Department of Chemistry

Programme Outcomes: B. Sc Chemistry

Chemistry

Department of Chemistry	After successful completion of three year degree program in Chemistry a student should be able to;
Programme Outcomes	PO-1. Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry. PO-2. Solve the problem and also think methodically, independently and draw a logical conclusion. PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of chemical reactions. PO-4. Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community. PO-5. Find out the green route for chemical reaction for sustainable development. PO-6. To inculcate the scientific temperament in the students and outside the scientific community. PO-7. Use modern techniques, decent equipments and Chemistry software's

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Course Outcomes B.Sc .Chemistry

Class-B.Sc First year

Course	Outcomes After Completion of this Course s students will be able to ;
B.Sc. First Inorganic Chemistry	CO:1 Understand atomic structure and rules ,principle related to it.. CO:2 Know the structure and bonding in molecules and ions and predict the structure of molecules/ions. CO:3 Study the periodic elements of S block, P blocks and noble gases. CO:4 Understand the basic principles of qualitative analysis.
B.Sc. First Organic Chemistry	CO:1 Distinguish between geometrical and optical isomerism. CO:2 Learn the stereochemistry of organic compounds. CO:3 Understand the basics of organic chemistry. CO:4 Distinguish between aliphatic and aromatic hydrocarbons.
B.Sc. First Physical Chemistry	CO:1 Learns Mathematics and solves problem related to it. CO:2 Understand Gaseous state Chemistry ,Properties and laws. CO:3 Write an expression for Rate constant for first and second order equation. CO:4Solve the numerical problems On Chemical kinetics . CO: 5 Explain surface chemistry ,Liquid state chemistry, CO:6 Understand the absorption of gases by solid isotherms.
Class - B.Sc .Second Year	
Course	OUTCOMES After completion of this courses students should be able to;
B.Sc.Second year Inorganic Chemistry	CO:1 Understand chemistry of transition metal complexes. CO:2 Learn oxidation and reduction process. CO:3 Understand coordination chemistry and various theory related to it. CO:4 Study of acid –base ,non aqueous chemistry. CO:5Learn properties of Lanthanide and actinides.
B.Sc .Second year Organic Chemistry	CO:1 Understand chemistry of organic halides . CO:2 Learn nomenclature ,preparations ,properties and relative reactivity of alcohols and phenols and named reactions. CO:3 Learn structure, reactivity preparations and mechanism of named reactions of aldehydes and ketones. CO:4 Understand properties ,structure ,binding, and mechanism of named reactions of carboxylic acids. CO: Learn Chemistry of nitrogen containing organic compounds.
B.Sc. Second Year Physical Chemistry	CO:1Know the meaning of Phase, Component and degree of freedom. CO:2Realize the concept related to chemical equilibrium and phase equilibrium. CO:3Learn the thermodynamic description of exact, inexact differential and state function. CO:4 Understand thermodynamics terms and solve numerical problems related to it. CO:5 Explain different laws of thermodynamic s. CO:6 Study of photochemistry and phenomenon associated with it.

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Class B>Sc. Third year

COURSE	OUTCOMES After completion of this course students should be able to learn :
B.Sc Third year Inorganic Chemistry	CO:1 Understand nature of bonding in transition metal complexes. CO:2 Learn magnetic and electronic properties of transition metal complexes. CO:3 Get insight of organometallic chemistry. CO:4 Distinguish between hard , soft acid and bases. CO:5 Understand bioinorganic Chemistry.
B.Sc. Third year Organic Chemistry	CO:1 Study of carbohydrates: introduction of sugars.. CO:2 Understand biomolecules proteins, amino acids and nucleic acids. CO:3 Study of organometallic compounds. CO:4 Study of Synthetic dyes and synthetic polymers. CO: 5 Learn instrumentation and features applications, working of several spectroscopic techniques.
B.Sc. Third Year Physical Chemistry	CO:1 Learn the Molecular spectroscopy, Raman ,Electronic and vibrational spectroscopy and its application. CO:2Learns Postulates of quantum mechanics ,Schrodinger equations and its applications. CO:3 Understand molecular orbital theory and Huckels molecular orbital theory. CO:4 Learns about various physical properties of molecules such as dipole moment magnetic property and relationship with molecular structure. CO:5 Know the Concept of polarizability. CO: study of photochemistry its laws and phenomenon associated with it.

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Course	Course outcomes After completing course students will be able to perform :
B.Sc. First year chemistry practical	CO-1 Study the determination of Surface tension and viscosity. CO-2 Determine melting and boiling point s of various compounds. CO-3 Study the Separation of inorganic mixture. CO-4 Determine functional groups of several organic mixture. CO-5 Determine rate of esterification and kinetics of saponification. CO-6 Perform crystallization and purification of organic compounds. CO:7 Learns best practices and safety rules of laboratories.

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Chemistry practical Outcomes B.Sc. Third year	CO:1 Prepare and synthesize Various inorganic complexes and organic Compounds. CO:2 Performs binary separation of organic mixtures and analysis of compounds. CO:3 Study the gravimetric and volumetric analysis. CO:4 Study the instrumentation and performs various experiments with spectrophotometer, calorimeter, PH meter. CO:5 Learns handling of instruments.

B.Sc.Second year Chemistry practical	CO:1 Learns weighing ,solution preparation of different molarity and normality. CO:2 Performs difffernt volumetric and estimation of different types. CO:3 To understand chromatrographic separation. CO:4 Learns determination of transition temperature. CO: 5 Performs various thermochemistry experiments to understand concepts of thermochemistry. CO:6 Understand Phase equilibrium through experiments.

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M.sc. chemistry

Program specific outcome

PSO1	Gains complete knowledge about all fundamental aspects of all the element of chemistry
PSO2	Understand the background of organic reaction mechanisms, complex chemical structures ,Instrumental method of chemical analysis, molecular rearrangement s and separation techniques.
PSO3	Appreciates the importance of various elements present in the periodic table ,coordination chemistry and structure of molecules ,properties of compounds ,structure determination of complex e using theories and instruments.
PSO4	Gathers attention about the physical aspects of atomic structure, dual behaviour ,reaction pathways with respect to time ,various energy transformation ,molecular assembly in nanolevel ,significance of electrochemistry ,molecular segregation using their symmetry.
PSO5	Learns about the potential uses of analytical industrial chemistry, Medicinal chemistry, and green chemistry.
PSO6	Carry out experiments in the area of organic analysis, estimation, separation derivative process ,inorganic semi micro analysis preparation ,conductometric ,Refractometry ,spectroscopy ,Electophoresis, PH metry and potentiometric analysis.

Govt. Pt. J.L.N. Arts & Science College IQAC Bemetara (C.G.)

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COURSE OUTCOME

Course M.sc. Fourth Semester

COURSE Name –Instrumental methods of analysis

CO 1:Analysis of variations of practical errors .

CO2:Gains the potential about chromatographic separation techniques .

CO3:Validates the strength of spectrochemical Analysis. Gains insight of Atomic absorption and atomic emission spectroscopy .

CO4:Understand X-Ray induced and Proton Induced Spectroscopy.

Course M.sc. Fourth semester

COURSE name-Natural products and medicinal chemistry.

After successfully completing this course student will be able to :

CO1:Understand different secondary metabolites and their importance .

CO2:Become familiar with many reagents used in organic synthesis .

CO3:Understand nature better by studying mechanism in biological reaction .

CO4: Understand Various laboratory methods to determine structure of Unknown Organic samples .

CO5:Develop interest in Biogenesis of naturally occurring essential compounds.

Course – M.Sc. Fourth semester

COURSE name :Material and Nuclear chemistry

CO1:Understand Non equilibrium thermodynamics.

CO2: Understand nuclear reactions of basic types.

CO3: Study of nuclear reactor of various types and to understand the applications of nuclear chemistry.

CO4:Understand basic concepts Preparations, Properties and applications of **nanoparticles.**

CO5: Give insights of **Supramolecular chemistry**.

CO6: Learns the effects of radiation on human health.

Course –M.Sc. Fourth Semester

Course Name –Environmental and applied chemical analysis.

CO1:Provide basic understanding of The chemistry and functioning of the atmosphere.

CO2: Learns air monitoring and analysis methods.

CO3:Know aqnd recall the soil and water pollution ,analysis and monitoring.

CO4: Learn basic constituents of foods,preservative and additives.

CO5: Understand cosmetics ,clinical and drug analysis.

COURSE OUTCOME

Course M.sc. Fourth Semester

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DEPARTMENT OF ECONOMICS

M.A. ECONOMISC (SEMESTER) PROGRAM OUTCOME

1.To provide current and advanced knowledge about the science of economics.
2.To make the curriculum of this program that must be based on employability,and skill development .
3.Student will be able to get in-depth knowledge of fundamental economic theories.
4.The subject matter of M.A Economics programme covers the fields of Agriculture, Industry, Banking, Financial Markets, Planning and Development, Public Finance environmantal economics,International Trade and the functioning of international organisations such as World Bank International Monetary Fund, International Development Association, etc.
5. Since these are the main subject content of State Level and National Level competitive examinations, banking service,examinations and other competitive examinations the students of Economics can easily crack such examinations and can become successful in getting employment opportunities.
6. completion of PG Degree in Economics with good knowledge open up research opportunities in the national,
7. The real understanding of the subject content of M.A. Economics help in the character building of students and makes them responsible citizens. They are exposed to national and international problems and hence they will have a thorough understanding of national and international economic events

CLASS	SUBJECT	OUTCOME
M.A 1st semester	Micro Economics	Upon successful completion of this Paper the student will be able to: 1. Define Demand Theories Apply elasticity on price demand measurement. 2. Uses of various methods to implore consumer behaviors. 3. Impact of Time pattern on production process. 4. Cost & Revenue analysis in various market forms
	macro economics	Upon successful completion of this Paper the student will be able to: 1. Understand the Flow of National Income. 2. Various assessment of national income. 3. factors affecting employment and income. 4. Consumption & Investment. 5. Money and its supply and demand.
	Quantitative methods	Upon successful completion of this Paper the student will be able to: 1. To measure Skewers in data. 2. Measure relationship between economic variables. 3. Interdependence and permutation between various factors. 4. How to fine values through Extrapolation and Interpolation. 5. Time based variables and importance and construction of Index Number.
	Indian Ecoonomics	Upon successful completion of this Paper the student will be able to: 1. Component and structure of National Income. 2. Demographic features of India. 3. Agriculture and its importance in Indian economy. 4. Industrialization and initiative taken for industrialization of India. 5. Regional imbalance.
	industiral Ecoonomics	Upon successful completion of this Paper the student will be able to: 1. Firm Industry and factors affecting their location. 2. Factors affecting productivity & capacity utilization and profitability of a firm. 3. Funding of Industry and firm. 4. Labor related issues. 5. Some big industries.

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M.A 2nd semester	Micro Economics analysis	Upon successful completion of this Paper the student will be able to: 1. How a firm takes decisions to maximize its objective. 2. Determination of returns to various factors of production. 3. Welfare economics imply value judgment and assess principles of welfare. 4. Analyze economy as a whole. 5. Operational problem solution.
	Macro economics analysis	Upon successful completion of this Paper the student will be able to: 1. Understand price rise and employment inflation trade off. 2. Growth dilemmas unstable & unsteady growth. 3. Monetary policy for stability and growth. 4. Govt.'s policy and its economic implications. 5. Complexities of various monetary and fiscal measures.
	Researchmethodology and computer analysis	Upon successful completion of this Paper the student will be able to: 1. Research designs Methods to carry out researches. 2. Sampling Data collection to study and understand a problem. 3. Presentation of data. 4. Formulation of hypothesis and testing of hypothesis. 5. Uses of computer for Statistical Analysis.
	Indian Ecoonomy policy	Upon successful completion of this Paper the student will be able to: 1. Uses of planning process for growth and desired changes in Indian Economy. 2. Problem of poverty and measurs taken to remove poverty and employment generation policies. 3. Working Finance Commissions to foster centre state relation. 4. Trade Reforms and contribution of export - import in Indian economy. 5. Budget and its importance international economic associations and their importance for India.
	labour economics	Upon successful completion of this Paper the student will be able to: 1. Labour Market Interplay of forces of Labour market. 2. Employment, wage and wage determinations, role of bargaining power. 3. Formation of trade union, utility and functioning of trade union. 4. Govt. intervention in labour market.
	Economics of groth	Upon successful completion of this Paper the student will be able to: 1. Essence of economic growth, impediments to growth. 2. Measurements of Growth, Alternative discourse on Growth. 3. Perspectives of various economists on development and their formulation for speedy development. 4. Contraction in strategies of development.

M.A 3rd semeter	International trade	Upon successful completion of this Paper the student will be able to: 1. Importance of trade in economy of a nation. 2. Why does different nation trade. 3. What are conditions of trade and how these terms for trading determined. 4. Affects of trade on various macro parameters of Economy. 5. Balance of payment and measure to bring about desirable changes in international payment position of a country. 6. Determination of external value of domestic currency.
	publice finance	Upon successful completion of this Paper the student will be able to: 1. Taxation importance of taxation for Government. 2. Impact of taxes on production, consumption and distribution. 3. Changing pattern of taxation in India. 4. Different forms of taxation 5. Public expenditure and Public debt and its impact on economy. 6. Process of budget making.
	Environmental economics	Upon successful completion of this Paper the student will be able to: 1. Need to study Environment as part of Grand Economics Theory. 2. Environment as a factor in general welfare. 3. Economic welfare and its measurements. 4. Impact of Environment influencing activities on market forces of demand and supply. 5. Price calculation when Environmental influence affects market forces.
	Demography	Upon successful completion of this Paper the student will be able to: 1. Factors governing population changes in population. 2. Role of Economic forces in shaping population trend of a nation. 3. Role of population in Economic parameters of a nation. 4. Factor responsible for birth rate, death rate, infant mortality rate. 5. Economic and demographic inter linkages.
	Economics of development and planning	Upon successful completion of this Paper the student will be able to: 1. Process of Planning, Planning in India and achievements of Indian Five Year Plan. 2. Various theoretical perspectives on strategies to remove back wardress. 3. Role of Govt. and Banking System in development of a Nation. 4. International comparison on two bases of poverty, prosperity and happiness. 5. Some important macro issues and their solution.
	International economics	Upon successful completion of this Paper the student will be able to: 1. Role of bilateral and multilateral integration. 2. Various international cooperative formations and their compact on different economies. 3. International capital movement, its advantages and disadvantages. 4. Various international Institutions for general economic improvement of participating nations. 5. Impact analysis of structural reforms of 1991 on the foreign trade of India.

