of the course, students will be able to

CO1: Learn about the basics of computer like components, input-output devices and memory
CO2: Understand the number system
CO3: Know about various types of operating systems
CO4: Understand various applications of computer

Subject: Business Communication (BBAN-105)

At the end of the course, students will be able to

CO1: Learn the skills of business communication : Nature, process, forms, role, barriers
CO2: Master communication skills and listening skills
CO3: Get expertise written communication : types, structures, layout of business letters and presentative letters

CO4: Write business reports : Purpose and types, brochures, issuing notice, agenda of meeting, recordings of minutes of meeting

Subject: Micro Economics for Business Decisions (BBAN-106)

At the end of the course, students will be able to

CO1: Define the nature and scope of micro economics
CO2: List and explain the determinants of demons and supply
CO3: Demonstrate the impact of shifts in both market supply and demand curves on equilibrium price as output
CO4: Compare and contrast the different forms of market
CO5: Discuss the various concepts of cast curves and their inter relationship
CO6: Describe the effects of different markets on the price and output of product
CO7: Employ marginal analysis for decision making
CO8: State marginal productivity theory and modern theory of distribution
CO9: Apply micro economic theories to solve issues and problems
CO10: Explain the factors affecting the size and location of firms

Semester II
Subject: Principle of Management (BBAN-201)

At the end of the course, students will be able to

CO1: Know about manager skills and role
CO2: Explain management challenges
CO3: Describe strategic planning and its effectiveness forms of plans
CO4: State decision making and forms of group decision
CO5: Demonstrate leadership skills and approaches
CO6: Learn delegation of authority and responsibility
CO7: Control mechanism
CO8: Understand controlling techniques and social audit

Subject: Macro-Economic Analysis (BBAN-202)

At the end of the course, students will be able to

CO1: Understand the behaviour of Indian and world economy
CO2: Analyze macro economic policies including fiscal and monetary policies of Indian
CO3: Determine economic variables including inflation unemployment poverty, GDP, BOP
CO4: Know the functions of banks monetary policy and monetary measures to control the credit

Subject: Company Accounts (BBAN-203)

At the end of the course, students will be able to

CO1: Explain the meaning of share capital transaction, alteration and buy lack of shares, acquisition of business and profit prior to incorporation
CO2: Understand the meaning of debentures, its redemption and underwriting of shares and debentures
CO3: Know about the balance sheet according to schedule VI of the companies act, basic features of AS-4, 15, 17, 18, 5, 29, company liquidation accounts
CO4: Know about the concept of goodwill and shares, banking company accounts, insurance company accounts

Subject: Computer Applications in Management (BBAN-204)

At the end of the course, students will be able to

CO1: Describe computers, define networking, virus and firewalls
CO2: Define application of computers, learn about internet and its basics
CO3: Learn about data, information and define various information systems
CO4: Define multimedia and its applications

Subject: Organizational Behaviour (BBAN-205)

At the end of the course, students will be able to

CO1: Know the meaning of OB, historical development, emerging trends and hanging profiles of workforce, foundations of OB, challenges of OB
CO2: Describe the foundations of individual behaviour, personality, values, attitudes, perception, learning and motivation, emotional intelligence
CO3: Understand the foundations of group behaviour, team processes, group dynamics, teams and teamwork, power and politics
CO4: Demonstrate Organizational processes: Organizational structure and design, organizational culture, change, development and stress management

Subject: Business Statistics (BBAN-206)

At the end of the course, students will be able to

CO1: Understand the meaning, scope, limitations and applications of statistics
CO2: Learn about classification and its types
CO3: Know measures of central tendency and dispersion
CO4: Describe the meaning of correlation and regression
CO5: State properties of correlation co-efficient, rank correlation and co-efficient of regression

CO6: Be familiar with index numbers and time series
CO7: Construct simple, quantity and value index numbers
CO8: Use time series in business forecasting and its limitations

Semester III
Subject: Cost and Management Accounting (BBAN-301)

At the end of the course, students will be able to

CO1: State the meaning of elements of cost, cost sheet, types of costing, difference between cost accounting and financial accounting, material control, inventory levels
CO2: Understand labour cost control, job costing, batch costing, contract costing, process costing
CO3: Understand the meaning of management accounting, marginal costing, responsibility accounting, budgeting
CO4: Be familiar with types of financial statement, ratio analysis, fund flow and cash flow analysis, techniques in performance measurement, capital budgeting techniques

