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CRITERIA 2.6.1

2.6.1. Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website and attainment of POs and COs are evaluated

2.6.1 Index

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Teaching-learning and Evaluation

Key Indicator 2.6

Student Performance and Learning Outcome

2.6.1.

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Sr.No	Particulars
1	Vision & Mission statement of college
2	Program outcomes (POs)
3	Course Outcomes (COs)
4	Course Outcomes of B.A
	Course Outcomes of B.SC
5	Communication of Vision, Mission, POs, and Cos

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Vision & Mission statement of college

Vision:

To emerge as a leading 'Centre for Excellence' in the field of 'Arts and Science' and evolve world class professionals to serve healthcare needs of an ever changing global society."

- To emerge as a leading centre
- To impart quality Higher Education
- To offer Research and Consultancy
- To conduct professional training
- To undertake societal transformation

Mission:

"To impart excellent and quality education through value-based system to produce not just global professionals but ingenious thinkers in the field of Art and Science."

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Po's of B.A Programme(Program Outcome)

Generic and Domain Knowledge - Ability to articulate, illustrate, analyze, synthesize and apply the knowledge of principles and frameworks of management and allied domains to the solutions of real-world complex business issues

Problem Solving & Innovation - Ability to Identify, formulate and provide innovative solution frameworks to real world complex business and social problems by systematically applying modern quantitative and qualitative problem solving tools and techniques.

Critical Thinking - Ability to conduct investigation of multidimensional business problems using research based knowledge and research methods to arrive at data driven decisions

Effective Communication - Ability to effectively communicate in cross-cultural settings, in technology mediated environments, especially in the business context and with society at large

Leadership and Team Work - Ability to collaborate in an organizational context and across organizational boundaries and lead themselves and others in the achievement of organizational goals and optimize outcomes for all stakeholders.

Global Orientation and Cross-Cultural Appreciation - Ability to approach any relevant business issues from a global perspective and exhibit an appreciation of Cross Cultural aspects of business and management.

Entrepreneurship - Ability to identify entrepreneurial opportunities and leverage managerial & leadership skills for founding, leading & managing startups as well as professionalizing and growing family businesses.

Environment and Sustainability - Ability to demonstrate knowledge of and need for sustainable development and assess the impact of managerial decisions and business priorities on the societal, economic and environmental aspects

Social Responsiveness and Ethics - Ability to exhibit a broad appreciation of the ethical and value underpinnings of managerial choices in a political, cross-cultural, globalized, digitized, socio-economic environment and distinguish between ethical and unethical behaviors & act with integrity.

LifeLong Learning – Ability to operate independently in new environment, acquire new knowledge and skills and assimilate them into the internalized knowledge and skills.

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Po'S of B.Sc Programme(Program Outcome)

Knowledge: Learners are encouraged to apply the knowledge of mathematics and science fundamentals to various solutions of complex problems. As such, knowledge of the subject is the sole objective of any student learner. A student is exposed to a wide range of topics in various subjects and is given intensive training in each of the courses that have laboratory related work

Problem Analyses: Well equipped with an understanding of the analytical methods involved, they are in a position to interpret and analyze results so obtained from experiments and draw suitable conclusions against their supported data acquired. At the end of the program, students will be able to identify, formulate and analyze scientific problems and reach concrete solutions using various principles of mathematics and sciences.

Designing Solutions: Having acquired knowledge of subjects, students are trained to think out of the box, design and conduct an experiment or a series of experiments that demonstrate their understanding of the methods and processes involved. For example, as a part of the project of the final year, students in the subject of Physics are encouraged to calculate the overall power consumption of the institution and think of ways and means of minimizing this consumption through alternate sources of energy.

Modern tool usage: As an outcome of PO-1, PO-2 and PO-3, learners are trained to create, select, and apply appropriate techniques, resources and IT tools in the analysis and synthesis of data within limitations. (Outcome of final year project).

Communication Development: The medium of instruction being English, proficiency in the subject through English is one of the primary objectives of the science program. In order to improve the writing and oral skills of learners, the program caters to ensuring that learners become effective, clear communicators in written and oral work and are capable of explaining complex issues in accessible terms.

Employability: With our learner's long-term professional pursuits being quite varied, many are drawn to careers that require scientific skills or technical expertise or strong quantitative reasoning abilities. Keeping this in mind, the institution apprises students of various employment opportunities that are available in areas of their choice through the Placement cell.

Ethics: While it is necessary to instil the spirit of competitiveness among students in a world of increasing competition, it is equally vital to develop a strong sense of ethics among learners that will help them develop some positive attitudes and values. This includes appreciation of the various principles and theories that evolved in science, the impact that science has on social, economic and environmental issues. One of the main objectives of any academic exercise,

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therefore, should be to produce well-groomed individuals who understand the significance of ethical values and abide by them even in the most pressing circumstances.

Environment and Sustainability: 'Environmental sustainability' has become the watchword of the 21st century. An increased engagement with environment related concerns is appearing tangibly on global fronts; academics cannot and should not remain quarantined from this massive development. Through classroom discussions and research projects, this programme facilitates active dialogues with factors which influence human-ecology interactions.

Soft-Skill Development: Apart from the attainment of knowledge and hand son skills in practical applicability of the subject, learners need to be equipped with soft-skills and values which will help them function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary groups. These soft skills include leadership, teamwork, project-management, positive outlook, innovative approaches and effective articulation

Science and Society: As an outcome of PO-1, PO-2 and PO-3, learners are encouraged to apply logical reasoning based on the knowledge, skills, designing solutions to assess societal, health, safety issues and the responsibilities that go along with the scientific practice

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Program Specific Outcomes (PO's)

B.A. (SOCIOLOGY) PROGRAM SPECIFIC OUTCOMES

This programme enables students to enter the second year of B.A. degree programme. Every student has to pass this programme to complete his three-year degree programme. Three subjects astudents opts for his/her B.A. degree each subject includes two compulsory papers in the 1st year of B.A. degree programme. Hence a student gets comprehensive knowledge about at least two branches of each subject.