M.A 4th semeter		
	publice economics	Upon successful completion of this Paper the student will be able to: 1. Federal system of India. 2. Finances of States and Centre. 3. Constitutional provision to distribute resources between center and states and among states. 4. Idea of fiscal federalism. 5. Analysis of budgets of center and Chhattisgarh. 6. Fiscal analysis of Chhattisgarh.
	economics of social sector	Upon successful completion of this Paper the student will be able to: 1. Pollution, impact analysis of Pollution and causes of Pollution. 2. Various laws to protect environment. 3. Uses of various natural resources and their implications and consequences. 4. Education as an important economic variable and outcome. 5. Health as an important economic variable and outcome.
	VIVA-VOCE	1.Upon successful completion of this Paper the student will be able to: 2.Students are evaluated for their comprehensive ability to understand and explain two various economic facts of life through personal interface.

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DEPARTMENT OF ECONOMICS

B.A ECONOMISC PROGRAM OUTCOME

After successful completion of the course the students would be able to:

1. Understand the key concept of economics, theories and models.
2. Comprehend current perspectives and issue in major areas of the Indian economy and World economy.
3. Have a comprehensive knowledge of the socio-economic issues and make a critical appraisal of policy measures addressing their effectiveness.
4. Understand the relevance and application of economic theories to contemporary economic issues.
5. Prepare for advanced studies leading to M.Phil. and Ph. D in economics.
6. Equip themselves to be trained quality teachers, researches and policy makers.

CLASS	SUBJECT	OUTCOME
B.A PART I	Micro Economisc	Upon successful completion of this Paper the student will be able to: 1. Factors affecting consumer demand. 2. Production and cost matrix in output determination. 3. Various market forms and determination of prices in these markets. 4. How factor prices are determined 5. Factors of welfare as conceptualized by economist.
	indian economy	Upon successful completion of this Paper the student will be able to: 1. How Indian economy is changing toward a market based economy. 2. What are basic features of Indian Economy? 3. Planning in India and economic reform introduced and rationale behind reform. 4. Role of Industry and various policy decisions to induce industrial revolution in India. 5. Importance of foreign sector and rationale behind export promotion schemes.
B.A PART II	macro economics	Upon successful completion of this Paper the student will be able to: 1. National income and understand how it is calculated. 2. Factors responsible for employment determination. 3. Consumption and investment and their importance in national income determination. 4. Trade cycles and various factors responsible for trade cycle. 5. Export- Import and its related concepts 6. International institutions for trade and Economics.
	money banking & public finance	Upon successful completion of this Paper the student will be able to: 1. How value of money changes. 2. Inflation and measures to control inflation. 3. Banks, their role in economy and Central Banking System. 4. State and effect of its intervention in the economy. 5. Sources of various revenues to state. 6. Public debt and economics effects.

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B.A PARTIII	Developmental and . Environmental economics	Upon successful completion of this Paper the student will be able to understand: 1. Economic well being of various nations; Poverty and emerging trends to measure poverty and deprivation. 2. Population and Economy linkage, various perspective developments. 3. Environment, importance of study of Environment Economy and sustainable development. 4. Various socio- economic issues affecting mankind.
	Statistical Mathods	Upon successful completion of this Paper the student will be able to: 1. Statistics, data collection 2. Measurement of representative values. 3. Easement of various representative values. 4. Inter-relationship between social and economic variables. 5. Construction of Index numbers and Measurement of trend

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Department Of Mathematics

Program Outcomes/ Program Specific Outcomes

S. No.	ProgramName	Outcomes
1	M.Sc.(Mathematics)	**Program Outcomes** **PO1** Pursue research in reputed institutions and solve the existing mathematical problems using the knowledge of pure and applied mathematics. **PO2** Acquire the strong foundation of basic concepts which will benefit them to become good academicians. **PO3** Apply the concept of mathematical tools to address real life problems **PO4** Gain the knowledge of software which will be useful in Industry **PO5** Qualify various competitive exams like CSIR-UGC NET, SET, GATE, MPSC, UPSC, Etc **PO6** Inculcate critical thinking to carry out scientific investigation objectively without being biased with preconceived notions. **PO7** Equip the student with skills to analyze problems, formulate an hypothesis, evaluate and validate results, and draw reasonable conclusions thereof. **PO8** Prepare students for pursuing research or careers in industry in mathematical sciences and allied fields **PO9** Imbibe effective scientific and/or technical communication in both oral and writing. **PO10** Continue to acquire relevant knowledge and skills appropriate to professional activities and demonstrate highest standards of ethical issues in mathematical sciences. **PO11** Create awareness to become an enlightened citizen with commitment to deliver one's responsibilities within the scope of bestowed rights and privileges.
		Program Specific Outcomes **PSO1** Understanding of the fundamental axioms in mathematics and capability of developing ideas based on them. Inculcate mathematical reasoning. **PSO2** Prepare and motivate students for research studies in mathematics and related fields.

		PSO3 Provide knowledge of a wide range of mathematical techniques and application of mathematical methods/tools in other scientific and engineering domains. **PSO4** Provide advanced knowledge on topics in pure mathematics, empowering the students to pursue higher degrees at reputed academic institutions. **PSO5** Strong foundation on algebraic topology and representation theory which have strong links and application in theoretical physics, in particular string theory. **PSO6** Nurture problem solving skills, thinking, creativity through assignments, project work. **PSO7** Assist students in preparing (personal guidance, books) for competitive exams e.g. NET, GATE, etc. **PSO8** To imbibe problem-solving and computational skills **PSO9** To understand the motivation behind the statements and proofs **PSO10** To enhance self learning and improve own performance. **PSO11** To inculcate abstract mathematical thinking.
2	**B.Sc.(Mathematics)**	Program Outcomes **PO1** Be able to analyze, test, interpret and form independent judgments in both academic and non-academic contexts **PO2** Recognize and appreciate the connections between theory and applications **PO3** Have an appropriate set of professional skills to ensure a productive career **PO4** Work effectively in a multi-disciplinary environment **PO5** Be prepared for life-long learning **PO6** Exhibit positive attitudes and values toward the discipline, so that they can contribute to an increasingly complex and dynamic society **PO7** Develop effective communication skills in English and regional / national language **PO8** Communicate effectively with whom they are interacting and the society to make effective presentations, and give and receive clear instructions **PO9** Function effectively as an individual, and as a member or leader in diverse teams Program Specific Outcomes **PSO1** Be familiar with different areas of Mathematics **PSO2** Construct abstract models using appropriate mathematical and statistical tools **PSO3** Be prepared to use Mathematics, not only in the discipline of Mathematics, but also in

		other disciplines and in their future endeavors **PSO4** Recognize what constitutes mathematical thinking, including the ability to produce and judge the validity of rigorous mathematical arguments **PSO5** Identify suitable existing methods of analysis, if any, and assess his/her strengths and weaknesses in the context of the problem being considered **PSO6** Develop the skills necessary to formulate and understand proofs and to provide justification **PSO7** Think critically and communicate clearly mathematical concepts and solutions to real-world problems **PSO8** Be able to solve problems using a broad range of significant mathematical techniques **PSO9** Engage his/her creativity in the quest for novel or elegant solutions **PSO10** Develop an understanding of the precise language of Mathematics, and be able to integrate mathematical arguments with their critical thinking skills **PSO11** Be a life-long learner who is able to independently expand his/her mathematical or statistical expertise when needed

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Department Of Mathematics

Course Outcomes

Program - M.Sc. Mathematics		
S. No.	**Course Name**	**Course Outcomes**
1	**Advanced Abstract Algebra**	**CO1** Understand basic notions in the theory of field extensions **CO2** Apply the theorems of algebraic extensions, splitting fields, separable and inseparable. Extensions to find the various examples of extensions. **CO3** Relate the group theory and Galois theory in finding the Galois extension and Galois group.
2	**Advanced Complex Analysis**	**CO1** Understanding of topological and geometric properties of the complex plane. **CO2** Differentiation and integration of functions on C0mplex plane, with applications to problems from real analysis. **CO3** Viewing analytic functions as conformal mappings. **CO4** Evaluation of indefinite real integrals using complex analysis. **CO5** Constructing Mobius transformations mapping given circles to given circles. **CO6** Recognize the concept of limits, continuity, Differentiability and analytic function **CO7** Test the analyticity of a given function. **CO8** Prove the Abel's theorem and Cauchy's Theorems. **CO9** Discuss linear transformation, singularities, types of singularities and Residues. **CO10** Prove the local mapping theorem, maximum modulus principle, Residue theorem. **CO11** Evaluate the integral using Cauchy's integral formula and Residue theorem. **CO12** Find the Taylor's and Laurent's series expansion of given function **CO13** equip with necessary knowledge and skills to enable them handle mathematical operations,analyses and problem solving involving complex numbers. **CO14** understanding of topological and geometric properties of the complex plane **CO15** analyze how complex numbers provide a satisfying extension of the real numbers

		CO16 learn techniques of complex analysis that make practical problems easy (e.g. graphical rotation and scaling as an example of complex multiplication); **CO17** continue to develop proof techniques.
3	**Topology**	**CO1** Knowledge gained of Connectedness, compactness, separation axioms. **CO2** Generalization of concepts like continuity. **CO3** Generalizations of theorems. **CO4** Distinguishing spaces up to homeomorphisms. **CO5** Understanding of topological spaces and having a grasp on basic results. **CO6** Define topological spaces, product topology, metric topology, quotient space. **CO7** Discuss the continuous functions, connected space, compact space, complete metric space, related theorems on Baire space. **CO8** Describe closed sets and limit points, components and path components. **CO9** Prove Urysohn's lemma, Urysohn's metrization theorem, Nagata-Snirnov metrization theorem, Ascoli's theorem. **CO10** Understand the separation axiom, a space filling curve.
4	**Advanced Discrete Mathematics**	**CO1** More advance topics in combinatorics: recurrence relations, generating functions, graphs, trees, topics in matching such as Marriage theorem. **CO2** Application to real life problems such as network theory, optimization etc. **CO3** Ability to deal with notions of mapping and via that notion ability to tackle various notions of infinity like countable, uncountable etc. **CO4** Ability to use graphs as unifying theme for various combinatorial problems. **CO5** Ability to apply combinatorial intuitions in network theory, data structure and various other fields of science. **CO6** Define Semigroups, Monoids, Homomorphism and Isomorphism. **CO7** Describe the TF statements, connectives, atomic and compound statements. **CO8** Illustrate Tautology, Tautological implication, Truth Tables, Normal Forms, Principal Normal Forms. **CO9** Discuss the theory of inference, quantifiers, predicate calculus. **CO10** Interpret Lattices, Boolean Algebra, Karnaugh Map, Switching Circuits.
5	**Advanced Real Analysis**	**CO1** Apply the knowledge of concepts of real analysis in order to study theoretical development of different mathematical techniques and their applications. **CO2** Understand the nature of abstract mathematics and explore the concepts in further

		details. **CO3** Identify challenging problems in real variable theory and find their appropriate solutions. **CO4** Deal with axiomatic structure of metric spaces and generalize the concepts of sequences and series, and continuous functions in metric spaces. **CO5** Use theory of Riemann-Stieltjes integral in solving definite integrals arising in different fields of science and engineering. **CO6** Extend their knowledge of real variable theory for further exploration of the subject for going into research. **CO7** Understand basic theorem on lebesgue measure **CO8** Understand basic theory of measurable set, m"ble functions, measurability **CO9** Determine the Riemann integrability
6	**Fuzzy Set Theory & Its Application**	**CO1** Use the fuzzy set theory on the statistical method which is given. **CO2** Analyze statistical data by using fuzzy logic methods. **CO3** Compare statistical methods against fuzzy logic methods. **CO4** Get theory of the statistic's fuzzy logic theory together. **CO5** Evaluate fuzzy statistics applications. **CO6** Find crisp sets and fuzzy sets and discuss the types of fuzzy sets. **CO7** Classify the operations on fuzzy sets. **CO8** Illustrate fuzzy relation. **CO9** Explain fuzzy measures and classify possibility and necessity measures **CO10** Determine decision making in fuzzy environments and solve the corresponding L.P.P by simplex method
7	**Graph Theory**	**CO1** Use definitions in graph theory to identify and construct examples and to distinguish examples from non-example. **CO2** Apply theories and concepts to test and validate intuition and independent mathematical thinking in problem solving. **CO3** Integrate core theoretical knowledge of graph theory to solve problems. **CO4** Reason from definitions to construct mathematical proofs **CO5** Evaluate and synthesize published research papers. **CO6** Analyze new networks using the main concepts of graph theory. **CO7** Define Euler Tours and Hamiltonian cycles and prove related theorems.