Subject: Marketing Management (BBAN-302)

At the end of the course, students will be able to

CO1: Establish a professional presence online incorporating the key disciplines of social media, search engine optimization, analytics, online navigation and user experience in order to drive traffic to an organization's website
CO2: Employ digital tools to analyze the effectiveness of a marketing campaign
CO3: Formulate a marketing plan including marketing objectives, marketing mix, strategies, budgetary considerations and evaluation criteria
CO4: Prepare and deliver a sales presentation
CO5: Communicate marketing information persuasively and accurately in oral, written and graphic formats

Subject: Capital Markets (BBAN-303)

At the end of the course, students will be able to

CO1: Understand role of capital market, its instruments and innovation in financial instruments
CO2: Be familiar with primary and secondary market, its methods of raising resources of primary market, trading and settlement, listing of securities, stock market index, steps taken by SEBI to increase liquidity in the stock market
CO3: State the meaning of depositary system NSDL and SHCIL, debt market
CO4: List development Banks: IFCI, IDBI, ITBI, SIDBI, IDFCL, EXIM Bank, NABARD and ICICI, meaning and benefits of mutual funds

Subject: Introduction to Information Technology (BBAN-304)

At the end of the course, students will be able to

CO1: Know about the basic concept of toolbox, menus, creating, editing, format, header, footer, mail merge, macros, file management and printing in MS-Word
CO2: Understand the concept of creating, editing, formatting, graphs, macros, condition formatting in electronic spreadsheet
CO3: Learn about the enhancing slides, excel charts, word art, animations and sonnets, inserting pictures, inserting sound in MS-Powerpoint
CO4: Learn about the basic concept of Tally
CO5: Get practical learning on MS-Word, MS-Excel, MS-Powerpoint and Tally

Subject: EVS (BBAN-305)

At the end of the course, students will be able to

CO1: Correlate the factors of Ecosystem
CO2: Pay attention towards their environment
CO3: Know the need to conserve and preserve the natural resources
CO4: Develop the skills to enhance the quality of their environment
CO5: Understand the variation among organisms through biodiversity
CO6: Analyze the population growth and will try to work upon the idea and schemes to control it
CO7: Figure out the impacts of nature/environment on living organisms

Subject: Disaster Management (BBAN-306)

Objectives of Disaster Management:
Disaster Management aims to reduce, or avoid, the potential losses from hazards.

At the end of the course, students will be able to

CO1: Know Disaster Management aims to reduce, or avoid, the potential losses from hazards
CO2: Master assure prompt assistance to victims
CO3: Achieve rapid and effective recovery
CO4: Address pre-existing risks
CO5: Understand that effective disaster management reduces or avoids morbality, morbidity and economic and physical damages from a hazard

Semester IV
Subject: Financial Management (BBAN-401)

At the end of the course, students will be able to

CO1: Figure out evolution, scope and functions, objectives of financial management, profit VS wealth maximization, time value of money
CO2: Understand investment decisions: capital budgeting and cost of capital
CO3: Formulate financing decision: operational and financial leverage, capital structure theories - NI, NOI and traditional approach, EPS - EBIT analysis
CO4: Learn dividend decision, management of cash, working capital, receivables, inventory

Subject: Human Resource Management (BBAN-402)

At the end of the course, students will be able to

CO1: Learn HRM function, objectives, scope, policies
CO2: Master BPO/KPO outsourcing management
CO3: Demonstrate job analysis, job rotation, job design, job enrichment, enlargement, etc.
CO4: Understand employee training methods and evaluation
CO5: Understand career planning and development, employee retention, succesion planning
CO6: Master performance appraisal system
CO7: Establish HR healthy practices
CO8: Establish rewards/pay plans

Subject: Research Methods (BBAN-403)

At the end of the course, students will be able to

CO1: State Business Research: its methods, steps, types, hypothesis, research proposal
CO2: Formulate research design, methods of exploratory research, experimental design, its measurement seals
CO3: Understand sampling design, procedure, sample size, research methods of collecting primary data and questionnaire
CO4: Define statistical techniques of data analysis : descriptive, uni-variate, bivariate, research report

Subject: Business Law (BBAN-404)

At the end of the course, students will be able to

CO1: Understand Indian Contract Act 1872, meaning and essentials of a valid contract offer and acceptance, capacity to contract, free consent of parties
CO2: Define void contracts, quasi contracts, modes of discharge of contract and will be able to recognize the consequences of breach of contract