Course Outcomes

Class: - B.A. I Year

Paper-I **Sociology**

Basic Concepts of Society

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Sociology – Meaning, Definition, Nature, Scope, Subject Matter, Importance, Sociology and other Social Science	1. To make conscious efforts to drive home the relevance and significance of sociology for understanding society. 2. To serve as preparation for careers in various fields as teaching, administration, journalism, environment and other various applied arts and sciences 3. Exercise the sociological imagination — observing the relationship between individuals and historical, cultural, and social forces. 4. The ability to demonstrate sociological understandings of phenomena, for example, how individual biographies are shaped by social structures, social institutions, cultural practices, and multiple axes of difference and/or inequality. 5. The ability to demonstrate knowledge of some of the key substantive areas within the field of sociology.
II	Society, Social Groups, Community, Institutions, Associations	
III	Social Structure, Status, Role, Culture, Socialization.	
IV	Social Control, Values, Norms, Social Stratification, Social Mobility	
V	Social Change – Meaning, Types, Evolution, Development, Progress, Revolution	

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Class: - B.A. I- Year **II- Paper** **Sociology**

Indian Society

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Dharma, Varna System, Ashram System, Purushartha, Karma, Sanskars	1. To make conscious efforts to drive home the relevance and significance of sociology for understanding past and present society. 2. To serve as preparation for careers in various fields as teaching, administration, journalism and other various applied arts and sciences. 3. The ability to demonstrate sociological understandings of phenomena, for example, how individual biographies are shaped by social structures, social institutions, cultural practices, and multiple axes of difference and/or inequality. 4. Analyze how numerous sociological events impact their own lives, their families, andcommunities, and how it impacts the larger society. 5. The student will be able to acquire knowledge about Caste, Class and Tribes in India
II	Caste, Class, Family, Marriage, Kinship	
III	Structure of Indian Society, Village, City, Rural- Urban Continuum, Diversity of Indian Society – Demographic, Cultural, Religious, Linguistic	
IV	Family Problems – Dowry, Divorce, Domestic Violence, Problems of the elderly, Youth Tension.	
V	Social Problems – Casteism, Regionalism, Communalism, Cyber-crime, Gender Inequality.	

Class: - B.A. II Year **Ist Paper** **Sociology**

Social Processes and Change

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Social Structure and Function according to Redcliffe Brown and T. Parsons	1. To make conscious efforts to drive home the relevance and significance of sociology for understanding past and present society. 2. To serve as preparation for careers in various fields as teaching, administration, journalism and other various applied arts and sciences. 3. The ability to demonstrate sociological understandings of phenomena, for example, how individual biographies are shaped by social structures, social process, social organisation and disorganisation etc. 4. Analyse how numerous sociological concepts impact their own lives, their families, and communities, and how it impacts the larger society. 5. The student will be able to acquire knowledge about cooperation, accommodation, assimilation, adaptation, adjustment, conflict, competition, deviant behaviour, war, etc.
II	Social Organization and Social Process	
III	Social Disorganization and Process of Social Disorganization	
IV	Social Legislation	
V	Process of Social Change	

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Class: - B.A. II Year **II- Paper, Rural,** **Sociology**

Urban and Tribal Society

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Rural and Peasant Societies	1. To make conscious efforts to drive home the relevance and significance of sociology for understanding society. 2. To serve as preparation for careers in various fields as teaching, administration, journalism and other various applied arts and sciences. 3. The ability to demonstrate sociological understandings of phenomena, for example Cooperatives, Rural Women, Panchayati Raj, Housing, Slums, Juvenile Delinquency, Alcoholism, Drugs, Addiction, Pollution, Crime, Poverty, Unemployment, etc. 4. Analyse how numerous sociological concepts impact their own lives, their families, and communities, and how it impacts the larger society. 5. The student will be able to acquire knowledge about causes of Social Disorganization, Corruption, Tribal Problems, Indebtness, Land Alienation, and Life Style of Gond, Bhil, Bhilala, and Korkus, etc.
II	Rural Leadership and Factions	
III	Urban Society – Social Organization	
IV	Urban Society – Social Disorganization	
V	Tribes	

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Class: - B.A. III Year **I- Paper** **Sociology**

Sociological Thinkers

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Auguste Comte, Emile Durkheim, Ptirim Sorokin	1. To make conscious efforts to drive home the relevance and significance of sociology by understanding the views of Social Thinkers. 2. To serve as preparation for careers in various fields as teaching, administration, journalism and other various applied arts and sciences. 3. The ability to demonstrate sociological understandings of phenomena by understanding the various concepts given by Social Scientists. 4. Analyse how numerous sociological concepts impact their own lives, their families, and communities, and how it impacts the larger society.
II	Max Weber, Karl Marx, Thorstein Veblen	
III	R. K. Merton, Vilfredo Pareto, G. H. Mead	
IV	Mahatma Gandhi, Radhakamal Mukherjee, Dr. B. R. Ambedkar, G. S. Ghureye	
V	M. N. Srinivas, A. R. Desai, Yogendra Singh	

Class: - B.A. III Year **IInd Paper** **Sociology**

Methods of Social Research

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Social Research and Social Survey	1. To make conscious efforts to drive home the relevance and significance of doing research in sociology. 2. To serve as preparation for careers in various fields as research, teaching, administration, journalism and other various applied arts and sciences. 3. The ability to demonstrate sociological understandings of phenomena, for example Scientific, Method, Research Methods, Facts, Basic Process of Research, Hypothesis, Research Questions, theories etc. 4. With the help of Research Analysis see how numerous sociological concepts impact their own lives, their families, and communities, and how it impacts the larger society. 5. The student will be able to acquire knowledge about qualitative and quantitative methods of research, likert and bogardus scale, questionnaire and interview techniques, calculating mean, median, mode, etc.
II	Research Methodology and Techniques of Data Collection	
III	Scaling Techniques and Report Writing	
IV	Statistics and Central Tendency	
V	Presentation of Data and Use of Computer in Social Research	

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Class: -BA I Year 1st -Paper **Economics**

Micro economics

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Definition and scope and nature of Economics nature resources land water lily stop and forest.	Students will be able to learn Introduction and importance of economics.
2	Law of demand and its expectation giffen goods.	Students will be able to learn Effect of price in demand of law.
3	Law of supply and elasticity of supply.	Students will be able to learn Effect of production for supply of law.
4	Meaning and classification of market and perfect market.	Students will be able to learn about Meaning of market and types of market.
5	Theory of rent and interest.	Importance of Rent and interest of Economics.