		CO8 Explain Matchings and edge colouring. **CO9** Define edge chromatic number and some properties are proved. **CO10** Define independent sets and cliques and prove related theorems. **CO11** Define vertex colouring and prove theorems on vertex colouring. **CO12** Derive properties of planarity and Euler's formula. **CO13** Prove Five colour theorem.
8	**Partial Differential Equation and Mechanics**	**CO1** Understand the concept of functional and determine stationary paths of a functional to deduce the differential equation for stationary paths. **CO2** Use Euler-Lagrange equation to find stationary paths and its applications in some classical fundamental problems. **CO3** Define and understand basic mechanical concepts related to discrete and continuous mechanical systems. **CO4** describe and understand the motion of a mechanical system using Lagrange Hamilton formalism. **CO5** Connect concepts and mathematical rigor in order to enhance understanding. **CO6** Understand the formation and solution of some significant PDEs like wave equation,and heat equation
9	**Operations Research**	**CO1** Apply the knowledge of basic optimization techniques in order to get best possible results from a set of several possible solution of different problems viz. linear programming problems, transportation problem, assignment problem and unconstrained and constrained problems etc. **CO2** Formulate an optimization problem from its physical consideration. **CO3** Select and implement an appropriate optimization technique keeping in mind its limitations in order to solve a particular optimization problem. **CO4** Understand theoretical foundation and implementation of similar type optimization techniques available in the scientific literature. **CO5** Continue to acquire knowledge and skills of optimization techniques that are appropriate to professional activities **CO6** Extend their knowledge of basic optimization techniques to do interesting research work on these types of optimization techniques.
10	**Functional Analysis and Integration Theory**	**CO1** Investigating the best approximation of a given vector by vectors in a given subspace. **CO2** Computing the dual spaces of certain Banach spaces.

		CO3 Working with weak and weak topologies on normed linear spaces. **CO4** Comparing the differences between Banach and Hilbert spaces. **CO5** Analyzing the structure of the spectrum of certain operators. **CO6** Utilize the concepts of functional analysis, for example continuous and bounded operators, normed spaces, Hilbert spaces and to study the behavior of different mathematical expressions arising in science and engineering. **CO7** Understand and apply fundamental theorems from the theory of normed and Banach spaces including the Hahn-Banach theorem, the open mapping theorem, the closed graph theorem and uniform boundedness theorem. **CO8** Understand the nature of abstract mathematics and explore the concepts in further details. **CO9** Explain the concept of projection on Hilbert and Banach spaces.

Program - B.Sc. Mathematics

S. No.	Course Name	Course Outcomes
1	**Vector Calculus & Geometry**	**CO1** acquire the basic knowledge of vector differentiation and vector integration **CO2** Determine and apply, the important quantities associated with scalar fields, such as partial derivatives of all orders, the gradient vector and directional derivative **CO3** Determine and apply, the important quantities associated with vector fields such as the divergence, curl, and scalar potential **CO4** Calculate line integrals along piecewise smooth paths; interpret such quantities as work done by a force **CO5** Evaluate line, surface, double and triple integrals and use these integrals to verify the seminal integral theorems (Green's theorem in the plane, Gauss' divergence theorem and Stokes' theorem) **CO6** Apply vector algebra techniques to analyze problems involving two and three dimensional entities –lines, curves, planes and surfaces **CO7** Use Green's theorem to evaluate line integrals along simple closed contours on the plane

		CO8 Compute the curl and the divergence of vector fields **CO9** Employ the techniques of the higher dimensional differential calculus in problems of physical interest **CO10** Compute the area of parametric surfaces in 3-dimensional space **CO11** Apply Stokes' theorem to compute line integrals along the boundary of a surface **CO12** Use Stokes' theorem to give a physical interpretation of the curl of a vector field **CO13** Use the divergence theorem to give a physical interpretation of the divergence of a vector field **CO14** Analyze the structure and nature of surfaces
2	**Advanced Calculus**	**CO1** Acquire the concept of finding partial derivatives and associated rules **CO2** Develop competency in applying the idea of partial derivatives **CO3** Acquire the basic ideas of double and triple integral **CO4** Apply the techniques of double and triple integral to various problems of finding length of plane curves, surface areas and volumes of surfaces of revolution **CO5** Change variables in multiple integrals **CO6** Familiarized with different three dimensional surfaces and their properties **CO7** Develop skill in finding the partial derivatives of functions of several variables and various rules associated **CO8** Apply the chain rule for functions of several variables **CO9** Use the Lagrange multiplier method to find extrema of functions with constraints **CO10** Apply the knowledge of Lagrange multipliers in finding the extreme values of functions **CO11** Make a comparative study of the extreme values of functions of a single independent variable with functions of several independent variable
3	**Mechanics**	**CO1** Define Resultant, Component of a Force, Coplanar forces, like and unlike parallel forces, Moment of a force and Couple with examples. **CO2** 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. **CO3** Find the resultant of coplanar couples, equilibrium of couples and the equation to the line of action of the resultant. **CO4** Discuss Friction, Forces of Friction, Cone of Friction, Angle of Friction and Laws of friction.

		CO5 Define catenary and obtain the equation to the common catenary. **CO6** Find the tension at any point and discuss the geometrical properties of a catenary. **CO7** Define Projectile, impulse, impact and laws of impact and prove that the path of a projectile is a parabola. **CO8** Define Simple Hormonic Motion and find its Geometrical representation and find the Composition of Simple Hormonic Motion and the differential equation of a central orbit.
4	**Calculus**	**CO1** define the basic concepts and principles of differential and integral calculus of real functions and sequences and series **CO2** interpret the geometric meaning of differential and integral calculus **CO3** apply the concept and principles of differential and integral calculus to solve geometric and physical problems **CO4** organize solving of complex problems by combining the acquired mathematical concepts and Principles **CO5** Expand functions using Taylor's and Maclaurin's series, Leibnitz theorem and use their applications **CO6** Acquire the concept of asymptotes and envelopes **CO7** Extract the solution of differential equations of the first order and of the first degree by variables separable, Homogeneous and Non-Homogeneous methods. **CO8** 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. **CO9** Solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases. **CO7** Able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution. **CO8** Introduced to the complete solution of a nonhomogeneous differential equation with constant coefficients by the method of undetermined coefficients. **CO9** Able to find the complete solution of a differential equation with constant coefficients by variation of parameters. **CO10** Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.

5	**Differential equations**	**CO1** Form partial differential equations and find the solution of First order partial differential equations for some standard types. **CO2** Use inverse Laplace transform to return familiar functions and apply Laplace transform to solve second order linear differential equation and simultaneous linear differential equation. **CO3** Apply various power series methods to obtain series solutions of differential equations. **CO4** Compute all the solutions of second and higher order partial differential equations with constant coefficients **CO5** Understand the concept of functional **CO6** Understand the concept and applications of eigen value problems. **CO7** Understand differential equations of Strum Liouville type.
6	**Algebra and Trigonometry**	**CO1** solve the system of homogeneous and non homogeneous linear equations by using concept of rank of matrix, finding eigen values and eigen vectors. **CO2** Understand the qualitative analysis of systems of linear equations. **CO3** Use of De-Moivre's theorem **CO4** Understand the basics of group theory **CO5** Solve cubic and biquadratic equation
7	**Discrete Mathematics**	**CO1** Basic set theory, cardinal numbers, different concepts of infinity. **CO2** Basic combinatorics, induction, inclusion exclusion, pigeon hole principle. **CO3** More advance topics in combinatorics: recurrence relations, generating functions, graphs, trees, planar graph **CO4** Describe the TF statements, connectives, atomic and compound statements. **CO5** Illustrate Tautology, Tautological implication, Truth Tables, Normal Forms, Principal Normal Forms. **CO6** Interpret Lattices, Boolean Algebra, Switching Circuits. **CO7** Understand the language and grammer **CO8** Use of finite state machine as language recognizers
8	**Analysis**	**CO1** Apply the fundamental concepts of Fourier series,Fourier Sine series, Fourier Cosine series to find series representation of irrational numbers. **CO2** Learn the basic abstract ideas of analysis **CO3** Learn the basic ideas open sets, closed sets, limit point, isolated points, boundary

		points, subspace, product metric spaces and apply them to study the nature of sets. **CO4** Leran the theorems on completeness, compactness,connectedness and use them to solve the problems.identify the continuity of a function which is defined on metric spaces, at a given point and identify the set of points on which a function is continuous by using different theorems. **CO5** Learn about analytic functions, Cauchy-Riemann differential equations, harmonic functions Mobius transformations. **CO6** Learn about Rimann integral **CO7** Ability to test the convergence of improper integrals.
9	**Abstract Algebra**	**CO1** Introduction to vector space and subspace. **CO2** Use the concept of basis and dimension of vector spaces linear dependence and linear independence,to solve problems. **CO3** Use the concept of inner product spaces to find norm of vectors, distance between vectors, check the orthogonality of vectors, to find the orthogonal and orthonormal basis. **CO4** Apply the properties of linear transformations to linearity of transformations, kernel and rank of linear transformations, inverse transformations to solve the problems of matrix transformations, change of basis. **CO5** Identify the concept of Normal groups and Quotients groups. **CO6** Analyze Permutation groups and Counting principle. **CO7** Explain Sylow theorem and its applications. **CO8** Use the concept of isomorphism and homomorphism for rings **CO9** Provide information on ideals and Quotient rings, Field of Quotient of an integral domain. **CO10** Concentrate on a particular Euclidean ring and other forms of Polynomial rings.

GOVT. PT.J.L.N.ARTS & SCIENCE PG COLLEGE BEMETARA

DEPARTMENT OF COMMERCE

B.COM PROGRAM OUTCOME (PO2):is expected to achieve following outcomes

1. To develop a thorough understanding of Accounts and financial functions of an organization.
2. To develop quality leadership in financial area.
3. To collate and integrate systems of Accounts and finance.
4. To encourage the students to undertake higher studies and research in commerce and allied disciplines.
5. To communicate and share their ideas with industry effectively and efficiently.
6. To be able to work at individual as well as team level in accounting area.
7. To become proficient in using information technology and accounting tools in decision making process.
8. To develop a strong platform of commerce activities.
9. To students enabled themselves applying for deferent examination like PSC, UPSC, SET, NET extra.

COURSE OUTCOME :

CLASS	SUBJECT	OUTCOME
B.COM PART I	FINANCIAL ACCOUNTING	1. To learn principles and concepts of accountancy. 2. To Understand the basic concepts and conventions of accounting. 3. To explain the application of accounts in sole trader, chances of errors and rectification. 4. To Write up the accounting for partnership firm , admission and dissolution of partnership firm 5. To Write up the Receipts and Payments, Income and Expenditure Account and Balances Sheet. 6. To understand the concept of Branch account.
	BUSINESS MATHEMATICS	1. To enable the students to learn mathematics for Business. 2. To make them understand the concept of Profit & loss, Simple Interest and Compound Interest for business. 3. To understand the application of Average, Ratio and Proportion and Percentage. 4. To describe matrix concept and linear equations in two variables. 5. To understand the logarithm and its laws of addition, subtraction, multiplication and division.
	BUSINESS ENVIRONMENT	1. Students get an insight into meaning of business environment and its components 2. To familiarize the students by the concept of Savings, Investment and Expenditure. 3. To gave an insight to the New Industrial Policy .

		4. To familiarize with Economic System & its types. 5. To enable the students to analyze Positive and Negative impact of Liberalization, Privatization and Globalization in Indian economy. 6. To describe implication of Deficit Financing, Disinvestment of Public enterprises and Demonetization etc. in Indian Economy.
B.COM PART I	ENVIRONMENTAL SCIENCE	1. Students learn the Concept of Sustainability and its development 2. Significance of Ecosystems, Case Studies on Ecosystems, Natural resources are covered. 3. Biodiversity levels, Threats to biodiversity, Ecosystem and bio diversity services are covered. 4. Environmental Pollution, Environmental Policies & Practices, Case Studies on pollution are covered. 5. Environmental Movements, Ethics, Communication and Public awareness are being taught with corresponding filed work.
	BUSINESS ECONOMICS	1. Students learn and understand the economic theory. 2. Students know the significance the demand analysis and Elasticity of demand. 3. They have clear knowledge on production functions. 4. To Elucidate the Pricing Methods and Policies. 5. To understand the various price theories.
	BUSINESS REGULATORY FRAMEWORK	1. Students understand the essential elements of valid contract. 2. Students learn the law relating to Minor, Unsound Mind and persons disqualified by law. 3. Students understand the modes of performance and discharge. 4. Students have clear understanding about contract of indemnity and guarantee. 5. They will learn the significance of explain the sale of goods act and consumer protection act.
	BUSINESS COMMUNICATIONS	1. Students make effective and impressive communication. 2. Students make communication in ethical manner. 3. Capable to make persuasive digital communication. 4. Capable to make abstract & summaries of proposals. 5. Better presentation and communication using proper body language.
B.COM PART II	CORPORATE ACCOUNTING	1. Students Understand regarding issues of shares, types of share capital, forfeiture, reissue and pro rate allotment of shares 2. To make them understand the redemption of preference shares 3. Students understand debentures and redemption of debenture process 4. They l learn the final accounts of companies. 5. To illustrate the valuation of goodwill and shares.