CO3: Evaluate contact of guarantee, kinds of guarantee, rights and obligations of creditors, surety, concepts of bailment and pledge

Subject: Database Management System (BBAN-405)

At the end of the course, students will be able to

CO1: Learn and understand about database management system in detail and differentiate between file oriented system and database system
CO2: Understand about database system architecture
CO3: Learn about database security, firewalls, database recovery and distributes database
CO4: Learn about emerging database technologies, internet, database, digital libraries and multimedia, mobile and spatial databases

Subject: Human Rights and Values (BBAN-406)

At the end of the course, students will be able to

CO1: Understand Human Rights : concepts, evolution, movements in India, classification, liberty and dignity, right to equality, right against exploitation, economic, political and social rights
CO2: Know about Redressal of Poverty, overpopulation, problem of unsustainable development, disadvantaged groups - women, children, SC and ST, homeless and slum dwellers, physically and mentally handicapped, refugees
CO3: Classify redressal and relations of Human rights
CO4: Demonstrate the concept of Human values: character formation towards positive personality, value education towards national and global development

Semester V
Subject: Production and Materials Management (BBAN-501)

At the end of the course, students will be able to

CO1: Understand production economics, Production systems, plant location
CO2: Learn production planning and control, PPC and production systems, sequencing and assignment problems, inventory control, quality control
CO3: Demonstrate material management, MIS (Material Information System), standardization, simplification and variety reduction, value analysis and engineering
CO4: Comprehend store management and warehousing management, material handling, traffic and transportation, disposal of scraps, scruples and obsolete materials

Subject: Company Law (BBAN-502)

At the end of the course, students will be able to

CO1: Determine the nature, components of determinants of business environment, economic systems along with the growth of public and private sectors, social responsibility and economic reforms since 1991
CO2: Review the industrial policy developments and pattern of industrial growth since 1991 along with understanding of concepts such as industrial licensing policy, public sector reforms, privatization, liberalization, SMEs and industrial sickness
CO3: Analyze the current developments in the banking sector, regulations of stock exchange and role of SEBI
CO4: Comprehend the challenges facing public sector banks and changing structure of Non-Bank financial institutions
CO5: Evaluate the trend and pattern of India's foreign trade and balance of payments along with FDI policies, globalization trends, role of MNCs and impact of multilateral institutions (IMF, World Bank of WTO)

Subject: Indian Business Environment (BBAN-503)

At the end of the course, students will be able to

CO1: Comprehend the meaning of company, its features, kinds of companies, registration process, its memorandum of association and article of association, etc.
CO2: Analyze the concept of share - capital including meaning of shares, issues and allotment of shares, types, alteration, buy-back, surrender forfeiture and bonus share along with debentures and its kinds
CO3: Understand the types of Directors and their qualification, appointment, duties and remuneration along with various types of meetings such as statutory, annual general meeting and extra-ordinary general meeting
CO4: Evaluate ways of prevention of opposition and mismanagement along with the concept of winding up - types, appointment of liquidator, conduct of winding up, etc.

Subject: Computer Network and Internet (BBAN-504)

At the end of the course, students will be able to

CO1: Understand the basic concepts like network topologies, along with digital signals, etc.
CO2: Describe the various networking models, protocols, and flow control mechanism
CO3: Learn about routing and cryptography
CO4: Describe the various concepts related to Internet
CO5: Know intranet architecture, security design and future of Intranet
CO6: Create and publish a web page via HTML

Subject: Presentation Skills and Personality Development (BBAN-505)
At the end of the course, students will be able to

Learning Outcomes
By the end of the soft skills training program, the students should be able to:

- Develop effective communication skills (spoken and written)
- Develop effective presentation skills
- Conduct effective business correspondence and prepare business reports which produce results and skill sets.