Class: - BA I Year Paper 2nd **Economics**

Indian Economics

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Characteristics of Economics.	Aware about Economics function of water land and Agriculture.
2	Nature importance of electric characters of Indian agriculture.	Importance of agriculture of economy.
3	New industrial policy of 1991.	Globalization and privatization of government sector.
4	Role of foreign direct investment.	Importance of International Trade of FDI.
5	Natural resources of Madhya Pradesh land forest water and mineral.	Roll off nature resources of MP.

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Class: -BA II Year Paper 1st **Economics**

Macro Economics

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Concept of macroe conomics between micro and macro.	Definition and difference of macro and micro economics.
2	Classical theory of employment.	JB se theory of market.
3	Investment function and affecting investment.	Meaning of investment function and effect of market.
4	Money meaning and function.	Meaning and types of money.
5	RBI Bank meaning and types.	The role of RBI in Indian Economics.

Class: -BA II Year **Paper 2nd** **Economics**

Public Finance international economics

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Kind of Texas introduction of goods and service tax GST.	General introduction of GST and types of GST.
2	Budget definition and preparation.	Budget importance and role of Indian economy.
3	Meaning and importance of international economics.	Importance of International Trade of Economics sector.
4	World Trade Organization WTO.	Role of WTO in international trade.
5	Theory of exchange rate.	Concept of appreciation and depreciation of currency.

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Class: -BA III Year **Paper 1st** **Economics**

Development and Environment economics

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Network concept of characteristics of development in country.	Characteristics of problem of developing countries.
2	Theory of economics development Adam Smith.	Adam Smith theory roll of economics development.
3	Theory of big pose rodan.	Growth developing countries role of big push theories.
4	Development techniques capital and Labor techniques.	Benefit of capital and Labor techniques and theories effect.
5	Concept of Sustainable development.	Importance of sustainable development.

Class: - BA III YearPaper 2nd **Economics**

Statistics second level

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Meaning and definition of statics.	General concept and importance of statistics.
2	Measures of Central tendency mean - Median Mode.	Role of measures of Economics. tendency Of
3	Correlation.	Importance of two several Of correlation.
4	Concept number. of index	General concept of index number.
5	Concept of role of probability.	Types of probability.

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Class: - BA I Year II Paper **Political Science**

India Government and Politics

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Brief History of the Movement Formation of the Indian Constitution and their sources Preamble of the Indian Constitution Salient features of the Indian Constitution	Brief History of Indian National Movement as well as Constitution after Independence
2	Fundamental Rights and Duties, Principles of State Policy Federal Executive President's Cabinet Prime Minister	Along with Fundamental Rights and Duties, the Directive Principles of State Policy were explained to the students.
3	Indian Parliament Lok Sabha Rajya Sabha Supreme Court Center State Relations Election Commission	Children were told how the proceedings of Lok Sabha and Rajya Sabha are conducted in the Indian Parliament, as well as how the Supreme Court discharges its responsibility by being neutral.
4	State Government Executive Governor Council of Ministers and Chief Minister State Legislative Assembly and Legislative Council	How the executive discharges its responsibilities in the state government, information was provided to the students about the responsibilities of the fellow governor and the chief minister in the cabinet.
5	Political parties National and regional parties Caste religion language regional in Indian politics so that the role of poverty eradication and electoral reforms	Along with the national and regional parties, information was provided to the students about electoral reforms from caste religion language to eradication of poverty.

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Class: - BA II Year II Paper **Political Science**

Constitution of major countries

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Their Features Features of the Constitution of Britain	Features of the British Constitution Along with this the difference between King and Crown
2	Features of the US Constitution	The main features of the US Constitution, as well as the powers of the President, as well as the executive, legislature and judiciary, and the Senate were told to the students.
3	Features of the Constitution of Switzerland	The main features of the constitution of Switzerland, along with the executive legislature, the judiciary, were explained to the students about the direct democracy
4	Features of the Constitution of People's China	Along with the main features of Democratic China, the students were made aware about the communist system and executive and legislature there.
5	comparative study	In the last minute, students are asked to do a comparative study of the President of America and the Prime Minister of the British and the Senate of America and the House of Lords and the General Assembly and China and other parties.

Class: - BA II Year I Paper **Political Science**

Representative Political Thinkers

Unit	Course Content	Learning Outcome: - AfterCompletion of Course student will able to-
1	Salient features of Indian political thought-Manu, kautilya and Buddhist tradition.	Features of Ancient Indian Political Thought Made the students aware of Kautilya'sSaptang Principle.
2	Salient features of western political Thought-Plato and Aristotle-plato and Aristotle.	The students were made aware about the characteristics of councilor political thinking.