		6. To explain the concept of Holding Companies 7. They learn about the Amalgamation, Absorption, Internal & External Reconstruction. 8. To make out the Liquidation of Companies.
B.COM PART II	**BUSINESS STATISTICS**	1. To make students learn the statistical methods and their applications in commerce. 2. Students learn the concept of statistics, primary and secondary data, diagrammatic, graphical Presentation. 3. To describe measures of dispersion, deviation and skewers. 4. To make them understand the concept of correlation, co-efficient of correlation. 5. To define time series, methods of estimating strand, index numbers. 6. To explain the concept of probability and its implication in business
	COST ACCOUNTING	1. To make students learn the concept, scope and classification of Cost Accounting. 2. Material, labor and overhead accounting treatment & Methods 3. To learn the System of Wage Payment under Helsey, Rowan and other methods 4. Write up the process costing and different types of losses 5. To understand the operate costing and contract costing.
	PRINCIPLE OF MANAGEMENT	1. Students learn the nature, scope and functions of management. 2. They learn the significance, methods and types of planning. 3. To describe the process, principles and structures of organization. 4. To understand motivation theories in management. 5. To illustrate the communication in management. 6. To make them learn about the various techniques of Controlling
	COMPANY LAW	1. Students learn the various provisions of Companies Act 2013 2. To have clear understanding about the formation of company 3. To disclose the forms, contents and alteration of memorandum and articles of association. 4. To comprehend contents and misstatement in prospective. 5. To know the qualification, appointment, powers and liabilities of director and secretary. 6. To explain the types of meeting and modes of winding up.

B.COM PART II	**FUNDAMENTAL OF ENTREPRENEURSHIP**	1. To enable the student to know the fundamental of being a good entrepreneur. 2. To enable the student to learn the concept of entrepreneurial ship. 3. To enable the student to learn about institutional finance and service to entrepreneur. 4. To know the concept of incentives and subsidies provided to the entrepreneurs by the government. 5. On successful completion of this course the student should be well versed in concept relating to entrepreneur's knowledge in the financial institution, project report, incentives and subsidies.
B.COM PART III	**INCOME TAX**	1. To familiarize the students about the Knowledge about the Income Tax Act and Residential status. 2. To extent the knowledge about the Income from salaries and House property. Description about the profit or gain of business, profession and income from other Sources. 3. Capital gain and deductions 4. To know the set off and carry forward of losses. 5. Computation of Tax liability and Assessment of Individuals.
	MANAGEMENT ACCOUTING	1. To familiarize the Students about Management Accounting techniques that facilitates managerial decision making. 2. To understand the Management Accounting objective and scope. 3. To illustrate an analysis of liquidity, solvency and profitability ratios. 4. To compute working capital, fund flow and cash flow analysis. To know the Classification of budgets and its computation. 5. To understand the Managerial applications of marginal costing.
	PRINCIPLE OF MARKETING	1. The Subject provide the insight of Modern Marketing and other Marketing Concept. 2. Make know the definition and significance of various marketing strategies such as modern marketing, global marketing, travel marketing etc. 3. To make understand the marketing functions. 4. Demonstrate Consumer behavior and customer relations marketing. 5. Describe the product mix and analysis various pricing objectives and strategies. 6. Significance of channels of distribution.

Govt. P.G. J.L.N. Arts & Science College IQAC Bemetara (C.G.)

B.COM PART III	INDIRECT TAX WITH GST	1. To impart knowledge on the indirect taxes. 2. To explain the concept of excise duty and its implication in the business 3. To make the students to understand the procedure for VAT and filling of returns. 4. To enable the students to learn the fundamental of customs duty and central sales tax. 5. To make understand the concept of GST and its implication in business 6. On successful completion of this course the student should be well versed in the prevailing act.
	AUDITING	1. To impart knowledge about auditing. 2. To have systematic knowledge about the internal control. 3. To comprehend the verification and valuation of Assets and Liabilities. 4. To clarify about Joint Stock Companies Auditor. 5. To have a detailed note on Investigation. 6. To understand the Audit Report.
	INTERNATIONAL MARKETING	1. Students developed an understanding of major issues related to international marketing 2. Students developed skills in researching and analyzing trends in global markets and in modern marketing practice 3. Be able to assess an organization's ability to enter and compete in international markets.

GOVT. PT.J.L.N.ARTS & SCIENCE PG COLLEGE BEMETARA

DEPARTMENT OF COMMERCE

M.COM PROGRAM OUTCOME (PO2): is expected to achieve followingoutcomes

1. To Prepare Post Graduate students to accept the challenges of businessworld.
2. To develop independent logical thinking and facilitate personalitydevelopment
3. To provide the students for seeking suitable careers in management and entrepreneurship.
4. To study by student's method of data collection and their interpretations through research project
5. To develop among student's communication and analytical skill.
6. To provide in-depth understanding of all core area specifically Advanced Accounting, Advanced cos Accounting, Income Tax Law & Account, Management Accounting, Managerial Economics, Managemen Concept and Organisational Behaviour, Principle of Marketing and International Marketing.

M.COM PROGRAM SPECIFIC OUTCOMEPSO2

After Completion of M. Com Program, Students can pursue research in their chosen areas.

1. For teaching in Schools and Colleges after qualifying essentialtests.
2. For working as dataanalyst.
3. To work as investment consultants after a brief internship in suitable organizations absorbed in Banking and Insurance sector asexecutives.
4. Students can work under Chartered Accountants for their taxation related work.

COURSE OUTCOME

CLASS	SUBJECT	COURSE OUTCOME
M.COM 1st SEMESTER	**MANEGERIAL ECONOMICS**	To enable the students, form a clear idea of Managerial Economics to take decision making. 1. To enable the students, understand determination ofprice under different marketforms. 2. To enable the students, understand the situationof consumer and producerequilibrium. 3. Ability to forecast demand in light of changing circumstances and to formulate businessplans. 4. Ability to chalk out BusinessPolicies. 5. Knowledge about Profit Planning andcontrol.

Govt. Pt. J.L.N. Arts & Science Collage IQAC Bemetara (C.G.)

M.COM 1st SEMESTER	**INCOME TAX LAW & ACCOUNTS**	1. To enable the students to identify the difference between Tax Evasion, Tax Planning and Tax Avoidance. 2. Understanding of various deductions, rebates and reliefs to reduce the taxable income and taxliability. 3. Skill to take managerial decisions keeping in viewthe Income TaxRules. 4. Knowledge of Double Taxation AvoidanceAgreement.
	STATISTICAL ANALYSIS	1. To bring out clearly the importance of statistics in solving different researchproblems. 2. To enable the students in-depth understanding of the concepts of sampling, correlation and theirapplicability. 3. To enable the students to learn probability theory and their applications.
	CORPORATE LEGAL FRAMEWORK	Students get knowledge of relevant provisions of various laws influencing business operations 1. Students will gain knowledge regarding formation of company, Memorandum of association; Articles of Association; Prospectus; Share capital and membership. 2. Students gain knowledge regarding negotiable instruments and their application inbusiness 3. They gain significant knowledge regarding SEBIand its regulation and laws pertaining to financial markets
	ADVANCE ACCOUNTING	Students learn accounting issues and practices such as maintenance of company accounts and handling' accounting adjustments. 1. Students acquire knowledge regarding Accounting for issue, Forfeited and redemption of shares and debentures. 2. Student learn to draft financial statements of companies. 3. Accounting issues relative to amalgamation and reconstruction of companies. 4. Accounting for holding and subsidiary companies. 5. Accounts relating to Liquidation of companies.

M.COM II SEMESTER	**TAX PLANNING AND MANAGEMENT**	Students get conversed with the concept of corporate tax planning and Indian tax laws, as also their implications for corporatemanagement. 1. Students get to know about calculation of taxable Income and tax of Firm andCompanies. 2. Return of Income, Provisional Regular, Expert and emergency assessment, re opening ofassessment. 3. Concept of tax Planning; Tax avoidance and tax evasions; Tax planning with reference of location, nature and form of organization ofnew 4. Tax planning to capital structure, decision dividend policy; Inter corporate dividends and bonusshares. 5. Preparation of income tax returns, Computationof Income tax, Tax deduction at source; Advance payment of tax.
	ADVANCE STATISTICS	Students learn the application of statistical tools and techniques for decision making. 1. Students learn the concept of Statistical Decision Theory: Decision environment, expected profit under uncertainty and assigning probabilities and utility theory. 2. Students learn Statistical Estimations, interval estimation of population mean, proportion and variance Statistical Testing - Hypothesis and Errors, Samplesize-LargeandSmallSamplingtestZtests, T Tests & F Tests. 3. Association of Attributes: Two Attributes, consistency of data, measurement of Association of. 4. Interpolation and Extrapolation - Parabolic Binomial, Newton and long rages method

M.COM II SEMESTER	**BUSINESSLAWS**	Students gained knowledge of relevant provisions of various laws influencing business operations 1. Students learn about objectives of SEBI, Functions and Role ofSEBI 2. Students get to know about MRTP Act 1969: Monopolistic Trade Practice Meaning, essentials, Restrictive TradePractices 3. Consumer Protection Act 1986: Needs of Act, Rights of consumers, Objectives ofAct. 4. FEMA Act 1999: Objectives; Regulation and Management of FEMA, PenaltiesAppeal. 5. W.T.O.: Brief History of WTO, Objectivesand Functions, Organization, W.T.O. and India,
	BUSINESS ECONOMICS	Students develop managerial perspective to economic fundamentals' as aids to decision making under given environmental constraints. 1. Students learn about Cost Theory and Estimation, economic valueanalysis 2. Students learn Price Determination under Different Market Conditions: 3. Students learn Pricing Practices: Methods of price determination in practice, pricing of multiple products; price discrimination; 4. Students learn Business Cycles: Nature and phases of business cycle; Theories of businesscycles. 5. Inflation: Definition, Characteristics and types; Inflation in terms of demand- pull and cost-push factors; Effects of inflation.
	SPECIALISED ACCOUNTING	The students get knowledge about accounting issues and practices such as maintenance of company accounts and handling accounting adjustments. 1. Students get acquainted to Accounts of General Insurance Companies. 2. Students learn Accounts of Banking Companies. 3. Accounts of Public Utility concerns: Double Accounts System. 4. Royalty accounts. Investment accounts.

M.COM III SEMESTER	**MANAGEMENT CONCEPT**	Students understand and conceptual framework of management and organizational behavior 1. Students get to know about Schools of Management Thought: Scientific, process, human behavior and social systemschool 2. Students learn about Managerial Functions:Planning - concept, significance, types; Organizing - concept, principles of authority, theories, types of organizations, authority, responsibility, power, delegation, decentralization; 3. Staffing; Directing; Coordinating; Control - nature, process, andtechniques 4. Motivation: Process of motivation; Theories of motivation 5. Group Dynamics and Team Development:Group dynamics - Definition and importance, types of groups
	ORGANIZATIONAL BEHAVIOUR	Student understand and conceptual framework of management and organizational behavior 1. Organizational Behavior:concept andsignificance; Relationship between management and organizational behavior. 2. Students learn about Leadership: Concept; Leadership styles Theories 3. Organizational Conflict: Dynamics and management; Sources, patterns, levels, and types of conflict; 4. Interpersonal and Organizational Communication: Concept of two-way communication; Communication process; Barriers to effective communication; 5. Organizational Development Concept Need for change
	ADVANCED COST ACCOUNTING	Students acquainted to the basic concepts and the tools used in cost accounting. 1. Students learn about Cost Analysis, concepts and classification, Materials control – Techniques of Materials control 2. Students get to know about Labor cost – Computation and control, Overheads – Accounting and Control. 3. Job, Batch, Contract Costing and operating costing 4. Process Costing, Joint products & By – products costing. Budgetary control

M.COM III SEMESTER	**MANAGEMENT ACCOUNTING**	Students get acquainted with the accounting concepts, tools and techniques for managerial decisions. 1. Students get the knowledge of Management accounting as a area of accounting; 2. Students gained knowledge of responsibilityaccounting 3. Budgetary control and standard costinganalysis
	ACCOUNTING FOR MANEGERIAL DECISIONS	Students get acquainted with the accounting concepts, tools and techniques for managerial decisions. 1. Break-even-analysis; Assumptions and practical applications of break- even-analysis 2. Students learn to Analyze Financial Statements: 3. Cash flow analysis and Fund flow analysis. 4. Contemporary Issues in Management Accounting. Reporting to Management

M.COM IV SEMESTER	PRINCIPLE OF MARKETING	Students understanding of the conceptual framework of marketing and its applications in decision making under various environmental constraints. 1. Students learn about nature, scope and importance of marketing; Marketing concept and its evolution. 2. Students get to know about Market Analysis and Selection – Marketingenvironment 3. Product Decisions –; Product line and productmix 4. Pricing decision and distributionchannels
	ADVERTISING & SALES MANAGEMENT	1. Students will get to know about Concept, Scope, Objectives and Functions ofAdvertising. 2. Students learn about Pre-Launch Advertising Decision: Determination of targetaudience 3. Students learn about salesmanagement
	MARKETING RESEARCH	Students get to know about research methodology and its significance in post graduate programs 1. Marketing Research decisions and market informationsystems 2. Specialized areas of application of marketing research. 3. Advertising Research: Planning and Procedure, New Product Research.
	INTERNATIONAL MARKETING	Students learn the significance of entering international markets, Export marketing is a need of an hour 1. Students learn to enter Foreign market: Product designing, standardization Vs. Adaptation; Branding, Packaging and Labeling. 2. Quality issues and after sales service; International pricing 3. Promotion of products and services abroad 4. Export policy and practices in India, Trends in India's foreign trade

Govt. Pt. J.L.N. Arts & Science P.G. College, Bemetara

Department of Botany

B.Sc Program Outcomes:-

B.ScProgram Specific Outcomes (PSOs):-

By the end of this course, the students will be able to:-

1. Understand the basic concepts of lower group plants and morphology of higher groups.

2. Understand the evolution , classification, anatomical details of higher group plants

3. Analyze the cell organelles and application of genetics, molecular biology in plant breeding

4. Identify the bacteria, viruses and plant pathogen

5. Analyze metabolic activities of plants

6. Understand the application of genetic engineering for the improvements of plants

7. Understand the basic concepts of ecology 8. Perform the procedure of laboratory technique in biochemistry, biotechnology and utilization of plants.

