2.6.1- **Program Outcomes and Course outcomes for all programs offered by this institution are stated as below for the year 2019-20**

Common Outcomes of all Bachelor Programs:

- Understand the world, their country, their society, as well as themselves and have awareness of ethical problems, social rights, values and responsibility to the self and to others.
- Understand different disciplines from natural and social sciences to mathematics and art, and develop interdisciplinary approaches in thinking and practice.
- Think critically, follow innovations and developments in science and technology, demonstrate personal and organizational entrepreneurship and engage in life-long learning in various subjects.
- Communicate effectively English and Hindi by oral, written, graphical and technological means.
- Take individual and team responsibility, function effectively and respectively as an individual and a member or a leader of a team; and have the skills to work effectively in multi-disciplinary teams.
- Develop knowledge of theories, concepts, and research methods in humanities and social sciences.
- Assess how global, national and regional developments affect society.
- Know how to access and evaluate data from various sources of information.

B.A. Courses in Geography outcomes

Department of Geography Programme specific outcome

- Geography mainly concerns changes in spatial attributes in a temporal perspective. The Honours programme in geography is tailored to meet the students' specific educational and professional goals in mind.
- It focuses on spatial studies, qualitative as well as quantitative, and emphasizes on human-environment relationship. During the first year of the programme, the students are trained on advanced concepts of physical and human geography.
- The third year allows them to concentrate on specific areas of the subject, on which they complete their field reports. After completing the course, the students will be amply prepared for professional careers in geography and allied disciplines like GIS and Remote Sensing. They will also be able to pursue M.A. /M.Sc. Course in Geography.
- Acquiring Knowledge of Physical Geography: Student will gain the knowledge of physical geography. Student will have a general understanding about the geomorphologic and geotechnical process and formation. They will be able to correlate the knowledge of physical geography with the human geography.
- Acquiring Knowledge of Human Geography: They will be able to acquire the knowledge of Human Geography and will correlate it with their practical life.
- Ability of Problem Analysis: Student will be able to analyses the problems of physical as well as cultural environments of both rural and urban areas. Moreover, they will try to find out the possible measures to solve those problems.
- Conduct Social Survey Project: They will be eligible for conducting social survey project which is needed for measuring the status of development of a particular group or section of the society.
- Application of modern instruments: Students will be able to learn the application of various modern instruments and by these they will be able to collect primary data.
- Application of GIS and modern Geographical Map Making Techniques: They will learn how to prepare map based on GIS by using the modern geographical map making techniques.

- Development of Observation Power: As a student of Geography Course they will be capable to develop their observation power through field experience and in future they will be able to identify the socio environmental problems of a locality.
- Development of Communication Skill and Interaction Power: After the completion of the project they will be efficient in their communication skill as well as power of social interaction. Some of the students are being able to understand and write effective reports and design credentials, make effective demonstrations, and give and receive clear instructions.
- Enhancement of the ability of Management: Demonstrate knowledge and understanding of the management principles and apply these to theirs own work, as a member and leader in a team, to manage projects. They will perform effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- Understand Environmental Ethics and Sustainability: Understand the impact of the acquired knowledge in societal and environmental contexts, and demonstrate the knowledge of need for sustainable development. PSO11.Life-long learning: Identify the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of societal and environmental change**.**

M.A. Courses in Geography **Program outcomes**

Learning outcomes
Our must demonstrate proficiency in scientific inquiry, critical thinking and effective communication skills. these principles from the basis for the geography master s program learning
Programme specific outcome: -Students are able to

- The M.A. program emphasizes the geographic approach where students apply concepts of space, place location, scales, borders and region student will be able to state how a research project contribution to an existing body of geographic literature.
- Student will demonstrate a proficiency in knowledge of essential concepts of physical and human geography including; describing human environment and nature society interaction as well as global human and environmental issues.
- Understand not only the place where they live in but also about the lives of people living in other areas of the interconnected world. It also enhances understanding of the relationship between the global and the local level and the outcomes of these relationships (relationship between global processes and their local manifestations).
- Have deep knowledge about places, regions and spatial relationship as result of series of inter-related factors of nature, culture and individual human actions.
- Sensitize the need to conserve environment, resources in order to have a more sustainable earth.
- Have the theoretical knowledge with local realities by making field visits to different areas.
- Use and map the digital spatial data in more rational way.
- Understand the paradigm shifts all along with the process of historical development of geography as a subject of learning.