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3	Salient features of modern political thought- Machiavelli,Hobbes,Locke, Rousseau, Jeremy Bentham, John S.Mill.	Introduced the students about why Machiavelli is called the infant of the modern age, explained the principle of utilitarianism of fellow Germy Bentham, how happiness and sorrow are part of human life.
4	Communist thinkers: Mark, Lenin and M.N.Roy.	The communist thinker will explain to the students about Marx's dialectical materialism as well as explain the theory of class struggle in which the rich are getting richer and the poor are getting poorer.
5	Indian political thinkers: Mahatma Gandhi, Dr. B.R.Ambedkar, Ram Manohar Lohiya ,and Pt. DeendayalUpadhyay.	Mahatma Gandhi's non- cooperation movement in Indian Indian political ideas, civil disobedience movement Quit India movement, along with Ambedkar's social hospital, will explain to the students about fellow Deendayal

Class: BA I Year I Paper

Political Science

Basic Principles of Political Science

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Meaning of Political Science, Nature Field and Relationship of Political Science with other Social Sciences	Meaning definition of political science along with other social sciences sociology history make students aware about the relation of political science with psychology and geography
2	State and State Principles	Students were made aware about the different theory of origin of state along with definite Bhopa government and sovereignty.
3	rights and duties	Rights and duties along with liberty, equality, justice, public welfare, state power and authority were explained to the students.
4	type of government	Types of Government in a Unitary Federal Parliament Atma Students were informed about Presidential Government
5	Political Parties Over Pressure Groups	Information was provided to the students about national and political parties and pressure groups in political parties.

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Class: BA III Year I Paper **Political Science**

India Foreign Policy

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	India's Foreign Policy	Good India The determining elements of the meaning of India's foreign policy were explained to the students on questions of national interest and in addition diplomacy.
2	India's relations with neigh boring countries	The students were made aware of the development of India's foreign policy in the context of India's foreign policy and its salient features.
3	Relations with the great powers of India	The principles of India's foreign policy were widely conveyed to the children about the purpose of foreign policy.
4	regional organization	What is the basic fundamental of India's foreign policy, what is the geographical conditions of the historical, cultural and how it was created in the international dialogue, the students were made aware? of it.
5	Contemporary International Issues	The students were briefed on India's foreign policy towards other neigh boring nations as well as India's relations with Afghanistan with other neigh boring nations such as Bangladesh Bhutan Nepal Nepal Myanmar.

Class: BA III Year II Paper **Political Science**

Public Administration

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
1	Public administration	The meaning of public administration is the nature and the difference between the region and public administration and private administration and the new public administration.
2	Principles of Organization	The students were explained in detail about how the main executive discharges its responsibilities, etc.

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3	Personnel administration	Recruitment Training in Public Service After their promotion, the students were briefed about the Public Service Commission and union public service commission.
4	Finance administration	How the budget is prepared, how the accounts and accounts are done, etc., were explained in detail to the students.
5	Development administration	The students were explained in detail how the bureaucracy plays its role in development administration as well as the role of Panchayati Raj Institutions at the local level and how the Lokpal and Lokayuktas function and what is e- Governance.

Course Outcome

Class: BA I year 1 paper **History**

Sub – **History of India and from earliest times to 1200 A.D**

Unit	Course	Learning outcome- after completion of course student will able to -
I	Its Concept Nature & Significance, Physical & Geographical Structure Of India, pre Historic age and stone age .	Got information about ancient Indian history get acquainted with the geographical structure of india.
II	Saraswati civilization – Origin, extent , decline , social economic & culture life, megalithic culture , economy , culture and religion , later vedic period – social condition – varna, jati.	In india complete information about physical religion which was acquainted with the ancient civilization was abtained.
III	Sixteen mahajanpads, rise of Magadha, invasion and its impact; the mauryanemire-chandraguptashoka dhamma, downfall of maurayan empire, post mauryan period: foreing invader – shakas and kushanas.	Gat knowledge of the objectives of Jainism knowledge of mouryan and governance familiar with the personality of ashoka the great.
IV	Gupta empire, political, social, economic and cultural life, vakataka, dynasty, gurjar-pratihar, history of Kashmir-karkot and lohar dynasty.	Of the Gupta empire.
V	Important dynasties of south indiarashtrakutas, cholas, pallavas and chalukyas – social economic , cultural life, mohammad –bin-qasim , turkinsh invasion mahmudgazanvi and mohammadghori .	Will propagating Indian culture in the word its knowledge was found in schools.

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B.A- I Year II paper **History**

Western World (mid-15th century to 1870)

Unit	Course content	Learning outcome –after completion of student will able to--
I	Sources of medieval Indian history foundation and consolidation of Delhi sultanate –QutubuddinAibak and Iltutmish razia and balban, the khiljirevolation Alaudd inkhilji his conquest and reforms the mongolinvation	Society information is received about the is istablishment of razia sultan the first woman ruler of india
II	Mohammad bin Tughluq firozshahtughlaq decline of delhisultanatvijaynagar and bahamani kingdoms Timur invasion and its impact lodhi dynasty invasion of the mughals, babarhumayun and sher shah surirul off rana kumbha and rana sana in Indian history	Attention was paid to the Agriculture industry which was done for protection of the Delhi sultan from forgin invasion
III	Akbar -consolidation and territorial expansion of the Mughal empire his religious and ruajput policy Jahangir shahjahanmughul –sikh relation rise of marathasshivaji his conquest and administration Aurangzeb and the decline	The hindumuslim general who were acquainted with the establishmemt of nationality during the period of akbar become familiar from there
IV	Sufi movemenets the sant tradition in india during sultanate period- agriculture, industry, trade, economic and administrative system.	Familiar with the administration system gat acquainted with the unique specimen of architecture art.
V	Mughal administration mansubdari system social and religious life status of woman economic life agriculture trade commerce and architecture during mughul period role of Rani Durgawatijijabai and chandbibi in history	The tradition arrived at the end of india familiar with the movement in the social and religious fields

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Class B.A. II PAPER-I History of India (1200 to 1739) **History**