B.Sc Course Objectives:-

S.No	Class	Course(Paper)	Course Outcomes
1	B.Sc-I	Bacteria,Viruses,Fungi,Lichens and Algae	1.Understand the basic concept of bacteria, viruses and mycoplasma. 2.Describe the classification general characteristics of Algae. 3.Analyze economic importance of bacteria, virus and algae. 4.Discuss the life-cycle of micro organism and algae
		Bryophytes,Pteridophytes,Gymnosperms and Palaeobotany	1.Compare lower group of plants with higher lower group. 2. Identify the different plant diseases. 3. Understand the economic importance of fungi, lichens and bryophytes. 4. Discuss the classification of fungi and bryophyte. 5.Explain the classification of pteridophyta and gymnosperm. 6.Describe the economic importance of pteriodophyta and gymnosperm.

2	B.Sc-II	Diversity of Seed Plants and their Systematics	1.Understand the paleobotany and geological time scale. 2. Identify the different types of fossils 3.Explain the morphology and modification of plants Compare the types of inflorescence and fruits. 4.Describe the parts of flower Describe general taxonomic rule of plant classification. 5.Discuss the principles of botanical nomenclature. 6.Criticize the classification of angiosperm.
		Structure,Development and Reproduction in Flowering Plants	1.Preparation of herbarium. 2. Analyze the floral formula of monocot and dicot families. 3. Perform the procedure of cytological techniques. 4. Analyze the biostatistics data. 5. Understand and identify the plants under natural environment Compare the types of inflorescence and fruits. 6. Describe the parts of flower
3	B.Sc-III	Plant Physiology,Biochemistry and Biotechnology	1.Describe the plant growth and its growth regulators. 2. Describe the seed-dormancy and methods to break-dormancy. 3. Describe the plant-defense and role of secondary metabolites. 4. Discuss plant tissue culture technique and its application. 5. Discuss the advantages and disadvantages of genetic-engineering.
		Ecology and Utilization of Plants	1.Compare the various ecological successions. 2. Explain different types of environmental pollution and its management. 3. Understand about the renewable and non-renewable natural sources 4. Analyze the principle , types, and application of instruments. 5. Explain morphology utilization and chemical-constituents of different plants.

Govt. Pt. J.L.N. Arts & Science P.G. College, Bemetara

Department of Botany

M.Sc-Program Outcomes

Statements of Program Specific Outcomes (PSOs):-

By the end of this course, the students will be able to:

1. learn about practical technique in lab for detail study of plant structure, reproduction, anatomy, breeding procedures for hybridization.
2. To utilize the knowledge of mycology and plant pathology to satisfy the need of farmers.
3. Procure the knowledge of teaching to them while staying in the department
4. Prepare the students for many competitive exams like MPSC, UPSC NET SET GATE.
5. Enable the students to be resourceful in identifying of plants and lab.

Statements of Course Outcomes (COs):-

S.No.	Course Name(Paper)	Course objectives
1	Cytology	1.The cell structures in relation to function of cells the fundamental unit of life, are concerned in this course along with molecules present in cells. 2.Apply the principles of cell biology in designing experiment, statistical analysis, and interpretation of results. 3.Operate and solve exercise using computation statistics software. 4. Get acquitted with basic approach in the research methodology.

Govt. Pt. J.L.N. Arts & Science College IQAC Bemetara (C.G.)

2	Genetics	I. After successful completion of this course, students will be able to Acquaint with concepts in prokaryotic, eukaryotic, and viral genetics. II. Explain central dogma of molecular biology (replication, transcription, and translation). III. Enlist and explain types of mutation, gene regulation and transposable element. IV. Conversant with Laboratory Techniques viz. Microscopy, SEM & TEM, Ultracentrifugation, fractionation, Electrophoresis, PCR, GISH, FISH and Immunochemical techniques. The flow cytometry and confocal microscopy in karyotype analysis. V. Isolation of plant DNA and its quantification. Isolation of RNA and its quantitation . Estimation of seed proteins
3	Microbiology,Phycology and Mycology	I. Comprehend the diversity of lower cryptogams (Algae, Fungi, Bacteria, Phytoplasma and viruses. Collection and study of algae, fungi, bacteria from different localities, Identification up to generic level. II. Recognize the morphology, anatomy , physiology, reproduction and lifecycle pattern. III. Their diversification and familiarize with various ecological niche. IV. Positive and negative values.
4	Bryophyte,pteridophyte and Gymnosperm	I. Demonstrate an understanding of archegoniatae, Bryophytes, Pteridophytes and Gymnosperms • II. Develop critical understanding on morphology, anatomy and reproduction of Bryophytes, Pteridophytes and Gymnosperms • III. Understanding of plant evolution and their transition to land habitat. • IV. Demonstrate proficiency in the experimental techniques and methods of appropriate analysis of Bryophytes, Pteridophytes, Gymnosperms

S.No.	Course Name(Paper)	Courseobjectives
1	Taxonomy and Diversity of Plants	I. Study plant morphology II. Description of a plant specimen. III. Study of at least 20 locally available families of flowering plants. IV. Identification of genus and species of locally available wild plants. V. Preparation of botanical keys at generic level by locating key characters. VI. Knowledge of at least 10 medicinal plant species. VII. Knowledge of secondary metabolites and its use in taxonomy.
2	Molecular Biology	I. Study Mendelian law including incomplete dominance, penetrance , expressivity in Drosophila. II. Explain the study of chromatin organization, karyotype analysis. III. Discuss the breeding behavoiur of duplicator, deficiency, inversion and translocation. IV. Detail study of spontaneous and indeed mutation of chromosomes on the basis of karyotype. V. Gain knowledge about actual mutations happens in plants.
3	Plant Physiology	1. Students will be able to understand the various physiological life processes in plants. 2. They will also gain about the various uptake and transport mechanisms in plants and are able to coordinate the various processes. 3. They understand the role of various hormones, signaling compounds, thermodynamics and enzyme kinetics. 4. During the course students will gain knowledge about various mechanisms such as channel or transport proteins involved in nutrient uptake in plants.

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4	Plant Metabolism	1. After completion of the course the students are familiar with various physiological aspects involved in the plant development. 2. Also the role of enzymes in it and mechanism of photosynthesis, respiration, nitrogen and lipid metabolism. 3. The students are able to isolate starch, pectin and various nutritive products from the plants. 4. Qualitative and quantification of the plant contents and its biochemistry and mode /mechanism of synthesis etc.

S.No.	Course Name(Paper)	Courseobjectives
1	Plant development and Plant resources	1.Know about plants anatomical structure, their developmental patterns. 2.Plant reproductive parts development of male, female gametophytes and fruits. 3.Vascular tissues and its constituents by sections and maceration, wood anatomy, TS, TLS and RLS. 4. Mechanical tissues (Collenchyma, Sclerenchyma, Stone cells and Xylem) , Secretary tissues (Mucilage Canals, Resin canals, Nectaries, and oil glands), laticifers (Latex cells and Vessels). 5.Normal and abnormal secondary growth etc.
2	Plant Ecology-I	1.On completion of this course the students are able to analyze various types of ecosystems, correlate different ecosystems. 2.To analyze the threat and suggest conservative measures. 3.The students are also trained in the environmental impact analysis. 4.Students are able to analyze, monitor various physical, chemical and biological properties of soil water and air.
3	Plant Biotechnology-I	1.Know about Equipment's required in Tissue culture Lab. 2.Media preparation techniques for different plants. 3.Sterilization techniques for media as well as for explants,explant Culture.- Anther culture Pollen culture, Micropropagation. 4.Embryo rescue technique.Somaclonal variation. In vitro mutation. Isolation of plant protoplasts and viability testing. 5.Protoplast fusion techniques. Tissue culture of important Horticultural, medicinal plants
4	Molecular Plant Pathology-I	Students will acquire knowledge on: 1) The general bases of plant diseases caused by biotic and abiotic agents. 2) Major infective crop diseases with severe economic impact.

1	Plant reproduction and Plant resources	1.Understand core concepts of Economic Botany and relate with environment, populations, communities, and ecosystems. 2.Develop critical understanding on the evolution of concept of organization of apex new crops/varieties, importance of germplasm diversity, issues related to access and ownership. 3. Develop a basic knowledge of taxonomic diversity and important families of useful plants. 4.Understand the common cultivation methods of microalgae including photobioreactors and open ponds, Seaweed bioresources etc. 5.Appreciate the diversity of plants and the plant products in human use. Understand the concept of IPR, various legal issues related to IPR. 6.Exploring the potential of Marine bioresources, Microbial , medicinal plants etc.Varoius phytochemical techniques, industrial process, pharmacognostic procedures, authentication of specimens, Preservation of plants and plants products
2	Plant Ecology-II	1.Appreciate the need of biodiversity conservation in the context of various developmental pathways and policy framework that the mankind has been undergoing. 2.Concepts of Hotspots, megadivsrsity regions of the world. 3.Use of modern methods in plant taxonomy viz. Cytological, chemical, embryological pollen characters along with micromorphological features. 4.Concept of numerical taxonomy .Concept and use of cladistics, phonetics, and molecular tool in biodiversity studies.
3	Plant Biotechnology-II	1.Students will have knowledge about creative genetically modified bacteria. 2. They will get knowledge that advance proteomic technologies can help us to develop better drugs. 3.Students will know how they can grow disease free plant by tissue culture technique. 4.They will develop understanding about how gene technology has helped in improving various qualities in Crops. 5. Students will know about the use of computational approach to analyze, manage & store biological data. They are able to know, the use of information technology in biotechnology for data storage, Analyzing the DNA sequences.
4	Molecular Plant Pthology-II	Students will acquire knowledge on: 1) The general bases of plant diseases caused by biotic and abiotic agents. 2) Major infective crop diseases with severe economic impact. 3) The measurement of disease symptoms. 4)Principle of disease control in according to the recent

		legislation of integrated or biological disease management.

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Department of Zoology

B.Sc. Program Outcomes:-

B.Sc. Program Specific Outcomes (PSOs):-

By the end of this course, the student will be able to:-

1. Understand the basic concepts of all the types of animals (vertebrates and non-vertebrates).
2. Understand the evolution, classification, anatomical details of higher group of animals.
3. Analyze the cell organelles and application of genetics, molecular biology of animal cell.
4. Identify the bacteria, viruses and animal pathogens.
5. Analyze metabolic activities of animals.
6. Understand the application of genetic engineering for the improvement species of animals.
7. Understand the basic concepts of ecology
8. Perform the procedure of laboratory technique in biochemistry, biotechnology and important of animals.
9. Prepare the student for many competitive exams like MPSC, UPSC, NEET, SET and GATE.

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B.Sc.Course Objectives:-

S.No.	Class	Course(Paper)	Course Outcomes
1.	B.Sc. I	Cytology	1. The cell structure in relation to function of cells the fundamental unit of life, are concerned in this course along with molecules present in cells. 2. Apply the principles of cell biology in designing experiment, statistical analysis, and interpretation of results. 3. Operate and solve exercise using computation statistics software. 4. Get acquitted with basic approach in the research methodology.
		Protozoan	1. Understand the basic concept of bacteria, viruses and protozoan 2. Analyze economic importance of bacteria and virus. 3. Discuss the life cycle of protozoan.

2.	B.Sc. II	Animal Physiology	1. Students will be able to understand the various physiology life processes in animals. 2. They understand the role of various hormones, signaling compounds, thermodynamics and enzyme kinetics. 3. During the course student will gain knowledge about the various mechanisms such as digestion, respiration circulation and reproduction.
		Metabolism	1. After completion of the course the students are familiar with various physiology aspects involved in the plant development. 2. Also the role of enzymes in it and mechanism of photosynthesis, respiration, nitrogen and lipid metabolism. 3. The student are able to isolate starch, pectin and various nutritive products from the plants. 4. Quantative and quantification of the animal cell content and its biochemistry and mode/mechanism of synthesis etc.

3.	B.Sc.III	Genetics	1. After successful completion of this course, students will be able to Acquaint with the concepts in prokaryotic, eukaryotic and viral genetics 2. Explain central dogma of molecular biology (replication, transcription and translation). 3. Enlist and explain types of mutation , gene regulation and transposable element. 4. Conversant with laboratory techniques via , Microscopy, SEM and TEM, Ultracentrifugation, PCR,GISH,FISH and Immunochemical techniques. The flow cytometry and confocal microscopy in karyotype analysis. 5. Isolation of plant DNA and its quantification. Isolation of RNA and its quantitation. Estimation of seed protiens.

		Microbiology, Phycology and Mycology	1. Comprehend the diversity of lower cryptograms (Algae, Fungi, Bacteria, Phytoplasam and viruses.). Collection and study of algea, fungi, bacteria from different localities, identification up to generic level. 2. Recognize the morphology, anatomy, physiology, reproduction and lifecycle pattern. 3. Their diversification and familiarize with various ecological niche. 4. Positive and negative values.

		Metabolism	1. After completion of the course the students are familiar with various physiology aspects involved in the plant development. 2. Also the role of enzymes in it and mechanism of photosynthesis, respiration, nitrogen and lipid metabolism. 3. The student are able to isolate starch, pectin and various nutritive products from the plants. 4. Quantative and quantification of the animal cell content and its biochemistry and mode/mechanism of synthesis etc.
		Ecology –I	1. On completion of this course the students are able to analyze various types of ecosystems, correlate different ecosystems. 2. To analyze the threat and suggest conservation measure. 3. The student are also trained in the environmental impact analysis. 4. Student are able to analyze,

			monitor various physical, chemical and biological properties of soil water and air.