Geomorphology Course Outcomes: Students would be able to:

- Understand various aspects of landform growth and evolution on the Earth.
- Explain the basic conceptual and dynamic concepts of landform development.
- Understand the relevance of applied aspects of Geomorphology in various fields.

Climatology Course Outcomes: Students would be able to:

- Understand the global atmospheric circulations and disturbances.
- Understand the world climate systems, climatic variability and change.
- Sensitize the students with the future global environmental changes.

Resource geography Course Outcomes: Students would be able to:

- Sensitized to concept and classification of resources.
- Get knowledge about the models of natural resource process.
- Understand a deep sense about use and misuse, conservation and management of resources for sustainable development.

Statistical methods in Geography Course Outcomes: Students would be able to:

- Explain the nature and types of data and related statistical techniques.
- Make a rational choice amongst listed various statistical techniques.
- Describe and explain geographical data relationships.

Topographical Maps and interpretation Course Outcomes: Students would be able to:

- Understand the importance and uses of maps.
- Have knowledge about the relationship and juxtaposition of features therein.
- Represent various cultural & physical features using topographical maps.

Computer Aided Statistical Diagrams and Graphs Course Outcomes: Students would be able to:

- Understand computer and use of computer in Geography.
- Know the process of data input, data collection & data manipulation.
- Draw various diagrams through computer.

Geography of World Economy Course Outcomes: Students would be able to:

- Understand how in an increasingly globalized world, economic activities occur unevenly over geographical space.
- Know how local places and global economy are intertwined.
- Describe the regime of neoliberal policies are generating uneven geography of capitalist development.

Regional Development and Planning Course Outcomes: Students would be able to:

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

Environmental Geography Course Outcomes: Students would be able to:

- Know the importance of biodiversity to maintain ecological balance.
- Understand various environmental issues at national and international concerns.
- Understand the linkages between environment and biomes.

Urban Geography Course Outcomes: Students would be able to:

- Gain a better understanding of the process of urbanization.
- Understand the key aspects of cities and get an indication of the breadth of material that can be covered when examining cities.
- Get sensitized to the evolving urban planning visions.

Cultural Geography Course Outcomes: Students would be able to:

- Keep up to date with the theoretical aspects and conceptual base of this branch.
- Understand and evaluate the concept of culture in geography and its role and relevance in society.
- Understand the cultural environment and various cultural regions of the world.

Geography of India Course Outcomes: Students would be able to:

- Understand the geographical aspects of India.
- Have knowledge about Indian sub-continent contemporary issues.

- Understand demographic aspects of India.

Geography of Rural Settlements Course Outcomes: Students would be able to:

- Have knowledge about the historical development, patterns, types and functional systems of rural settlements.
- Know about the morphology of rural settlements.
- Understand the factors and rural settlement planning in India.

Soil Geography Course Outcomes: Students would be able to:

- Enhance their knowledge about the soils, its properties, development and degradation.
- Understand the management and conservation of soil resource with reference to India.
- Understand the linkages between soil, environment and biomes along with its importance.

Digital Cartography Course Outcomes: Students would be able to:

- Have knowledge about computer aided cartography.
- Prepare good quality maps.
- Take up career in the field of digital cartography.

Morphometric analysis Course Outcomes: Students would be able to:

- Learn the morphometric techniques.
- Know the types & significance of morphometry.
- Understand the usefulness of morphometric techniques in the case of a drainage basin.

Remote Sensing and GIS Course Outcomes: Students would be able to:

- Know about various aspects of aerial photogrammetry.
- Familiarize and enhance their knowledge about the Remote Sensing and GIS technology.
- Understand the technology along with application value in the Earth observation.

Geography of Transport Course Outcomes: Students would be able to:

- Understand geographic relevance of transportation.
- Familiarize about various models and theories related to transport network.
- Know about structural analysis of transport network.

Biogeography Course Outcomes: Students would be able to:

- Know about various aspects of living organisms, their relationship with climate and physical environment.
- Familiarize with interface between biology, ecology and geography.
- Familiarize with converging and forming our biosphere.

Political Geography Course Outcomes: Students would be able to:

- Learn key concepts like state, nation and nationalism.
- Understand the changing nature of modern state, challenges it is facing.
- Know the linkages of space and politics at the local level.