Subject: Cyber Security (BBAN-506)

At the end of the course, students will be able to

CO1: Describe about Information society, knowledge society, cyber space, critical infrastructure and internet as global information infrastructure
CO2: Learn and describe about cyber terrorism, factors contributing to the existence of cyber terrorism and real example of it
CO3: Define cyber crime, its types, criminal threats to IT infrastructure, web security, your role on cyber attacks, cyber crime and law and Indian IT Act
CO4: Learn and describe about fundamental concepts of information security, information warfare, its levels and cost, cyber disaster planning, companywide disaster planning and business impact analysis

Semester VI
Subject: Income Tax (BBAN-601)

At the end of the course, students will be able to

CO1: Understand the concept of Income Tax and Residential status alongwith various exemptions to the Income Tax and Agricultural Income
CO2: Classify Income as that from 'Salaries" and "House Property"
CO3: Evaluate Income from capital gains and also analyze profits and gains of business and profession and concept of depreciation
CO4: Assess income from other sources and club and set-off and carry forward the losses after making deductions from computations of total income

Subject: System Analysis and Design (BBAN-602)

At the end of the course, students will be able to

CO1: Know about the basic concepts of related to system analysis and steps of SDLC and various case tools use
CO2: Learn about the concepts of system design

CO3: Understand the concept of data dictionary, decision table, decision tree and logical design to physical implementation
CO4: Know about the concept of distributes data process and real time system

Subject: Foundation of International Marketing (BBAN-603)

At the end of the course, students will be able to

CO1: Define the marketing principles that together constitute the field of study known as international marketing
CO2: Illustrate the steps and processes involved in planning market entry strategy of a firm into a foreign market. Communicate effectively in oral and written forms about international marketing using appropriate concepts, logic and rhetorical conventions

Subject: Consumer Protection (BBAN-604)

At the end of the course, students will be able to

CO1: Understand Consumer Protection: approaches, need, buying motives, doctrines of caveat emptor and venditor, basic consumer rights
CO2: Explain Consumer Protection Act 1986, organizational set up for consumer protection under CPA, procedure of filing a complaint, relief available
CO3: Illustrate Competition Act, Role of voluntary organization, consumer awareness - role of media and government, business self - regulation
CO4: Know recent development in consumer protection movement, role of advertising standard council of India in consumer protection

Subject: E-Commerce (BBAN-605)

At the end of the course, students will be able to

CO1: Know the basics of E-Commerce concepts, types of E-Commerce, also they come to know about designing, developing and deploying the system
CO2: Be familiar with technology for online business, middle ware contents, electronic payment systems, and tools for promoting website
CO3: Understand the applications of E-Commerce in various areas
CO4: Be familiar with concepts of virtual existence, designing E-Commerce models for middle level organization and how to implement security in E-Commerce

Programme Name - B.C.A.

Programme Outcomes of BCA

After graduation students will be able to

PO1: Improve their computer literacy, their basic understanding of operative systems and gain a working knowledge of software commonly used in academic and professional environments

PO2: Develop the skills to present ideas with the latest technology, tools and applications in IT in order to meet the ever-growing requirement of IT professionals

PO3: Demonstrate the ability to identify the business problems, analyze and access various issues, set appropriate criteria for decision making and draw appropriate conclusions

PO4: Exhibit communication and management skills, especially in providing technical support and develop IT oriented security issues and protocols

PO5: Blend proficiency in mathematics used in computer science, differentiate between various data structures used in programming language

PO6: Gain the knowledge of computer programs by using functional programming object oriented programming paradigms, apply techniques of software validations and reliability to computer programs

PO7: Serve as system administrators with through knowledge of DBMS, work as hardware designers and engineers with the knowledge of networking concepts

PO8: Demonstrate critical thinking and communication skills, which help in expressing ideas effectively

PO9: Develop interdisciplinary approach among the students

PO10: Acquire knowledge of algorithms and the role they play in developing programming techniques and computer science

Programme Specific Outcomes of BCA

BCA gives a number of opportunities to students for

PSO1: Preparing students for various roles to IT industry like web designer, system analyst, software developer and network administrator etc.

PSO2: Focusing on developing programming skills, networking skills and learning latest techniques of computer science

PSO3: Developing ability to use research, experiment to resolve industrial problems

PSO4: Developing ability to demonstrate team work with the quality leadership and analytical reasoning for solving various critical problems

PSO5: The students will be able to design, implement knowledge for computer programme

PSO6: This course will develop human values and professional ethics in the social, moral, spritual and legal aspects of computing techniques

Semester I

Subject: Computer and Programming Fundamental (BCA-101)

At the end of the course, students will be able to

CO1: Identify the components of computer and assemble the parts of computer
CO2: Work in different OS environments and to classify various types of viruses and antivirus softwares
CO3: Classify develop logics for the solution of programmes
CO4: Classify and describe various types of networks
CO5: Understand various elementary concepts of computer