Unit	Course	Learning outcome- after completion of course student will able to -
I	The beginning of modern Era- Renaissance, decline of Feudalism, Reformation and counter Reformation Economic Revolution of the modern West - Mercantilism and Commercial Revolution beginning of Colonialism	Become acquainted with the socio- economic political situation of is the century
II	Industrial Revolution. industrial revolution in England causes and impact on society, industrialization in other countries USA, Germany, Russia,Japan.Glorious revolution of 1688 A.D.	What was the impact of the industrial revolution the word on other countries
III	American Revolution (1776 A D.) Cause and effects,French Revolution - nature causes and effects. and its aftermath	The hindus ,who were acquainted with the establishment of unit during the period of Akbar become familiar with the muslim general
IV	Age of Napoleon Bonaparte- Rice and fall, Vienna Congress (1815), age of metternich, Revolution of 1830 and 1848 A.D .and their impact over Europe, Eastern question up to Crimean war.	Become familiar with the movement in social and religious field different from the end tradition of India
V	Liberalism In England - act of 18.32 and Chartist movement , act of 1867 A.D . , American civil war , with reference to Abraham lincoln and the abolition of slavery, Napoleon III unification unification of gramany and Italy.	Due to liberalism in the world specially in England , the movement against power in may countries got information about its mode of work

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Class B.A. II PAPER 2 **History**

Main Currents of World history from 1871 to 2001 A.D

Unit	Course content	Learning outcome –after completion of course student will able to-
I	Third republic of France, Kaiser William I, home and foreign policy of Bismarck Kaiser William II.	The word has been divided in to two factions has had adverse consequences perhaps the information of the diplomacy is obtained.
II	Africa and turkey –scramble for Africa Eastern Question Russo –Turkish war Berlin congress (1878),Young Turk movement and the Balkan wars I and II Russian revolution	Injustice anarchy led to revolution movemen t
III	Europe –fist Word war –causes and result Russian revolution 1917 ,Wilson s fourteen principal pairs peace conference Treaty of Versailles League of Nation	A National federation is establishment for the peace of the word that should be establishment after being aware of the affect of the
IV	China and Japan Imperialism and colonialism in china Japan first & second Opium wars taiping rebellion Boxer movement Chinese Revolation - 1911, demands for concession in china Japan – the meiji restoration modernization of Japan rise of militarism Russo Japanes war 1905 Sino –Japanese war 19327 Fascism in Italy	It is know that the word has become in the completion of colonialism and socialism
V	The Chinese Revolution of 1949 emergency of third word and non – alignment UNO and global, dispute ,Cold war ,end of the cold war	Information about the origin of non alignment is obtained

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Class: BA III year 1 paper **History**

History of India from 1740 to 1857 A.D

Unit	Course	Learning outcome- after completion of course student will able to -
I	Sources of modern Indian history political trends in the mid 18th century, Advents of Europeans in India , Anglo — French conflict in Karnataka, third Battel of Panipat. Establishment of East India company in India , battle of Plassey and Buxar , diwani of Bengal, Bihar and Orissa , dual government.	The arriral of erupean companies in the in the 18th century was first repotet in by shri ganesh of britishepire
II	Growth of colonial administration – warren hastings and lord Cornwallis, regulating Act. Pitts'sindia Act. Charter Act of 1813&1833 A.D , anglo – maratha relations , anglo – mysoreretation ,Wellesley and the subsidiary alliance.	Constitution history evolation from ane to establishment of low and order
III	Maharaja ranjitsingh and anglosich relation , lord hasting and british paramount , downfall of Marathas, anglo – Burmese relation , anglo – afghan relation , lorddbalhousie and doctrine of lapse , his administration and reforms , resistance to the british rule, various peasant and tribal movement , first of woman in freedom struggle – laxmi bai a awanti bai , jhalkari bai .	the nutritional result to the Indian by the British government will be the first sleep sadhguru,sshreeganeshawa nk ened the patriotic spirit of the student
IV	Indian Renaissance , Socio – Religious Movements- raja rammohanroy and brhamasamaj , lord william Bentinck , devendranathragore , ishwarchandravidhasagar , datyanandsaraswati , Islamic revivalism feraizi and wahabi movements, status of women , the state of indigenous education, growth of western education , modernization of india, conspiracy of lord macauley ,the downward filteration theory.	There was awareness in the society about the movement launched by the Indian social reformer in various fields
V	British land revenue settlement – permanent settlement , ryatwati and mahalwari system , condition of peasants , rual indebtedness , commercialization of agriculture , dain of wealth , decline of cootage industries , economic transformation of india , communication network telegraph and postal services and railways.	Work in the interest of Indian in revenue and territories by the British Government

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Class: BA III year **2nd paper** **History**

History of India from 1858 to 1950 A.D

Unit	Course	Learning outcome- after completion of course student will able to -
I	Queen Victoria's proclamation, act of 1858 , Indian council act 1861 , internal administration of lord Lytton and Ripon, political association and the Indian National Congress , India counselling act of 1892.	By the act 18 to 58 the beginning of British rule over India was introduce with the Establishment of the Indian nation congress.
II	Load curzon and the partition of Bengal, Swadeshi movement, moderates, extremistesand revolutionary movement India and abroad. government act of India-1909, peasant and tribal movement, Home rule movements, Lucknow pact,Rowlat Act, Jallianwalam Bagh massacre, government of India act 1919 and dyarchy .Ieftism in India and congress and communists party of India.	The movement of Indian for independence intensified.
III	Gandhian era, khilafat and non cooperation movement swarajists. Simon commission Lahore Congress. Civil disobedience movement, round table conferences. Government of India act 1935 and provinical autonomy. Quite India movement. role of women and youth in the India national momentum.	Got information about the personality of Gandhiji how did he work freedom.
IV	Cripps mission , Simla conference , cabinet mission , Subhas Chandra Bose and the INA, communal politics and partition of India, Indian independence ACT 1947. role of pricely state in the Indian National movement. Integration of India princely state. Main features of the India constitution.	Haw did independence come and the partition of india made the constitution of india.