Govt. Pt.J.L.N. Arts & Science PG College Bemetara

Distt – Bemetara

Department of History

B.A.(History) PROGRAM OUTCOME (PO2) : is expected to achieve following outcomes

- विद्यार्थियों में प्रतियोगिता परीक्षाओं में भाग ले सकते हैं जैसे– नेट, सेट, यू.पी.एस.सी, सी.जी.पी.एस. सी. इत्यादि।
- विद्यार्थियों में नेतृत्व क्षमता का विकास होता है, यह नेतृत्व क्षमता एक राजनेता के रूप में भी हो सकता है।
- विद्यार्थी भावी राजनैतिक रणनीतियों के लिए इतिहास के महान राजनीतिज्ञों की नीतियों को आत्मसात कर सकते है।
- विद्यार्थियों में देश की राजनीति के प्रति जागरूकता का विकास होता है।
- इतिहास के माध्यम से ही विश्व की महानतम सभ्यता व संस्कृति का ज्ञान प्राप्त होता है।
- विद्यार्थियों को प्राचीन, मध्यकालीन व आधुनिक इतिहास की घटनाओं का ज्ञान प्राप्त होता है।
- विद्यार्थियों में मानवीय अधिकारों के प्रति जागरूकता का विकास होता है।
- विद्यार्थियों में सर्वधर्म समभाव की भावना का विकास होता है।

COURSE OUTCOME :

CLASS	SUBJECT	OUTCOME
B.A.I	प्राचीन भारत का इतिहास (प्रारंभ से 1206) ई. तक	• विद्यार्थियों को इतिहास के सिद्धांत व संकल्पना से अवगत कराते है। • प्राचीन भारतीय सभ्यता व संस्कृति का ज्ञान प्राप्त होता है। • प्राचीन भारतीय इतिहास के महानतम सम्राटों की जानकारी मिलती है। • प्राचीन भारतीय के प्राचीन स्मारकों की जानकारी मिलती है। जिसे सरकार संरक्षण प्रदान किये है। • प्राचीन भारत के विभिन्न धर्मो के बारे में जानकारी मिलती है। • प्राचीन भारत के कला कृतियों की जानकारी मिलती है।
	विश्व का इतिहास (1453 से 1789)	• विभिन्न महाद्विपीय देशों की जानकारी मिलती है। • विभिन्न देशों की राजनैतिक व्यवस्थाओं की जानकारी मिलती है। • विभिन्न देशों की शासन संबधि नीतियों की जानकारी मिलती है।

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		• नवीन अविष्कारों जैसे– कुतुबनुमा, छापाखाना, इत्यादि। • उपनिवेशवाद, साम्राज्यवाद जैंसे शब्दों का सही अर्थ की जानकारी।
B.A.II	मध्यकालीन भारत का इतिहास (1206 से 1761 तक)	• मध्यकालीन भारत में तुर्को व मुगलों के भारत आगमन की जानकारी मिलती है। • विदेशो से राजनीतिक संबंधों की जानकारी मिलती है। • ऐतिहासिक स्मारकों की जानकारी मिलती है। • वास्तुकला की जानकारी मिलती है। • कला के क्षेत्र में अद्वितीय जानकारी मिलती है।
	विश्व का इतिहास 1789 से 1871 तक	• फ्रांस की राज्य क्रांति जो कि पूरे विश्व परतंत्र देशों के लिए प्रेरणा स्त्रोत थी कि जानकारी मिलती है। • नेपोलियन जैसे महत्वकांक्षी शासकों की मिलती है। • विभिन्न देशों की पारस्परिक निर्भता की जानकारी मिलती है।
B.A.III	आधुनिक भारत का इतिहास (1761 से 1950 तक)	• यूरोपीयों के भारत आगमन की जानकारी मिलती है। • विदेशों से भारतीयों के व्यापारिक संबंधों की जानकारी मिलती है। • मराठा शासन पद्धति की जानकारी मिलती है। • भारत की स्वतंत्रता प्राप्ति की जानकारी मिलती है।
	विश्व का इतिहास 1871 से 1945 तक	• बिस्मार्क जैसे शाक्तिशाली राजनेता की जानकारी मिलती है, जिसके अथक प्रयत्नों से जर्मनी का एकीकरण संभव हुआ। • जापान का आधुनिकीकरण जिसने पूर्वी देशों में नवचेतना के संचार की जानकारी मिलती है। • राष्ट्रसंघ, संयुक्त राष्ट्रसंघ, व विश्व स्वास्थ्य संगठन की जानकारी मिलती है।

समाज शास्त्र विभाग

उद्देश्य –

वर्तमान समय में समाज में रचनात्मक एवम् विद्यटनात्मक दोनो ही क्रिया हो रही है और इसे समझे बिना समाज की व्यवस्था, संरचना, संगठन व विद्यटन को नही समझा जा सकता। इसी समझ से समाज में रचनात्मक क्रियाओं की वृद्धि की जा सकेगी। साथ ही इसी तारतम्य में विद्यटनात्मक क्रिया को कम से कम किया जा सके।

यह स्थिति वर्तमान लोकतांत्रिक व्यवस्था को बनाये रखने में महत्वपूर्ण भूमिका साबित हो सकती है। लेख का आशय यह है कि यही समझ विद्यार्थियों को समाज को समझने में एक दिशा देगी। वे विद्यार्थी अपनी बौद्धिक प्रक्रिया का समाज के लिये अपनी क्षमता व योग्यता के अनुसार अपना योगदान दें सकेंगे।

उपादेयता –

उक्तांकित विवेचन से यह बात स्पष्ट है कि समाज शास्त्र के दिशा निर्देश पर समाज का समग्र व विशेष अध्ययन के माध्यम से समाज के हर पक्ष का विश्लेषण वैज्ञानिक रूप से किया जा सके। जिससे समाज की सामाजिक नीति, सामाजिक कल्याण, सामाजिक समस्याओं आदि का न्यायोचित विवेचन किया जा सकेगा जिससे समाज प्रगतिशील होगा। ऐसा अध्ययन केवल समाजशास्त्र के अंदर ही संभव है, अन्य सामाजिक विज्ञानों में नही है। यही परिस्थितियाँ समाजशास्त्र के उद्‌भव के लिये प्रेरक बिंदु है। यह तथ्य समाजशास्त्र के उपादेयता को सिद्ध करने में मील का पत्थर के समान है।

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डॉ. आर. पी. त्रिपाठी
सहायक प्राध्यापक समाजशास्त्र
शा. पं. ज. ला. ने. स्नातकोत्तर महा. बेमेतरा

Govt. Pt. J.L.N. Arts & Science P.G. College Bemetara

DEPARTMENT OF GEOGRAPHY

PROGRAMME SPECIFIC OUTCOME OF THE M.A.GEOGRAPHY

GEOGRAPHY OF RESOURCES

CO1. Develop an idea about resource.
CO2. Understand the concept of different types of resources.
CO3. Acquire knowledge about different types of power resources.
CO4. Explain population - resource relationship and different types of population resources.

PRACTICAL

CO1. Develop an idea about scale and draw different types of scale like linear, diagonal and vernier.
CO2. Acquire knowledge different types of map projection.
CO3. Gain knowledge about topographical maps and apply this knowledge in ground serface.
CO4. Learn the use of various minor instruments like rotameter, Planimeter and Pantrograph.

GEOGRAPHY OF ECONOMIC ACTIVITIES

CO1. Understand different types of economics activities.
CO2. Indentify farming in humid tropics.
CO3. Know about the various industrial occupations.

POPULATION GEOGRAPHY

CO1. Gain knowledge different aspects of population geography.
CO2. Develop an idea about the concept of Migration.

SETTLEMENT & POLITICAL GEOGRAPHY

CO1. Build an idea about urban and rural settlements, and its relationship with environment and also different theories related to settlement geography.

CO2. Know about political geography.

PRACTICAL

CO1. Brings direct interaction of different types of surveying instruments like Prismatic Compass, Plane table, Dumpy level, Theodolite with environment.
CO2. Gain knowledge about geological maps and drawing of sections and interpretations of the relief and structure of the geological maps.

CO3. Identification of different types of rock and minerals.

CLIMATOLOGY

CO1. Students will learn the process of interaction between the atmosphere and the earth's surface.

CO2. They will be able to understand the importance of the ozone layer and bad effect of green- house gasses moreover will be eligible to apply this for the solution of environmental problem.

CO3. They understand how the planetary and periodic wind and pressure belt related to each other. Also they understand how to develop the tropical cyclones, El Nino and La Nina.

CO4. Students can explain the important role of water to create condensation and precipitation.

BIOGEOGRAPHY

CO1. They can know the soil formation processes, development and soil physical and chemical composition.

CO2. Understand the genetic soil classification and U.S.D.A. soil taxonomy.

CO3. Students can learn the scope and significance of biogeography. Also know, factors affecting the growth and distribution of natural vegetation.

CO4. They also gather knowledge about biome, ecotone and community, types and component parts of ecosystem, bio-energy cycle, food chain and trophic level. This can help them to predict the future change of biogeographical components.

CO5. They can illustrate the importance about bio-diversity and wetlands.

GEOGRAPHY OF INDIA

CO1. They can know about their own countries land formation, climate and natural vegetation.

CO2. They understand the population problems in India. Access the population policies and reaction the countries.

CO3. They understand globalization and Indian economy. And also understand the regional distribution of resource.

NATURE & METHODOLOGY IN GEOGRAPHY

CO1. Gain knowledge about the historical evolution of geographical thoughts.

CO2. Understand the philosophy of deterministic, possibilistic and ecological approach.

CO3. Know about man-environment relation, regional location and space.

CO4. Know about physical and socio economic survey, how to collect primary and secondary data, questionnaire. It's helped them to research work in the future.

SOCIAL & CULTURAL GEOGRAPHY

CO1. Evaluate the social issues such as- racism, cast conflict, social distance.
CO2. Understand the causes of social inequality and their impact on society.
CO3. Students can understand indicators of social well-being and quality of life.
CO4. Discuss about the social space, social groups and intra-urban mobility.
CO5. They can define the cultural region of the world.
CO6. Students can learn about rural settlement morphology, urban-industrial landscape.
CO7. Analysis the social set-up in Indian villages.

OPTIONAL
POPULATION GEOGRAPHY

CO1. Understand the nature of population. Know about composition of population, like- age, sex marital status, family, economic composition and language.

CO2. Analyze the global trend and patterns of population growth in developing countries, and migration patterns.

CO3. Evaluate the population growth theory and migration theories.

CO4. Understand the population policies in different countries.

OPTIONAL
URBAN GEOGRAPHY

CO1. Students can explain the town and cities in India and World perspective.
CO2. Gain knowledge about the history of urbanization in the developed and developing countries.
CO3. They can understand the functional differences between rural and urban settlements.
CO4. Students can define the problems of urban area. And try to solve them.
CO5. They will know the characteristics of urban settlement.
CO6. To be able to identify the urban environmental problem and how to solve those problem.

PRACTICAL

CO1. Students learn to use of various meteorological instruments and also learn to interpret of the Indian daily weather report.

CO2. That's help students to predict the weather report in future.

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CO3. They understand and gain knowledge about statistical techniques.

CO4. Students learn to use the pocket stereoscope and interpret the aerial photograph with the help of pocket stereoscope. Also develop their skill in remote sensing and G.I.S.

PRACTICAL

CO1. Students learn to draw many cartography diagram and apply this is in different statistical data.

CO2. They can able to select the appropriate technique for graphical presentation of a data to their field work.

CO3. Their knowledge about primary and secondary data collection helps them to prepare their survey report.

COURSE OUTCOMES (Cos) OF THE COURSE B.A GENERAL GEOGRAPHY

PART I

PAPER-I

PHYSICAL GEOGRAPHY

Co1. The students will be familiar with the earth's interior.
Co2. Develop an idea about earth movements and the related topography.
Co3.Acquire knowledge about different types of rock and their origin .Influence of the rocks on land form and topography.
Co4. Getting familiar with the concept of hydrology
Co5. Understanding the processes of erosion, deposition and resulting landforms.

PAPER -II

Climatology and Biogeography

Co1.Students will learn about the atmosphere and the climate, pressure belts, wind systems, monsoon and their importance, difference between climate and weather.

Co3.Students can learn the significance of biogeography. They will also get to know about the factors responsible for plant growth.

PAPER-III

PRACTICAL

Co1. Developing an idea about scales and how to draw different types of scales; conversion of scales.
Co2. Forming a clear concept on map projections.
Co3. Topographical maps and its application in practical.
CO4. Getting familiar with underlying structures with the help of geological maps.

PART II

PAPER-IV

HUMAN GEOGRAPHY

CO1. -The students will be aware of the scope and contents of human geography.

CO2. Man's adaptation in various environments.

CO3. This particular module aims to develop an idea about the world population distribution and the factors that lead to uneven distribution of the population. It also focuses on the problem that is likely to arise due to an increase in the world population.

CO4. - Different types of settlement and characteristics and their definitions.

CO5. scope and content of social geography; race characteristics and distribution ;factors and characteristics of underdevelopment.

PAPER-V

ECONOMIC GEOGRAPHY

CO1.This module deals with the scope and content of economic geography; economic activities- primary, secondary, tertiary.

CO2. Focuses on the concept of agricultural geography; Cultivation and their association with different natural and human conditions of the following cereal crops: wheat, rice; plantation crops: rubber; agricultural systems of the world; commercial grazing –cattle and sheep rearing.

CO3. Definition of power resources; coal, petroleum and water

CO4. Discussing the factors behind the localization of industries; with special reference to the study of iron, steel and aluminum industry.

CO5. Definition and classification of resources and the infrastructural facilities required for resource development. Reference to resource conservation.

PAPER-VI

PRACTICAL

CO1. To learn graphically about the enlargement and reduction of maps.
CO2. Learning about chain surveying and prismatic surveying.