Social Geography Course Outcomes: Students would be able to:

- Understand the development of society and different social groups in India.
- Know the theoretical, philosophical and conceptual base of social geography.
- Understand the basic concepts of society in geographical perspectives.

Hydrology Course Outcomes: Students would be able to:

- Make better understanding about different physical aspects of water as a natural resource.
- Understand different state of water occurrence.
- Have better understanding of water distribution and circulation.

Oceanography Course Outcomes: Students would be able to:

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

Field Work Course Outcomes: Students would be able to:

- Understand the basic socio-economic characteristics of the chosen area
- Understand the field methods/techniques to do research work.
- Build the capability of writing a report.

GIS Course Outcomes: Students would be able to:

- Know the basics of Geographic Information System.
- Use geographic information in a systematic manner by the creation and updating of maps.
- Understand the representation of earth surface features with the help of maps by GIS techniques.

Geographical Thought Course Outcomes: Students would be able to:

- Acquaint with the philosophy, methodology and historical development of geography as a professional field.
- Address the spirit and purpose of the changing geographies and to what we as geographers contribute towards knowledge production.
- Critically look at the contents of other courses at Postgraduate level as logically integrated with the broad currents of thought the subject has witnessed in the distant and recent past.

Research Methodology Course Outcomes: Students would be able to:

- Formulate research questions
- Understand advantages and disadvantages of quantitative and qualitative approaches.
- Write a research proposal.

Geography of Tourism Course Outcomes: Students would be able to:

- Understand the basic concepts of tourism.
- Know regional dimensions of tourism in India.
- Have close insight to tourism in our own country.

Population Geography Course Outcomes: Students would be able to:

- Know about spatial distribution of population with causative factors.
- Learn with various theories and concepts related with population.
- Understand the distribution, dynamics of population distribution, its problems and management.

Aerial Photographs and Its Interpretation Course Outcomes: Students would be able to:

- Learn air photo interpretation techniques.
- Understand the usefulness of air photo interpretation techniques in geography.
- Enhance the knowledge about the applications of aerial photographs in various fields of geography.

Satellite Images and Its Interpretation Course Outcomes: Students would be able to:

- Understand the different kinds of satellite image interpretation.
- Create information about earth surface features from variety of satellite images.
- Know the mapping of information from satellite images.

Program Outcome and Course Specific Outcomes B.A. (Hindi)

On completion of B.A (Hindi), Students are able to:

- To understand the basic concept and subject of Hindi & its origin
- To make or not the importance of subject Hindi & its Branches.
- To understand various aspect of Hindi literature with a process to reach method and giving new mode and direction
- To make a attempt in different area and theory such as vocabulary and vice versa
- To understand in the Literature more in a border areas then Mary confined to subject.
- To know about Hindi literature its roots cause perspectives and methods.
- Elaborating and understanding its philosophical methods of Hindi Literature.
- Evaluating the concept of Hindi from past to present and making the society more closely through literature.

Programme outcomes and course outcomes B.A. English

- Educate students in both the artistry and utility of the English language through the study of literature and other contemporary forms of culture. Provide students with the critical faculties necessary in an academic environment, on the job, and in
- An increasingly complex, interdependent world. Graduate students who are capable of performing research, analysis, and criticism of literary and cultural texts from different historical periods and genres. o Assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning.
- Students should be familiar with representative literary and cultural texts within a significant number of historical, geographical, and cultural contexts. Students should be able to apply critical and theoretical approaches to the reading and analysis of literary and cultural texts in multiple genres.
- Students should be able to identify, analyze, interpret and describe the critical ideas, values, and themes that appear in literary and cultural texts and understand the way these ideas, values, and themes inform and impact culture and society, both now and in the past. o Students should be able to write analytically in a variety of formats, including essays, research papers, reflective writing, and critical reviews of secondary sources.
- Students should be able to ethically gather, understand, evaluate and synthesize information from a variety of written and electronic sources.
- Students should be able to understand the process of communicating and interpreting human experiences through literary representation using historical contexts and disciplinary methodologies.

B.A. in Political Science – Program Outcome and course outcomes

- Understand and follow changes in patterns of political behavior, ideas and structures.
- Develop the ability to make logical inferences about social and political issues on the basis of comparative and historical knowledge.