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English

Class- B.A. III **English Lit. I**

Unit	Course Content	Learning Outcome :- After of Course student will able to-
I	Alfred Tennyson first five cantos	Student will able to know about Victorian era. Why Victorian era considered as the golden age
II	V.B. yeats A prayer for my daughter the second coming Sailing to byzanlium among school children	Students go the stream of knowledge from modern poetry use of free metrics
III	T.S. Eliot – The love song of J.Alfred Burnt Norton	Modern Poetry with classism. Eliot's role in the literalive .
IV	W.H. Auden in memory of W.B. Yeats the unknown citizen .	Poasic poetry tinge of realism in Morden poetry.
V	Philip lakin – A.K. Ramanujan	Next Please Deceptions, A river, obituary Ideas on Periodic+. thought and Contemporary thought

Class- B.A. III Subject: - **English Lit. II** Session – 2020-21

Unit	Course Content	Learning Outcome :- After of Course student will able to-
I	Joseph Conra d Lord Jim	Come to know about the various auspeats of modern fiction.
II	DH Lawrence Sons and lovers	Contribution of D.H. Lawrence as an cssayist .
III	E.M. Froster A passage to india	Great fiction writer , Indian, Panorama , role and characters.
IV	Raja Rao Kanthapura	Students come to know about the Indian writing in English.
V	V.S. Naipal A vtouse of Mr. Biswas	Students come to know about the Indian writing in English.

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Class- B.A. II **Subject: - English Lit. II** **Session – 2020-21**

Unit	Course Content	Learning Outcome :- After of Course student will able to-
I	Henry Fieldin g Tom Jones	Students come to know about the Golden Gems of fiction.
II	Jane Austin prid e and prejudice	Morden age drama :- Social Political and moral reflection in the Novel by Austin
III	Charles sickens: - Hard Timse	Provide the Literary trends of conertemperary
IV	Thomas Hardy :- Tess of the d' urbervilles	Pessimismoptimism in liherative .
V	V.S. Naipal A vtouse of Mr. Biswas	Students come to know about the Indian writing in English

Class- B.A. I **Subject: - English Lit. II** **Session – 2020-21**

Unit	Course Content	Learning Outcome :- After of Course student will able to-
I.	Prose and its forms	Brief history of prose, essay ,prose, sketch fiction , drama etc.
II.	From as bacon of studies of travel of love of revenge .	Students learnt an of composing essays.
III.	Joseph Addison sir rogeral church sir rogeral at home th e adventures of a shilling	How Indian essay: - prose style is same but subject matter is different .
IV.	Charles lamob:- a bachelor' s complain of the behaviour of married people .	Student learnt how to reflect autobiographical elements In the essay.
V.	A.G. gardinar on saying pleas e H.G. wells :- the stoles bacillus .	Students learnt how to spilt ink into the paper on various life related topics.

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Class- B.A. I **Subject: - English Lit. I** **Session – 2020-21**

Unit	Course Content	Learning Outcome :- After of Course student will able to-
I.	Drama and its terms the Renaissance: Eligabathen and Jacobean drama 20th century drama	Through this unit students got information and knowledge about 20th century literary epitome.
II.	William Shakespeare the king Lear the Pempest	Got the knowledge of Eligabathen age.
III.	Henric Ihsen A doll's house	Come to know about the tragic comedy style.
IV.	John obsorne: Look back in anger	How to reflects central character.
V.	Samuel Becket waiting for Godot.	The role of central attractive theme.

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Class - B.Sc/ B.A.-2-year **Environment Study (FC)**

Unit	Course Content	Learning outcome – After Completion of course student will able to:
I.	**STUDY OF ENVIRONMENT AND ECOLOGY** - Definition and importance, public participation and public awareness, ecology- introduction, ecosystem - concepts components.	1. Student understands the concept, component, structure& function of ecosystem. 2. Student understood the importance of environment and made people aware about it.
II.	**ENVIRONMENT POLLUTION AND POPULATION** – Air, water, noise heat and nuclear pollution, population growth, family welfare programme, environment and human health.	1. The student understood how pollution spreads in the environment and how it can be stopped. 2. Student understood different types of pollution. 3. The student understood the reason for population growth and made people aware about population control and for that they did many program 4. Student also learned how to dispose ofhouse hold waste.
III.	**NATURAL RESOURCES, PROBLEMS AND CONSERVATION**-Water resources, forest resources, land resources, food resources, energy resources,	1. The student has to know what the natural resources are and how they should conserve. 2. The student understood the importance of using solar energy instead of convention energy resource
IV.	**DISASTER MANAGEMENT AND ENVIRONMENTAL LAWS** –disaster management – food earthquake, wildlife conservation law, conservation of laws for air and water pollution.	1. Student learns about threat to bio diversity such as earthquake cyclone and landslides. 2. Students should understand the rules of environment protection along with this the student also understood the rules of wildlife conservation.

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Class: B.Sc- I, Paper-I **Chemistry**

Physical Chemistry

Unit s	Course content	Course/ Learning Outcomes: After completion of course, the students will be ableto-
Unit I (A) (B)	A. Mathematica l concepts B. Gaseous State and Molecular Velocities:	➢ Use the Knowledge of logarithm, differentiation and integration ➢ For understanding derivations in different chapters. ➢ Understand relationship between kinetic energy and temperature of a gas. ➢ Calculate the partial pressure, and use of kinetic theory of gases to understand the nature of gases.
Unit II (A and B)	A. Liquid State B. Solid State:	➢ Differentiate among solid, liquid and gases through different models and objects. ➢ Students will also be able to learn the nature of intermolecular forces and dependent properties like viscosity, surface tension and capillary action and their practical applications. ➢ This study will help the students during post-graduation and also for industrialapplication.
Unit III	Chemical Kinetics	➢ Understand that how to determine reaction rate and factors affecting the rate of reaction. ➢ Calculaterateconstantandorderofreactionf or differentkind of reactions. ➢ The students will be able to apply the concepts to solve the numerical problems during post graduation andcompetitive examinations.
Unit IV	Radioactivity and Nuclear Chemistry	➢ Learn the different kinds of nuclear reactions and their Mechanism. ➢ Learnthemechanismofradioactivityandits measurement. Basicunderstandingofchemical consequences ofinteraction of radiation with nucleus. ➢ Learnthe applications of nuclear chemistryin theoretical and nuclear powerplant. ➢ Apply the concepts encountered in the text or unit in post-graduation level.