CO3. Getting to know superficially about remote sensing and aerial photo interpretation with the help of pocket stereoscope.

CO4. Necessity of field report in practical geography; collection of data and how to prepare a report from the data collected.

PART III
PAPER-VII
REGIONAL GEOGRAPHY

CO1. The module focuses on the regional geography of India.

a. Physical relief
b. Drainage
c. Climate
d. Soil
e. Natural vegetation.

Their characteristics and distribution; deforestation and conservation of forest.

CO2. Also focuses on agriculture, power resources and industries of India.

CO3. Familiarizing the students with different concept of population geography like growth, distribution and migration. Also making them aware of the different ethnic groups residing in India (santhals ,naga and the bhils)

PAPER-VIII
PRACTICAL

CO1. Lessons on different statistical methods used in practical geography e.g. frequency polygon, cumulative frequency, mean, median and mode etc.

CO2. Lessons on cartograms like pie graph, bar graph, and age-sex pyramid etc.

CO3. Lessons on meteorological instruments like maximum and minimum thermometer, rain gauge, dry and wet bulb thermometer.

Programme and course outcome of English Language and Literature

Course 1 : Literature in English from 1550-1750 A.D.

CO1. The students after the completion of the course will be able to demonstrate knowledge of the major texts and traditions of English literature.

CO2. The students after the completion of the course will be able to contemplate and comprehend different periods of literature and important authors like Shakespeare, Milton and others of English literature.

Course 2 : Literature in English from 1750-1900 A.D.

CO1. The students after the completion of the course will be able to contemplate and comprehend and become familiar with representative literacy and cultural texts ina significant number of historical cultural contexts.

CO2. The students after the completion of the course will be able to contemplate and comprehend and form an idea about the various stages in the development of English literature.

Course 3 : Mordern English Literatures - I

CO1. The students after the completion of the course will be able to contemplate and comprehend and develop critical thinking through long and short fictions of English literature.

CO2. The students after the completion of the course will be able to write and appreciate types of prose of English literature.

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Course 4 : Mordern English Literatures - II

CO1. The students after the completion of the course will be able to familiarize with the plays of master – dramatists and will have developed the ability to appreciate and evaluate different types of plays of English literature.

CO2. The students after the completion of the course will be able to appreciate and evaluate different types of plays of English literature.

Course 5 : India Writing in English

CO1. The students after the completion of the course will be able to contemplate and comprehend and recognize the various phases of the evolution of India Writing in English.

CO2. The students after the completion of the course will be able to contemplate and comprehend and recognize the thematic concern, genres and trends of India Writing in English.

Course 6 : American Literature

CO1. The students after the completion of this course will be able to contemplate and comprehend and recognize the cultural themes, literary periods and key artistic features of American Literature.

CO2. The students after the completion of the course will be able to contemplate and comprehend and recognize the various aspects of American Society through a critical examination of the literary texts representing different periods and culture.

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Department of English
P.G. College Bemetara

Govt. Pt. J.L.N. Arts & Science PG College, Bemetara
Department of Biotechnology

Program Outcomes Of B.Sc Biotechnology

- To introduce to concept in detail related to the biotechnology and applied subject.
- To improvising the technical skill and implying them.
- To develop acquiring knowledge through theory and practical.
- To encourage the student to undertake higher studies and research in biotechnology field.
- To improvising the communication and presentation skill.
- Learning various technique and handling of laboratory instruments.
- Several career opportunities are available for student with biotechnology.
- To student enabled themselves applying for different examination like GAT, SET, NET etc.

Govt. Pt. J.L.N. Arts & Science College IQAC Bemetara (C.G.)

Govt. Pt. J.L.N. Arts & Science PG College, Bemetara
Department of Biotechnology

Course Outcome of Biotechnology

Class	Subject	Outcome
B.Sc I	Biochemistry, Math's and Computer	• Student to gain an insight into the metabolic process associated with the catabolism of carbohydrate amino acid & lipid. • Student will be able to understand computer networking ,internet search, algorithm & flow charts.
	Cell Biology and Genetics	• This course introduce the student to the basics of cell & its components • This gives them a strong foundation on the basic unit of life. • To make the student to understand the concept of genes & their behavior. • Study the structure & numerical chromosome aberration & their consequence. • Student get to know about various syndrome in human.
B.Sc II	Molecular Biology and Biophysics	• Student will able to understand molecular biology process like DNA replication, transcription & repair system. • To make the student to understand principle, working & application of various instrument used in various field of research.
	Recombinant DNA Technology	• Student of this course have knowledge on gene manipulation, gene expression etc which prepare then from further studies in the area of genetic engineering .
B.Sc III	Plant Environment and Industrial Biotechnology	• To understand various sterilization technique involved in in vitro propagation of plant. • The course present the study & the management of the environment .
	Immunology	• Student gain knowledge about immune principle of immunology & its application in treating human disease. • The course develops in the student an appreciation for principle of immunology and its application in treating human disease.

Govt. Pt. J.L.N. Arts & Science College IQAC Bemetara (C.G.)

VISION

To become a Center of excellence offering quality education and innovation in Computer Science and Information Technology.

MISSION –

- To prepare the students to excel in the field of Computer Science and IT industry.
- To prepare the students to pursue higher studies and develop sustainable innovative solutions for the society.

Programme Educational Objectives (PEOs)

PEO 1	Graduates of the programme will be employed in the field computer Science.
PEO 2	Graduates of the programme will pursue higher studies.
PEO3	Graduates of the programme will apply new technologies in Computer Science to serve the needs of industry, and society.

Programme Outcomes (Pos)

Po1 : Ability to apply knowledge in mathematics, science fundamentals to solve problems.

Po2 : Understand the basic concepts of system software, hardware and evolution of computer graphics.

Po3 : Ability to use a range of programming languages and tools to develop computer programs that are effective to solve the problems.

Po4 : Understand the basic concept of computer architectures, including computer hardware and networking.

Po5 : Design, and analyze precise specifications of algorithms, procedures, and interaction behavior.

Po6 : Ability to communicate effectively in both verbal and written form in industry and society.

Po7 : Ability to work in teams to build software systems.

Po8 : Apply the technologies in various fields of Computer Science, including Mobile applications, Web site development and management, databases, and computer networks.

Po9 : Ability to select appropriate techniques to tackle and solve problems in the discipline of information security management.

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B.Sc. Computer Science – Part-1

Course Outcomes
(Computer Software- C Programming)

LO1. Create and initialize variables, constant, arrays, pointers, structures and unions.
LO2. Manipulate values of variables, arrays, pointers, structures, unions and files.

LO3. Create the function that can receive variables, arrays, pointers and structures.

LO4. Define functions that can receive variables, arrays, pointers and structures.

LO5. Create open, read, manipulate, write and close files.

LO6. Select and use appropriate data structures for the given problems.

Course Outcomes
(Computer Hardware)

1. Demonstrate knowledge of binary number theory, Boolean algebra and binary codes.

2. Analyze and design combinational systems using standard gates and minimization methods (such as Karnaugh maps).

3. Analyze and design combinational systems composed of standard combinational modules, such as multiplexers flip-flops, demultiplexer and decoders.

4. Demonstrate knowledge of simple synchronous sequential systems.

5. Analyze and design sequential systems composed of standard sequential modules, such as counters and registers.

6. Analyze and design simple systems composed of programmable logic, such as ROMs and PLAs.

7. Perform basic arithmetic operations with signed integers represented in binary.

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B.Sc. Computer Science – Part-2

Course Outcomes
(Computer Software- C++ Programming)

LO1. Create and initialize variables, constant, arrays, pointers, structures and unions.
LO2. Manipulate values of variables, arrays, pointers, structures, unions and files.

LO3. Create the function that can receive variables, arrays, pointers and structures.

LO4. Define functions that can receive variables, arrays, pointers and structures.

LO5. Create open, read, manipulate, write and close files.

LO6. Select and use appropriate data structures for the given problems.

LO7. Use Object oriented design.

Course Outcomes
(Computer Hardware)

1. Demonstrate knowledge of binary number theory, Boolean algebra and binary codes.

2. Analyze and design combinational systems using standard gates and minimization methods (such as Karnaugh maps).

3. Analyze and design combinational systems composed of standard combinational modules, such as multiplexers flip-flops, demultiplexer and decoders (8085 microprocessor).

4. Demonstrate knowledge of simple synchronous sequential systems.

5. Analyze and design sequential systems composed of standard sequential modules, such as counters and registers (REGISTERS)

B.Sc. Computer Science – Part-3

Course Outcomes
(Computer Software- DBMS)

1. Describe the fundamental elements of relational database management systems
2. Explain the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.
3. Design ER-models to represent simple database application scenarios
4. Convert the ER-model to relational tables, populate relational database and formulate SQL queries on data.
5. Improve the database design by normalization.
6. Familiar with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing.

Course Outcomes
(Computer Hardware)

1. Demonstrate knowledge of binary number theory, Boolean algebra and binary codes.

2. Analyze and design combinational systems using standard gates and minimization methods (such as Karnaugh maps).

3. Analyze and design combinational systems composed of standard combinational modules, such as multiplexers flip-flops, demultiplexer and decoders (8086 microprocessor).

4. Demonstrate knowledge of simple synchronous sequential systems.

5. Analyze and design sequential systems composed of standard sequential modules, such as counters and registers (REGISTERS)

PROGRAM OUTCOMES – B.C.A.

1. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
2. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
3. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
4. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
5. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
6. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
7. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
8. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
9. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
10. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
11. Lifelong learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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OGRAM OUTCOMES (POs)

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Lifelong learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

COURSE OUTCOMES

BCA-101 - Computer Fundamentals

CO1: Be able to identify computer hardware and peripheral devices

CO2: Be familiar with software applications

CO3: Understand file management

CO4: Accomplish creating basic documents, worksheets, presentations with their properties.

CO5: Experience working with email and recognize email netiquette.

- C Language

Understand the basic terminology used in computer programming

Use different data types in a computer program.

Design programs involving decision structures, loops and functions.

Explain the difference between call by value and call by reference.

Understand the dynamics of memory by the use of pointers.

Use different data structures and create/update basic data files

BCA-103 - Mathematics

CO1. Demonstrate competency in the areas that comprise the core of the mathematics major

CO2. Demonstrate the ability to understand and write mathematical proofs

CO3. Be able to use appropriate technologies to solve mathematical problems

CO4. Be able to construct appropriate mathematical models to solve a variety of practical problems

CO5. Obtain a full-time position in a related field or placement

BCA-104 - Basics of Internet Programming

CO1: Analyze a web page and identify its elements and attributes.

CO2: Create web pages using HTML and Cascading Styles sheets.

CO3: Build dynamic web pages using JavaScript (client side programming).

CO4: Create XML documents used in Web Publishing.

CO5: Create XML Schema for data transfer in distributed environment.

BCA-105 - Communication Skills

CO:1. Students will be able to understand and apply knowledge of human communication and language processes as they occur across various contexts, e.g., interpersonal, intrapersonal, small group, organizational, media, gender, family, intercultural communication, technologically mediated communication, etc. from multiple perspectives.

CO:2. Presentation skills training courses provide strategies to plan, structure and deliver powerful presentations. Learn how to structure presentations in order to deliver effective messages as well as receive the coaching to dramatically improve your personal presentation. This specific program is one of the leading presentation skills training courses developed to help people engage audiences.

CO:3 A group discussion among students is being organized to see and evaluate their thinking skills, listening abilities and how they are communicating their thoughts. One should learn to control the conversation through listening attentively and then having the perseverance to mould it towards his/her own direction.

CO:4 Develop, exhibit and accurate sense of self and nurture a deep understanding of personal motivation. Develop an understanding of and practice personal and professional responsibility.

CO:5 To practice and develop writing processes pertaining to invention, revision, organization, drafting through multiple drafts, editing, and adjusting for rhetorical context (purpose, audience, persona). To

cuss and share writing and reading with one another and develop a shared vocabulary for talking bout writing.

A-106 Principles of Management

01. Assume the roles and responsibilities associated with managerial functions.

02. Identify the key contributors and their contributions in the development of management thought.

03. Compare various approaches in management for problem solving.

BCA-107 – Computer Fundamental & PC Computing Lab

CO1. Describe the usage of computers and why computers are essential components in business and society.

CO2. Utilize the Internet Web resources and evaluate on-line e-business system.

CO3. Solve common business problems using appropriate Information Technology applications and systems.

CO4. Identify categories of programs, system software and applications. Organize and work with files and folders.

CO5. Describe various types of networks network standards and communication software.

BCA-108 - C Language Lab

CO1. Write programs using advance concepts of C- language.

CO2. Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.

CO3. Design graphics programs using C.

BCA-109 - Internet Programming Lab

CO1. Design web pages.

CO2. Format and validate web pages.

CO3. Design web sites and deploy it on web servers.

BCA-201 - Digital Electronics

CO:1 Convert different type of codes and number systems which are used in digital transmission and computer systems.

CO:2 Apply the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.

CO:3 Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.

CO:4 Design different types of with and without memory element digital electronic circuits for particular operation, within the real time of economic, performance, efficiency, user friendly and environmental constraints.

...the nomenclature and technology in the area of various memory devices used and apply the ...mory devices in different types of digital circuits for real world application.

...-202- Computer Organization & Architecture

...Understand the major components of a computer including CPU, memory, I/O and storage.

...Students will understand the uses for cache memory.

...Understand a wide variety of memory technologies both internal and external.

...Understand the role of the operating system in interfacing with the computer hardware. CO5: Students will understand the basic components of the CPU including the ALU and control unit.

BCA-203- System Analysis & Design

CO1: Understand the major components of a computer including CPU, memory, I/O and storage.