B.A. in History - Program Outcome and course outcomes

- Student will demonstrate knowledge of the chronology, narrative, majorevents, personalities and Turing points of the history of united states, Europe, and at least one non western area
- Student will offer multi –causal explanations of major historical developments based on a contextualized analysis of interrelated political, social, economic, cultural, and intellectual processes.
- Student will correctly extract evidence from primary sources by analyzing and evaluating them in reaction on their cultural and historical context and use that evidence to build and support an argument.

B.Com courses- Program Outcome and course outcomes

- Student will be able to demonstrate progressive learning of various tax issues and tax forms related to individuals. Student will be able to demonstrate knowledge in setting up computerized set of accounting book.
- Student will be demonstrating progressive affective domain development of values. the role of accounting in society and business.
- Student will learn relevant financial accounting career skills applying both quantitative and qualitative knowledge to their force career in business.
- Learners will be able to prove proficiency with the ability to engage in competitive exams and other courses.

B.Sc. courses- Program Outcome and course outcomes

B.Sc. in Physics - Program Outcomes

The Board of Studies in Physics (UG) recognizes that curriculum, course content and assessment of scholastic achievement play complementary roles in shaping education. The committee is of the view that assessment should support and encourage the broad instructional goals such as basic knowledge of the discipline of Physics including phenomenology, theories and techniques, concepts and general principles. This should also support the ability to ask physical questions and to obtain solutions to physical questions by use of qualitative and quantitative reasoning and by experimental investigation. The important student attributes including appreciation of the physical world and the discipline of Physics, curiosity, creativity and reasoned skepticism and understanding links of Physics to other disciplines and to societal issues should gave encouragement. With this in mind, we aim to provide a firm foundation in every aspect of Physics and to explain a broad spectrum of modern trends in physics and to develop experimental, computational and mathematics skills of students.

The program also aims to develop the following abilities:

1. Read, understand and interpret physical information – verbal, mathematical and graphical.
2. Impart skills required to gather information from resources and use them.
3. To give need based education in physics of the highest quality at the undergraduate level.
4. Offer courses to the choice of the students.
5. Perform experiments and interpret the results of observation, including making an

B Sc Program in Physics, an assessment of experimental uncertainties.

6. Provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.
7. Use Information Communication Technology to gather knowledge at will.
8. Attract outstanding students from all backgrounds.

Objectives: The syllabi are framed in such a way that it bridges the gap between the plus two and post graduate levels of Physics by providing a more complete and logical framework in almost all areas of basic Physics.

By the end of the first year (2nd semester), the students should have attained a common level in basic mechanics, a secure foundation in mathematics, Chemistry(otherwise specified), Languages and other relevant subjects to complement the core for their future courses and developed their experimental and data analysis skills through experiments at laboratories.
By the end of the second year (4thsemester), the students should have been introduced to powerful tools for tackling a wide range of topics in Optics, Laser, Fiber optics, semiconductor devices and circuits. Along with Languages, they should have been familiar with additional relevant techniques in mathematics, Chemistry or Electronics/Computer application and developed their experimental and data analysis skills through a wide range of experiments through practical at laboratories.
By the end of the third year (6th semester), the students should have developed their understanding of core Physics by covering a range of topics in almost all areas of physics including Classical and Quantum Mechanics, Electricity and Electrodynamics,
Relativity and spectroscopy, Thermal and Statistical Physics, Nuclear and Particle physics, Solid State Physics, Digital Electronics etc. along with one choice based courses, Open course and had experience of independent work such as projects; seminars etc. and thereby developing their experimental skills through a series of experiments which also illustrate major themes of the lecture courses.

B.Sc. in Chemistry - Program Outcomes

At the completion of B.Sc. in Chemistry the students are able to:
After completion of degree, students gained the theoretical as well as practical knowledge of handling chemicals. Also they expand the knowledge available opportunities related to chemistry in the government services through public service commission particularly in the field of food safety, health inspector, pharmacist etc. Afford a broad foundation in chemistry that stresses scientific reasoning and analytical problem solving with a molecular perspective. Achieve the skills required to succeed in graduate school, professional school and the chemical industry like cement industries, agro product, Paint industries, Rubber industries, Petrochemical industries, Food processing industries, Fertilizer industries etc. Got exposures of a breadth of experimental techniques using modern instrumentation. Understand the importance of the elements in the periodic table including their physical and chemical nature and role in the daily life. Understand the concept of chemistry to inter relate and interact to the other subject like mathematics, physics, biological science etc. Learn the laboratory skills and safely to transfer and interpret knowledge entirely in the working environment.
a. Creating interest in environmental issue.
b. Increasing working knowledge of instruments.
c. Obtaining the knowledge of pharmaceutical tables
d. Social awareness about the quality of water.
e. Increasing the practical skill of the students
f. Awareness about plastic garbage.