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Class: B.Sc- I, **Paper-II** **Chemistry**

Inorganic Chemistry

Units	Course content	Course/ Learning Outcomes: After completion of course the students will be ableto-
Unit I	1. Atomic Structure 2. Periodi Properties:	➢ Understand the meaning offourquantum numbers and differentatomic theories, concept of nuclear charge, ionizatior energy, electron affinity and different parameters. ➢ They will be able to apply the quantum mechanics for the energy calculation of different energystates of an atom in post graduation studies and other competitive examination.
Unit II	Chemical Bonding- Part I:	➢ Understand the structure of a chemical substance in terms o bonds. ➢ Apply VSEPR theory to determine the geometry o amolecule. ➢ Imagine the molecule in three dimension structure and wil be able to utilize this knowledge at their post graduation leve and also for competitiveexamination.
Unit III	Chemical Bonding- Part II:	➢ Differentiate bonding amongst ionic and covalent compounds ➢ Understand that how lattice energy is correlated with physica properties of ionic compounds like solubility. The students wil be able to utilize the knowledge of semiconductorsatindustrial level.
Unit IV	A) S-Block Elements B) p-Block Elements Part- 1	➢ Understand the general trends of s block and p block elements inperiodictableandstudydifferentcompounds ofsblockandp block elements. ➢ Know the significance of alkali and alkaline earth metals in biological system. ➢ Utilize the knowledge of compounds of metals, nonmetals like boron, carbon, aluminum and different alloysatindustriallevel.
Unit V	P-Block Elements Part- 2	➢ Understand the structure and synthesis of boranes and silicates and their application at industrial and research level.

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Class: B.Sc.- I, **Paper-III** **Chemistry**

Organic Chemistry

Units	Course content	**Course/ Learning Outcomes:** After completion of course the students will be ableto-
Unit I	Structure and Bonding:	➢ Recognize the difference between aliphatic and aromatic compounds. ➢ Correlate the stability of organic molecules with aromaticity. ➢ Gain the knowledge of different kinds of reaction mechanism. On the basis of knowledge of intermediate formation and mechanism of reaction students will be able to predict the final product during post-graduation and higher studies.
Unit II	Alkanes and Cycloalkanes:	➢ Different reactions of alkanes and cycloalkanes. ➢ Different kinds of strain through conformationa studies of cycloalkane and stability of differen conformers. ➢ This study will help the students during pos graduation and competitive examinations.
Unit III	Alkenes Cycloalke nes Dienes	➢ Understand the different kinds of reactions of alkenes and cycloalkenes. ➢ Apply these methods in multistep synthesis of useful compounds at industrial and research level.
Unit IV	Alkynes an d Alkyl Halides	➢ Learn the skill of writing mechanism of reaction through different reactions ofalkyl halides. ➢ Able to understand different synthetic methods and reaction and will be able to apply these methods in multistep synthesis of useful compounds at research and industrial level.
Unit V	Stereochemistry of Organic Compounds	➢ Predict whether an organic compound is chiral or achiral. ➢ Recognize different elements of symmetry in chiral Compound. ➢ Recognizing and assigning stereochemica designations of organic compounds, which wil help in next level of graduation (stereochemistry o amines, stereochemistry of carbohydrates) and also during post-graduation.

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Class: B.Sc- II, **Paper-I** **Chemistry**

Physical Chemistry

Units	Course content	**Course/Learning Outcomes:** After completion of coursethe students will be ableto-
Unit I	A. Thermodynamics. B. Thermochemistr y	➢ Understand the different thermodynamic properties. ➢ Applythelawofthermodynamicstotherealsystem s. Understand different thermodynamic cycles.
Unit II	A Phase Equilibrium) Solid Solution B) Liquid-Liquid C) Mixture Partial Miscible D Liquids	➢ Understand different terminologies of phase equilibrium. ➢ Apply the concepts of text lecture in practical and post graduation level
Unit III	Electrochemistry- I	➢ Understand different types of conductance. ➢ Construct an electrochemical cell. ➢ Calculate EMF of a cell through standard reduction ➢ Potential data. ➢ Understand different electrode reactions. Apply these concepts to study the next unit.
Unit IV	Electrochemistry-II	➢ Understand the redox reaction occurring at electrode. ➢ Know the different kinds of electrodes and use of ➢ Electrodes in different electrochemical equipments. ➢ Understand the mechanism of buffer action.
Unit V	A Surface Chemistry B) Catalysis	➢ Differentiatethe mechanism of adsorption and absorption. ➢ Understand different methods of determination of surface area and able to utilize it during research. ➢ Learn phenomenon of catalysis and application.

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Class: B.Sc- II, Paper-II **Chemistry**

Inorganic Chemistry

Units	Course content	**Course/Learning Outcomes:** After completion of course, the students will be ableto-
Unit I	Chemistry of ElementsofFirst Transition Series.	➢ Different periodic properties of d-block elements of first transition series. ➢ Learn the chemistry of binary compounds. ➢ Understand the chemistry of these metal ions for the syntheses of different metal complexes in next units.
Unit II	Chemistry of Elements of Second and Third Transition Series	➢ Compare the trends between 3d, 4d and 5d series like stability of complexes in high and low oxidation states, magnetic, spectral and other properties. ➢ Understand the role of transition metals in electronic, biomedical, analytical, and catalytic and various applications. ➢ They will able to utilize this knowledge in research as well as industrial area.
Unit III	1. Coordinatio n Compounds . 2. Oxidation and Reduction	➢ Understand the basic concepts of coordination chemistry and role of d-electrons and d- orbitals in bonding. ➢ Differentiate among different theories of bonding. ➢ Apply the concepts encountered in this unit to the next level of graduation (Metal-ligand bonding). ➢ They will learn different techniques of extraction which will be useful for miningprocesses.
Unit IV	General Chemistry of f-Block Elements	➢ Understand the spectral magnetic and general properties as well as the role of actinides as nuclear fuel, in laser techniques, in batteries and for other purposes. ➢ Utilize this knowledge during post-graduation level and also for research and industrialarea.
Unit V	1. Acids an d bases. 2. Nonaqueou s Solvent	➢ Understand the different theories of acids and bases. ➢ Learn about different non aqueous solvents and able to use their knowledge in analytical chemistry.