Subject: PC Software (BCA-102)

At the end of the course, students will be able to

CO1: Understand the concept of operating system, its types and their features practically
CO2: Get practical learning on MS-Word and its general and advanced features
CO3: Get practical learning on MS-Excel, its different features as worksheet, database management and chart creation
CO4: Get technical learning on powerpoint presentations using different features as animation, graphic effects, sound effects, time effects and layering objects
CO5: Acquaint themselves with office automation softwares and their use according to application areas

Subject: Mathematics (BCA-103)

At the end of the course, students will be able to

CO1: Know the basics of set theory and its applications
CO2: Understand the concept of matrices and determinants
CO3: Learn about relations and its properties
CO4: Study different types of functions
CO5: Know about limits and continuity and how to compute them
CO6: Understand the differentiation and to find the derivations of different types of functions
CO7: Learn about integrals, their properties and how to evaluate them

Subject: Logical Organization of Computer-I (BCA-104)

At the end of the course, students will be able to

CO1: Learn about number system including binary arithmetic
CO2: Know about character codes and their representations and how to detect and correct errors

CO3: Explain Boolean Algebra and know how to simplify the Boolean functions via K-map
CO4: Implement basic and universal gates in circuits and also know the use of gates in multilevel NAND and NOR circuits
CO5: Understand combinational circuits and their application areas
CO6: Familiarize with addressing modes

Subject: Practical Software Lab (BCA-105)

At the end of the course, students will be able to

CO1: Create MS-Word documents, designing these document with bullets, numbering and other Word Art options in MS-Word
CO2: Design MS-Excel sheets using different styles of tables, charts, formulas, functions (Mathematics, Logical)
CO3: Create Powerpoint slides using single and multiple slides, animation and sound effects in it
CO4: Design a file using tools of MS-Office completely

Semester II
Subject: 'C' Programming (BCA-106)

At the end of the course, students will be able to

CO1: Understand the different types of symbols, words, syntax, structure and concepts of 'C' language
CO2: Learn about decision making, branching and looping statement and their implementation
CO3: Implement built-in functions, user defined functions and different programming techniques of 'C' language
CO4: Get practical learning of arrays, pointers, storage classes
CO5: Design/develop algorithms, flow charts to help development of efficient programmes

Subject: Mathematics (BCA-107)

At the end of the course, students will be able to

CO1: Understand the concept of sequential circuits
CO2: Design the register and counters via flip flop
CO3: Know about the memory and I/O devices
CO4: Know the role of instructions in computer architecture their cycle, set selection and format
CO5: Lay emphasis on the importance of interrupt structure

Subject: Mathematical Foundations of Computer Science (BCA-108)

At the end of the course, students will be able to

CO1: Understand about the measures of central tendency and measures of dispersion
CO2: Get familiar with algorithms, merits and demerits
CO3: Understand graphs, subgraphs, connected and disconnected graphs
CO4: Differentiate between Eulerian and Hamiltonian graphs
CO5: Learn to apply tree and graph algorithms to solve problem
CO6: Learn about Recursion and Recurrence relation
CO7: Know about PMI, GCD and Fibonacci nos.
CO8: Understand congruences and equivalence relations

Subject: Structured System Analysis and Design (BCA-109)

At the end of the course, students will be able to

CO1: Learn about system, SDLC, system planning and initial investigation, fact-finding and its techniques
CO2: Define - structured analysis, its tools, feasibility study in detail and also learn about cost and benefit analysis with its final action
CO3: Understand about system design, design methodologies, Input/Output and form design with their classification, requirements, objectives, types and layout considerations
CO4: Know about system testing, testing techniques, test plan and also understand about the system implementation, evaluation and maintenance with their types

Subject: Practical Software Lab - Based on Paper BCA-106 i.e. 'C' Programming (BCA-110)

At the end of the course, students will be able to

CO1: Implement the basic functions using 'C'
CO2: Understand the concept of operators
CO3: Analyze and understand different constructs in 'C'
CO4: Define various formatted/unformatted I/O functions using 'C'
CO5: Differentiate between the concepts of arrays and string

Semester III
Subject: Introduction to Operating System (BCA-201)

At the end of the course, students will be able to

CO1: Understand the need of operating system and define types of operating systems
CO2: Describe and define process, threads and interprocess communication