CO2: Students will understand the uses for cache memory.

CO3: Understand a wide variety of memory technologies both internal and external.

CO4: Understand the role of the operating system in interfacing with the computer hardware. CO5: Students will understand the basic components of the CPU including the ALU and control unit.

BCA-204 - Data Structure & Algorithms

CO1: Able to walk through insert and delete for different data structures.

CO2: Ability to calculate and measure efficiency of code

CO3: Appreciate some interesting algorithms like Huffman, Quick Sort, and Shortest Path etc.

CO4: Able to walkthrough algorithm.

CO5: Improve programming skills.

BCA-205- Linux Environment

CO1: Will be able to describe and use the LINUX operating system.

CO2: Will be able to describe and use the fundamental LINUX system tools and utilities.

CO3: We will able to describe and write shell scripts in order to perform basic shell programming.

CO4: Will be able to describe and understand the LINUX file system.

BCA-206 - Environment Studies

CO1: Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving. Ecosystem Links between environmental components and their role.

CO2: Basic Structure of atmosphere and their functions Current problems related issues Students will apply knowledge of the sciences within an interdisciplinary context in solving environmental issues such as environmental health, food and agriculture, energy, waste and pollution, climate change, management, and loss of biodiversity.

CO3: Basic knowledge about water recourses, current problems related issues, water born diseases, technologies of water treatment.

el of sound and their units, sources and effects of noise pollution, control measures.

oncept of non Conventional energy resources, types and various applications of renewable resources nd current potentials of energy resources.

A-207- Data Structures& Algorithms Lab

O1. Be able to design and analyze the time and space efficiency of the data structure

O2. Be capable to identity the appropriate data structure for given problem

CO3. Have practical knowledge on the applications of data structures

BCA-208 - Linux Environment Lab

CO1. Learn UNIX structure, commands, and utilities.

CO2. Describe and understand the UNIX file system.

CO3. Write shell scripts in order to perform shell programming.

CO4. Acquire knowledge about text processing utilities, process management and system operation of UNIX.

BCA-209 - Personality Development Lab

CO1. Comprehend conversations and speeches.

CO2. Speak with clarity and confidence, thereby enhancing their employability skills.

CO3. Identify his/her creative self, and express effectively the same in writing.

CO4. Explain the advantages of teamwork and how the tasks could be completed effectively when done as a cohesive unit.

CO5. Realize that selecting goal is a fundamental component to long-term success of an individual.

CO6. Enable students to understand different aspects of leadership and evaluate in their own strengths.

CO7. Be more organized and disciplined.

BCA-301 - Object Oriented Programming using C++

CO1: Understand object-oriented programming features in C++.

CO2: Apply these features to program design and implementation.

CO3: Understand object-oriented concepts and how they are supported by C++.

CO4: Gain some practical experience of C++.

CO5: Apply the facilities offered by C++ for Object-Oriented Programming.

BCA-302 - Database Management System

CO1: Understand, appreciate and effectively explain the underlying concepts of database Technologies.

CO2: Design and implement a database schema for a given problem-domain

CO3: Normalize a database and Populate and query a database using SQL DML/DDL commands.

CO4: Declare and enforce integrity constraints on a database

concept of transaction and concurrency.

BCA-304 – Front End Design Tool (VB)

CO1: Design, create, build, and debug Visual Basic applications.

CO2: Explore Visual Basic's Integrated Development Environment (IDE).

CO3: Implement syntax rules in Visual Basic programs also Explain variables and data types used in program development.

CO4: Apply arithmetic operations for displaying numeric output.

CO5: Write and apply decision structures for determining different operations, loop structures to perform repetitive tasks.

CO6 :Write and apply procedures, sub-procedures, and functions to create manageable code.

BCA-304 - Managerial Personality Development

CO:1. Develop and maintain a Reflection.

CO:2. Develop and articulate a personal philosophy of meeting & greeting.

CO:3.Grasp the exact mean of management in so many ways like time, wardrobe & stress.

CO:4. Learn about- how to represent, effective skills & body language.

CO:5. Grasp the practical knowledge in the form of GD and interview.

BCA-305 - Technical Communication

CO:1. Demonstrate that you can effectively communicate technical material in print.

CO:2. Demonstrate that you can present technical material orally with confidence and poise.

CO:3. Demonstrate that you can present technical material using audiovisual materials.

CO:4. Demonstrate that you can communicate technical material to a variety of audiences, from members of the building and engineering trades and medical fields to government representatives and the general public.

CO:5. Demonstrate that you can work well in teams

BCA-306 - Discrete Mathematics

CO1. Be able to reason at multiple levels of detail and abstraction, being aware, in particular, of the applicability and limitations of tools from mathematics and theoretical computer science

CO2. Recognize the context in which a computer system may function, including its interactions with people and the physical world.

CO3. Able to communicate with, and learn from, experts from different domains throughout their careers

CO4. Possess a solid foundation that allows and encourages them to maintain relevant skills as the field evolves

CO5. To be able to manage their own career development and advancement

CO6. Manage their own learning and development, including managing time, priorities, and progress

...e developed interpersonal communication skills as part of their project experience

...work effectively both individually and as members of teams

...Make effective presentations to a wide range of audiences about technical problems and their solutions

...Encompass an appreciation of the interplay between theory and practice.

BCA-307 - OOPS Lab Using C++

CO1. Understand key features of the object-oriented programming language such as encapsulation (abstraction), inheritance, and polymorphism.

CO2. Design and implement object-oriented applications.

CO3. Analyze problems and implement simple C++ applications using an object-oriented software engineering approach.

BCA-308 - DBMS LAB

CO1. Demonstrate an understanding of the relational data model.

CO2. Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS.

CO3. Formulate, using relational algebra, solutions to a broad range of query problems.

CO4. Formulate, using SQL, solutions to a broad range of query and data update problems.

BCA-309 - Front End Design Tool (VB) Lab

CO1: Design, create, build, and debug Visual Basic applications.

CO2: Apply arithmetic operations for displaying numeric output.

CO3: Apply decision structures for determining different operations.

CO4: Write and apply loop structures to perform repetitive tasks.

CO5: Write and apply procedures, sub-procedures, and functions to create manageable code.

CO6: Create one and two dimensional arrays for sorting, calculating, and displaying of data.

CO7: Write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism.

CO8: Write Windows applications using forms, controls, and events.

BCA-401 - Operating Systems

CO1: Understand the basic working process of an operating system.

CO2: Understand the importance of process and scheduling.

CO3: Understand the issues in synchronization and memory management.

BCA-402 - Computer oriented Numerical & Statistical Methods using C

CO1. Apply numerical methods to find our solution of algebraic equations using different methods under different conditions, and numerical solution of system of algebraic equations.

Apply various interpolation methods and finite difference concepts.

Work out numerical differentiation and integration whenever and wherever routine methods are not applicable.

Work numerically on the ordinary differential equations using different methods through the theory of finite differences.

Work numerically on the partial differential equations using different methods through the theory of finite differences.

BCA-403 - Java Programming

CO1: The students will have the competence in the use of Java Programming language.

CO2: The development of small to medium sized application programs that demonstrate professionally acceptable coding.

CO3: The students will have the competence in the use of Java Programming language.

CO4: An understanding of the principles and practice of object oriented programming in the construction of robust maintainable programs which satisfy the requirements.

CO5: Design and implement an application that demonstrates their competency with Java syntax, structure and programming logic, incorporating basic features of the language as well as some features from the I/O (Input/Output) or GUI libraries.

CO6: Competence in the use of Java Programming language in the development of small to medium sized application programs that demonstrate professionally acceptable coding and performance standards.

BCA-404 - Software Engineering

CO1: Understand the importance of the stages in the software life cycle.

CO2: Understand the various process models.

CO3: Be able to design software by applying the software engineering principles.

BCA-405 - Data Mining & Data Warehousing

CO1: Have a deeper understanding of database systems and their underlying theory to be able to improve the decision-making process.

CO2: Understand the technology of data warehousing.

CO3: Understand data mining concepts and techniques.

BCA-406 - Communication Skills- Scientific & Technical Writing

CO1. Understand how to apply technical information and knowledge in practical documents for a variety of a.) Professional audiences (including peers and colleagues or management) and b) public audiences.

CO2. Recognize, explain, and use the rhetorical strategies and the formal elements of these specific genres of technical communication: technical abstracts, data based research reports, instructional manuals, technical descriptions, web pages, wikis, and correspondence.

CO3. Participate actively in writing activities (individually and in collaboration) that model effective scientific and technical communication in the workplace.

recognize, explain, and use the rhetorical strategies and the formal elements of these specific genres of technical communication: technical abstracts, data based research reports, instructional manuals, technical descriptions, web pages, wikis, and correspondence. Revise and edit effectively in all assignments, including informal media (such as email to the instructor).

Collect, analyze, document, and report research clearly, concisely, logically, and ethically; understand the standards for legitimate interpretations of research data within scientific and technical communities.

BCA-407 - Java Lab

CO1. Student should know the model of object oriented programming and fundamental features of an object oriented language.

CO2. Student should know how to test, document and prepare a professional looking package for each business project.

CO3. Student have the ability to write a computer program to solve specified problems and to use the Java SDK environment to create, debug and run simple Java programs.

CO4. Student will be able to explain and develop programs for inheritance, multithreading, applets, exception handling and file handling.

BCA-408 - S.E. Lab

CO1. Create models for software applications.

CO2. Use the different UML notations for designing software.

BCA-409 - C.T Lab/ Seminar

CO1. Improvement in proficiency in English

CO2. Improvement in presentation skill

CO3. Improvement in analytical and reasoning ability

CO4. Improvement in technical writing

BCA-501 - Computer Network

CO1: Explain the importance of data communications and the Internet in supporting business Communications and daily activities.

CO2: Explain how communication works in data networks and the Internet.

CO3: Recognize the different internetworking devices and their functions.

CO4: Explain the role of protocols in networking.

CO5: Analyze the services and features of the various layers of data networks.

BCA-502 - System Software

CO1: Understand SIC architecture, features of utility software's such as assemblers, loaders, linkers, editors and macro processor.

CO2: Design simple assembler for Simple instruction computer.

esign linker and loaders for simple instruction computer.

Design elementary macro processor for simple assembly level language.

: Design and implement simple laxer and parser using lex and yacc tools.

BCA-503 - Advance Internet Programming

CO1: Analyze a web page and identify its elements and attributes.

CO2: Design, Format and validate web pages in ASP.

CO3: Build dynamic web pages using ASP.

CO4: Create Database using ADO.

CO5: Create XML documents used in Web Publishing.

CO6: Design web sites and deploy it on web servers.

BCA-504 - Advance Java

CO1 Develop Swing-based GUI.

CO2: Develop client/server applications and TCP/IP socket programming

CO3: Update and retrieve the data from the databases using SQL

CO4: Develop component-based Java software using JavaBeans.

CO5: Develop server side programs in the form of servlets.

BCA-505 - Computer Graphics

CO1: Students will demonstrate an understanding of contemporary graphics hardware.

CO2: Students will create interactive graphics applications in C++ using one or more graphics.

CO3: Students will create interactive graphics applications in C++ using one or more graphics application programming interfaces.

CO4: Students will write program functions to implement graphics primitives.

CO5: Students will write programs that demonstrate geometrical transformations.

BCA-506 - E-Commerce

CO1: Have knowledge of e-commerce, its components, structure of e-banking, rules and regulations on e-commerce.

CO2: Acquire a good knowledge of e-commerce, both the technical and business aspects;

CO3: Understand the principles and practices of e-commerce and its related technologies;

CO4: Discuss the trends in e-Commerce and the use of the Internet.

CO5: Explain the economic consequences of e-Commerce.

BCA-507 - Computer Advance Internet Programming Lab

CO1: Design and deploy web application using servlets.

sign and deploy web application using JSPs.

Design and deploy web application using Ajax.

CA-508 - Advance Java Lab

CO1. learn the Internet Programming, using Java Applets

CO2. create a full set of UI widgets and other components, including windows, menus, buttons, checkboxes, text fields, scrollbars and scrolling lists, using Abstract Windowing Toolkit (AWT) & Swings

CO3. Apply event handling on AWT and Swing components.

CO4. Learn to access database through Java programs, using Java Data Base Connectivity (JDBC).

CO5. Create dynamic web pages, using Servlets and JSP.

CO6. Make a resusable software component, using Java Bean.

CO7. Invoke the remote methods in an application using Remote Method Invocation (RMI) CO8.understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).

BCA-601 - Advance Computer Network

CO1: Illustrate reference models with layers, protocols and interfaces. & Summarize functionalities of different Layers.

CO2: Combine and distinguish functionalities of different Layers

CO3: Describe and Analysis of basic protocols of computer networks, and how they can be used to assist in network design and implementation

CO4: Identify and describe development history of routing protocols

CO5: Describe Sub-netting and Addressing of IP V4.LT

BCA-602 - Management Information System

CO1: Students would be able to understand the usage of MIS in organizations and the constituents of the MIS.

CO2: The student would understand the classifications of MIS, understanding of functional MIS and the different functionalities of these MIS. This would be followed by case study on Knowledge management.

CO3: This module lead to linking MIS to business strategy and the areas in which MIS would lead to strategic advantage. This would be followed by case study and guest lecture.

CO4: The student learns the functions and issues at each stage of system development. Further different ways in which systems can be developed are also learnt.

CO5: This module provides understanding about emerging MIS technologies like ERP, CRM, SCM and trends in enterprise applications.

BCA-603 - Artificial Intelligence

CO1: Demonstrate knowledge of the building blocks of AI as presented in terms of intelligent agents.

CO2: Analyze and formalize the problem as a state space, graph, design heuristics and select amongst different search or game based techniques to solve them.