B.Sc. in Mathematics- Program Outcomes

Programme Specific Outcome of B.Sc. in Mathematics
• Think in a critical manner.
• Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
• Formulate and develop mathematical arguments in a logical manner.
• Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.

• Understand, formulate and use quantitative models arising in social science, business and other contexts.

Course Outcome of B. Sc. Mathematics

Course Outcome of Analytical Geometry 3D and Vector Calculus Students will able to

• Describe the various forms of equation of a plane, straight line, Sphere, Cone and Cylinder.
• Find the angle between planes, Bisector planes, Perpendicular distance from a point to a plane, Image of a line on a plane, Intersection of two lines
• Define coplanar lines and illustrate
• Compute the angle between a line and a plane, length of perpendicular from a point to a line
• Define skew lines
• Calculate the Shortest distance between two skew lines
• Find and interpret the gradient curl, divergence for a function at a given point.
• Interpret line, surface and volume integrals
• Evaluate integrals by using Green's Theorem, Stokes theorem, Gauss's Theorem Course

Outcome of Theory of Equation, Theory of Numbers and Inequalities Students will able to

• Describe the relation between roots and coefficients
• Find the sum of the power of the roots of an equation using Newton's Method.
• Transform the equation through roots multiplied by a given number, increase the roots, decrease the roots, removal of terms
• Solve the reciprocal equations.
• Analyse the location and describe the nature of the roots of an equation.
• Obtain integral roots of an equation by using Newton's Method.
• Compute a real root of an equation by Horner's method.
• Illustrate the Division and Euclidean Algorithm
• Describe the properties of prime numbers
• Show that every positive integer can be expressed as product of prime power in unique way
• Write a formula for the number of positive integers less than n that are relatively prime to n
• Define congruence and describe the properties of congruences
• Find the Sum, product of all the divisors of N.
• Find the smallest number with N divisors.
• Solve the system of linear congruences
• State Chinese Remainder Theorem, Fermat's and Wilson's theorem
• Prove that Arithmetic Mean > Geometric Mean
• Prove some simple inequalities by using AM>GM
• State and Prove Weirstrass, Schwartz's inequality.

Course Outcome of Complex Analysis Students will able to

• Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers.
• Calculate exponentials and integral powers of complex numbers.
• Write equation of straight line, circle in complex form
• Define reflection points, concyclic points, inverse points
• Understand the significance of differentiability for complex functions and be familiar with the Cauchy-Riemann equations.
• Determine whether a given function is analytic.
• Define Bilinear transformation, cross ratio, fixed point.
• Write the bilinear transformation which maps real line to real line, unit circle to unit circle, real line to unit circle.
• Find parameterizations of curves, and compute complex line integrals directly.
• Use Cauchy's integral theorem and formula to compute line integrals.
• Represent functions as Taylor, power and Laurent series.
• Classify singularities and poles.
• Find residues and evaluate complex integrals, real integrals using the residue theorem.

Course Outcome of Modern Analysis Students will able to

- Define countable, uncountable sets
- Write Holders and Minkowski inequality
- Define and recognize the concept of metric spaces, open sets, closed sets, limit points, interior point.
- Define and Illustrate the concept of completeness
- Determine the continuity of a function at a point and on a set.
- Differentiate the concept of continuity and uniform continuity
- Define connectedness
- Describe the connected subset of R.
- Define compactness
- Characterize the concept of compactness in metric space.
- Construct rigorous mathematical proofs of basic results in modern analysis

Course Outcome of Statics Students will able to

- Define Resultant, Component of a Force, Coplanar forces, like and unlike parallel forces, Moment of a force and Couple with examples.
- Prove the Parallelogram of Forces, Triangle of Forces, Converse of the Triangle of Forces, Polygon of Forces, Lami's Theorem, Varignon's theorem of moments.
- Find the resultant of coplanar couples, equilibrium of couples and the equation to the line of action of the resultant.
- Discuss Friction, Forces of Friction, Cone of Friction, Angle of Friction and Laws of friction.
- Define catenary and obtain the equation to the common catenary.
- Find the tension at any point and discuss the geometrical properties of a catenary.