CO3: Evaluate and analyze various scheduling algorithms, identify deadlocks and describe the methods of handling deadlocks
CO4: Know and differentiate between physical and logical address, define swapping and various memory allocation technique, understand the concept of virtual memory and thrashing
CO5: Understand file management, structure and allocation method
CO6: Define and describe various disk scheduling algorithms

Subject: Data Structures-I (BCA-202)

At the end of the course, students will be able to

CO1: Understand the basic concepts of data structure like types, operations, applications, etc.
CO2: Acquire knowledge about how to describe and implement arrays and linked list
CO3: Define, describe and implement stack and queue
CO4: Understand the concepts related to tree and graphs

Subject: Introduction the Database System (BCA-203)

At the end of the course, students will be able to

CO1: Know about the basic concepts of database and also define various functions, components, advantages and disadvantages of DBMS
CO2: Learn about database system architecture, data independence and data models
CO3: Know about E-R model with practice of daily practical examples, relational data structures, database relations and its properties
CO4: Give the knowledge about relational algebra and relational calculus, and various normal forms of normalization technique in database
CO5: Give practical approach of basic commands of SQL, the query processing and query optimization

Subject: Communication Skills (English) (BCA-204)

At the end of the course, students will be able to

CO1: Demonstrate critical and innovative thinking on various issues
CO2: Display competence in written and oral communication
CO3: Apply communication theories and learn efficiency in language expression
CO4: Respond effectively to cultural communication differences
CO5: Demonstrate positive group communication exchanges

Subject: Practical Software Lab-Based on paper BCA-202 and 203 i.e. 'C' Language and SQL (BCA-205)

At the end of the course, students will be able to

CO1: Implement the various operations on string and arrays
CO2: Understand the concept of Recursion
CO3: Implement the operations of stock, queue and link list
CO4: Analyze and implement DDL and DML, DCL Commands
CO5: Implement constraints on tables with different types of key link (Primary, Unique and Not Null)

Semester IV
Subject: Web Designing (BCA-206)

At the end of the course, students will be able to

CO1: Learn Web designing basic terms like web browser, web server, http, TCP/IP and search engine and also understand how these terms are used
CO2: Learn about the basic steps to create website, and add image, picture, link, background, etc.
CO3: Understand the language HTML, how HTML language tags are used, and how these tags are helpful in making website
CO4: Define HTML list, table and forms, the forms with menu working radio button, check box, text box, etc.
CO5: Describe basic knowledge of DHTML JSSS and CSSP

Subject: Data Structures-II (BCA-207)

At the end of the course, students will be able to

CO1: Understand the concept of trees and various types of trees
CO2: Learn to identify shortest path for Warshall's and Dijkstra algorithm
CO3: Implement various sorting and searching algorithms
CO4: Classify various physical storage devices and files
CO5: Learn Hashing functions and collision resolution methods

Subject: Object Oriented Programming using C++ (BCA-208)

At the end of the course, students will be able to

CO1: Differentiate between procedural oriented programming and object oriented programming
CO2: Learn about syntax, structure and concepts of C++

CO3: Implement the concept of various access specifier in programmes and describe the various operators used in the language
CO4: Understand the concept of inheritance and polymorphism and classify the difference between overloading and overriding
CO5: Understand the concept of exception handling and use of templates

Subject: Software Engineering IV (BCA-209)

At the end of the course, students will be able to

CO1: Identify the various components of SRS document and their relevance
CO2: Describe the software project management and classify the various project planning techniques
CO3: Describe the various metrics related to each phase of software development life cycle
CO4: Understand the relationship between software design and software implementation
CO5: Describe the various software testing techniques
CO6: Write down the classification of various software maintenance methods and issues

Subject: Practical Software Lab-Bases on Paper BCA-206 and 206 i.e. HTML and C++ Programming (BCA-210)

At the end of the course, students will be able to

CO1: Implement the concept of object oriented programming using C++
CO2: Understand the implementation of the concept of polymorphism and inheritance
CO3: Understand the concept of exception handling and templates for implementation
CO4: Implement interactive Webpage(s) using HTML
CO5: Design a responsive webpage using FORMS

Semester V
Subject: Management Information System (BCA-301)

At the end of the course, students will be able to

CO1: Describe system and its basic concepts and information system in detail
CO2: Describe MIS, levels of Management, Simon's Model of decision making
CO3: Learn and describe developing information system and pitfalls in MIS development
CO4: Learn and describe Functional MIS that includes Personnel, Financial and production MIS, decision support system

Subject: Computer Graphics (BCA-302)

At the end of the course, students will be able to

CO1: Describe graphic system, application area of graphics, define various input output devices and differentiate between raster scan and random scan
CO2: Define various scan conversation of point, line, circle and ellipse, filled area primitives
CO3: Evaluate and define and evaluate 2d transformation, viewing pipeline and clipping algorithms
CO4: Define and evaluate 3d transformation, viewing pipeline and clipping algorithms

Subject: Data Communication and Networking (BCA-303)

At the end of the course, students will be able to

CO1: Understand the basic concepts like computer network topologies, design issues and protocols like X25, Frame relay, ATM etc.
CO2: Describe the various communications and networking models like OSI, TCP/IP, etc.
CO3: Understand the various concepts of analog and digital communications that includes representation, data encoding techniques, etc.
CO4: Describe various modulation techniques, types of transmission media and various switching and multiplexing techniques
CO5: Learn about data link layer responsibilities and their implementation like media access control protocols, various LAN technologies and various network hardware components
CO6: Describe various network layer and routing concepts, and various network security methods

Subject: Visual Basic (BCA-304)

At the end of the course, students will be able to

CO1: Understand the overview of programming language (visual and non-visual)
CO2: Understand VB application environment and event driven programming
CO3: Learn about basic programming concepts like variables, operators and various control for I/O in VB
CO4: Implement various control constructs, arrays and collections used in VB
CO5: Learn and implement about procedure, subroutine and menu driven programming
CO6: Get practical learning on Visual Basic

Subject: Practical Software Lab Based on Paper BCA-302 and 304 i.e. Graphics and VB (BCA-305)

At the end of the course, students will be able to

CO1: Implement line drawing algorithms
CO2: Create images using basic functions
CO3: Develop a Graphical User Interface (GUI) based on problem description
CO4: Develop and debug applications using VB that runs under operating system

Semester VI
Subject: E-Commerce (BCA-306)

At the end of the course, students will be able to

CO1: Know the concepts of E-Commerce and their usage in daily life
CO2: Know the use of E-payment system other e- techniques and security mechanism
CO3: Know the difference between traditional and modern e-payment system
CO4: Know the practical usage of e-payment apps
CO5: Familiarize with EDI technology and its working
CO6: Learn about the concept of EDI standards, EDI implementation, EDI agreement and EDI security

Subject: Object Technologies and Programming using Java (BCA-307)

At the end of the course, students will be able to

CO1: Differentiate between procedure and object oriented programming
CO2: Describe how object oriented methodologies are used in Java
CO3: Understand why Java is called platform independent language
CO4: Define and implement concept of inheritance and polymorphism
CO5: Define and implement the concept of package, interface and exception handling
CO6: Differentiate between string and string builder class. Learn about multi threading and I/O in Java

Subject: Artificial Intelligence (BCA-308)

At the end of the course, students will be able to

CO1: Understand and describe the concept of problem space and search
CO2: Learn about various heuristic search techniques
CO3: Evaluate and analyze various techniques and issues in knowledge representation
CO4: Understand the various natural language processing concepts and various learning methods
CO5: Describe the various components of an expert system and about expert system shells

Subject: Introduction to .Net (BCA-309)

At the end of the course, students will be able to

CO1: Learn about framework, features and architecture of .Net
CO2: Define the namespace, types and objects in .Net and learn about the evaluation of web development
CO3: Describe class libraries and define .net assemblies, meta data and attributes and learn about characteristics of C# and different types of variables and scope of variables
CO4: Understand and implement operators and expressions used in C# and implement various control constructs used in C#
CO5: Define classes and methods with the help of C# programming and implement the concept of constructor, destructor and overloading of operators and functions
CO6: Learn and implement concept of inheritance, polymorphism, exception handling and learn about input/output streams used in C#
CO7: Get practical learning on .Net programs

Subject: Practical Software Lab Based on Paper BCA-307 and 309 using Java and .Net (BCA-310)

At the end of the course, students will be able to

CO1: Implement the basic concept like Data types variables, constants, default values, boxing and unboxing with the help of Java and .Net
CO2: Create the program implementing the concept of operators and expressions in Java and .Net
CO3: Implement the concepts of object oriented programming in Java and .Net
CO4: Implement inheritance and polymorphism in Java and .Net