Course Outcome of Dynamics Students will able to

- Define Projectile, impulse, impact and laws of impact.
- Prove that the path of a projectile is a parabola.
- Find the direct and oblique impact of smooth elastic spheres.
- Define Simple Hormonic Motion and find its Geometrical representation.
- Find the Composition of Simple Hormonic Motion and the differential equation of a central orbit.
- Find the law of force if the orbit is given and vice versa.

Course Outcome of Linear Algebra Students will able to

- Define Vector Space, Quotient space Direct sum, linear span and linear independence, basis and inner product.
- Discuss the linear transformations, rank, nullity.
- Find the characteristic equation, eigen values and eigen vectors of a matrix.
- Prove Cayley- Hamilton theorem, Schwartz inequality, Gramschmidt orthogonalisation process.
- Solve the system of simultaneous linear equations.

Course Outcome of Numerical Analysis Students will able to

- Define Basic concepts of operators Δ,E, ∇
- Find the difference of polynomial
- Solve problems using Newton forward formula and Newton backward formula.
- Derive Gauss's formula and Stirling formula using Newton forward formula and Newton backward formula.
- Find maxima and minima for differencial difference equation
- Derive Simpson's 1/3 ,3/8 rules using trapezoidal rule
- Find the solution of the first order and second order equation with constant coefficient
- Find the summation of series finite difference techniques
- Find the solution of ordinary differential equation of first by Euler,Taylor and Runge-Kutta methods

Course Outcome of O.R Students will able to

- Define nature and feature of Operations Research
- Find the replacement period of equipment that fails suddenly/gradually

• Define EOQ
• Find inventory decisions costs using deterministic inventory problems with no shortages /with shortages
• Find EOQ problems with price breaks
• Define CPM and PERT
• Define basic components of Network and find critical path
• Define queue charecteristics , transient and steady state
• Define Kendal notations solution of queue models (M/M/1):(∞/FIFO), (M/M/1):(N/FIFO)
• Define Two persons sum games ,maximin- minimax principle, saddle points.
• Find graphical solution of 2×n and m×2 games
• Find general solution of m×n rectangular games Course Outcome of Coding Theory Students will able to • Define basic assumption of binary codes , blocked codes .
• Define basic assumption of channel,symmetric codes ,information rate.
• Define encoding ,decoding ,CMLD and ICMLD
• Define linear codes,subspaces,scalar product andorthogonal complement.
• Define REF and RREF and parity check matrix and cosets.
• Define hamming bound and generator matrix
• Define BCH codes • Define perfect , related codes and cyclic linear codes.

Course Outcome of Mathematical Statistics Students will able to
• Define probability density function, probability distribution
• Derive mathematical expectation, binomial, poisson, normal distribution
• Solve the problems of large samples and small samples
• Discuss the moment generating functions, chi-square distribution
• Compute the analysis of variance, one way and two way classifications, Latin square design

Course Outcome of Sequence and Series Students will able to
• Define different types of sequence.
• Discuss the behaviour of the geometric sequence.
• Prove properties of convergent and divergent sequence.
• Verify the given sequence in convergent and divergent by using behaviour of Monotonic sequence.
• Prove Cauchy's first limit theorem, Cesaro's theorem, Cauchy's Second limit theorem.
• Explain subsequences and upper and lower limits of a sequence.
• Give examples for convergence, divergence and oscillating series.
• Discuss the behaviour of the geometric series.
• Prove theorems on different test of convergence and divergence of a series of positive terms.
• Verify the given series is convergent or divergent by using different test.

Course Outcome of Differential equations and its applications Students will able to
• Extract the solution of differential equations of the first order and of the first degree by variables separable, Homogeneous and Non-Homogeneous methods.
• Find a solution of differential equations of the first order and of a degree higher than the first by using methods of solvable for p, x and y.
• Compute all the solutions of second and higher order linear differential equations with constant coefficients, linear equations with variable coefficients.
• Solve simultaneous linear equations with constant coefficients and total differential equations.
• Form partial differential equations.
• Find the solution of First order partial differential equations for some standard types.
• Use inverse Laplace transform to return familiar functions
• Apply Laplace transform to solve second order linear differential equation and simultaneous linear differential equations.

Course Outcome of Graph Theory Students will able to
• Describe the origin of Graph Theory.
• Illustrate different types of graph theory.

• Explain independent sets and covering sets and some basic theorems.
• Discuss degree sequences and operations on graphs.
• Explain connectedness and components and some theorems.
• Characterize tree.
• Derive some properties of planarity and Euler's formula.
• Find chromatic number and chromatic polynomials for graphs.
• Prove Five colour theorem.
• Explain basic properties of directed graphs.

Course Outcome of Integral Calculus and Fourier Series Students will able to
• Solve Basic Integral Calculus problems.
• Explain properties of definite integrals.
• Prove reduction formulae and solve some problems by using this formulae.
• Evaluate double and triple integrals.
• Apply change variable method to find the value of double and triple integral.
• Explain properties of Beta functions.
• Derive relation between Beta and Gamma functions.
• Evaluate integrals by using Beta and Gamma functions.
• Find Fourier series expansions for given functions.
• Find Cosine and Sine series expansions for given functions.

Course Outcome of Differential Calculus and Trigonometry Students will able to
• Find Maxima and minima of function of two variables.
• Explain sub tangent and subnormal.
• Find angle of intersection of two curves.
• Find circle, radius and centre of curvature.
• Expand $\sin n\theta$, $\cos n\theta$ and $\tan n\theta$ by using Demoivre's theorem.
• Expand $\cos n\theta$, $\sin n\theta$ and $\tan n\theta$ in terms of θ.
• Define hyperbolic functions.
• Define inverse hyperbolic functions.

Course Outcome of Linear Programming Students will able to
• Define basic feasible solutions, Slack and Surplus variable.
• Explain simplex method.
• Demonstrate Big-M method
• Illustrate two phase method
• Prove dual of the dual is primal.
• Interpret dual simplex method.
• Define transportation problem.
• Find a basic feasible solution to the transportation problem by using North west corner rule, Vogel's approximation method.
• Apply Modi method to solve transportation problem.
• Illustrate Assignment problem and travelling salesman problem.

Course Outcome of Fuzzy Algebra Students will able to
• Define fuzzy sets, α-cuts, fuzzy complements.
• Discuss types of operations on fuzzy sets, t-norms, fuzzy arithmetic.
• Explain extension principle of fuzzy sets, fuzzy numbers.
• Illustrate fuzzy relations, binary fuzzy relations, fuzzy equivalence relations.
• State some applications of fuzzy sets.

Course Outcome of Ancillary mathematics I Students will able to
• Define characteristic equation of matrices and illustrate.
• State Cayley Hamilton Theorem
• Compute inverse of a matrix using Cayley – Hamilton Theorem.

• Find Eigen values and Eigen vectors of a given matrix.
• Solve equations of the first order but of higher degree solvable by dy/dx , y, x.
• Compute complementary function and particular integral of the type eax, cos ax, sin ax.
• Derive expression for sinnθ, cosnθ and tannθ, sinnθ, cosnθ
• Expand sinθ, cosθ, tanθ in powers of θ
• Define hyperbolic and inverse hyperbolic functions

Course Outcome of Ancillary Mathematics –II Students will able to
• Define Moments, Skewness and Kurtosis.
• Fit a straight line, Parabola for the given data.
• Calculate the correlation coefficient for the given data.
• Compute Rank correlation for the given data.
• Find intermediate values by using Newton's forward and backward formula and Lagrange's formula.
• Apply Laplace transform to solve differential equations
• Obtain Fourier series expansions for the given functions.
• Compute Cosine and Sine series expansions for the given functions.

Course Outcome of Statistics Students will able to
• Define Moments Skewness and Kurtosis.
• Fit a straight line.
• Calculate the correlation coefficient for the given data.
• Compute Rank correlation for the given data.
• Define attributes, consistency of data, independence of data.
• Find index numbers for the given data.
• Define Probability, Conditional probability.
• Derive Baye's theorem.

Course Outcome of Modern Algebra Students will able to
• Define subgroup, center, Normalizer of a subgroup.
• Find cycles and transpositions of a given permutations.
• Prove Lagrange's theorem ,Euler's theorem and Fermats theorem
• Define cyclic groups .
• Prove a group has no proper subgroup if it is cyclic group of prime order.
• Define normal subgroups , quotient groups and index of a subgroup.
• Define homomorphism ,kernel ofa homomorphism,isomorphism.
• Prove Cayley's theorem , the fundamental theorem of homomorphism for groups
• Define rings , zero divisors of a ring , integral domain , field and prove theorems

Principal
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