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Class: B.Sc.- II, Paper-III **Chemistry**

Organic Chemistry

Units	Course content	Course/ Learning Outcomes: After completion of course the students will be ableto-
Unit I	Electromagnetic Spectrum: Absorpti o n Spectru m	➢ Compare all the electromagnetic radiations in terms of energy and wavelength. ➢ Understand the handling of UV and IR instruments. ➢ Understand that, why some compounds are colored and some are colorless. ➢ Interpret UV and IRspectra. ➢ Develop problem solving skills and able to use it at next level of spectroscopy.
Unit II	A)Alcohols B)Phenols	➢ Know the different methods for the syntheses of alcohols and phenols which they can use in multistep synthesis at industrial level. ➢ Learn the orientation effect on phenol. This study will help the students during post graduation and competitive examinations. ➢ Use different reactions for further research.
Unit III	Aldehydes an d Ketones	➢ Learn the IUPAC naming of aldehydes and ketones. ➢ Compare the reactivity of different aliphatic and aromatic aldehydes and ketones. ➢ Writethemechanismofdifferentcondensationreaction s. ➢ Develop the skills of synthesizing new condensation compounds for research purpose as well as for other applications at industriallevel.
Unit IV	1. Carboxylic Acids. 2. Eth e r	➢ Compare the reactivity of different aliphatic and aromatic carboxylic acids. ➢ Learn the handling of carboxylic acids in practica laboratory by knowing their physical and chemica properties ➢ Learn different reactions for synthesis of acid and acid derivatives. ➢ Utilize this knowledge during further higher studies and also during research

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Class: B.Sc.- III, Paper-II **Chemistry**

Inorganic Chemistry

Units	Course content	**Course/ Learning Outcomes:** After completion of course the students will be ableto-
Unit I	1. Hard and Soft Acids and Bases. 2. Silicones and Phosphazene s	➢ Understand the trends of acidity and basicity in periodic table. ➢ Learn the stability of salts through HSAB theories. ➢ Learn the syntheses and reactions of silicones and Phosphazenes. ➢ Understand the applicability of these silicones and Phospahzenes.
Unit II	1. Metal Ligan d Bonding 2. Thermodynamic s and kinetics	➢ Understand the bonding in metal complexes. ➢ Understand the difference between VBT and CFT. ➢ Learn that how geometries affect splitting and stability of d-orbital's. ➢ Understand the structure, color, magnetism and different behavior of complexes through CFT model. ➢ Knowtheroleofcomplexesinbiomedicine, environmental cleaning and drug delivery system.

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Unit III	Magnetic properties of Transition Metal Complexes	➢ Understandtherelation betweenthe electronic arrangement and magnetic behavior of complexes. ➢ Learn about the magnetic moment and their determination through different methods. ➢ Calculate the ground state term symbol for different d electronic systems.
Unit IV	ElectronicSpectra of Transition metal complexes	➢ Understand the spectroscopic notations. ➢ Abletorelatetheelectronicconfigurationof metalionwith spectral properties ofcomplex.
		➢ Understand the role of ligands in appearance of color of complex. ➢ Predict simple electronic spectrum of metal complex through Orgel diagram. ➢ Develop the skills for synthesis and characterize a coordination complex during research for desired application.
Unit V	Bioinorganic Chemistry	➢ Understandthe roleofelements in biological system. ➢ Learn the mechanism of functioning of these metal coordinated biomolecules. Know the application of these metal coordinated biomolecules in electron transfer mechanism, toxicology, as diagnostic agent and many more.

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Class: B.Sc.- III, Paper-III **Chemistry**

Organic Chemistry

Units	Course content	Course/ Learning Outcomes: After completion of course the students will be ableto-
Unit I	Nuclear Magneti c Resonance Spectroscopy	➢ Understand the basic principle of NMR spectroscopy. ➢ Able to interpret the simple NMR spectrum of organic compounds. ➢ Able to use the concepts of shielding, deshielding and coupling constantto elucidatethe structureof given organic compound. ➢ Apply the knowledge of spectroscopy during post graduation and higherstudies.
Unit II	1. Organo metallic Compounds. 2. Organo sulphur Compounds	➢ Know the different methods for the syntheses of Grignard reagent, organo lithium, organo sulphur and organo zinc compounds. ➢ Know the uses and applications of these compounds in variouschemicalreactions at industrial as well as research level. ➢ Learn the different kinds of polymers, their synthesis and uses at industrial level for various applications.
Unit III	Carbohydrates	➢ Able to classify different carbohydrates. ➢ Understandtherole of carbohydratesformaintaining human health. ➢ Learn the structure, functions, different reactions and stereochemistry ofcarbohydrates. ➢ Understandthemechanismofcleansingactionofsoapa nd detergents and able to apply the knowledge of this mechanism at industriallevel.
Unit IV	Amino Acids, Peptides, Proteins	➢ Understandtheessentialandnonessentialaminoacids. ➢ Understand the stereochemistry of amino acids.

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Class: -B.Sc. Ist year paper – I **Botany**

Unit	Course Content	Learning Outcome: - AfterCompletion of Course student will able to-
I	**VIRUSES AND PROKARYOTES:** - Viroids and prion. Characteristics of viruses, general account of mycoplasma crop diseases, reproduction and economic importance, bacterial structure, cyanobacteria and actinomycetes.	1. Define microbe. 2. Identify major types of microbes. 3. Describes how microbes are harmful and useful. 4. They made people aware for the preventation of diseases spreading in his area like malaria and dengue.
II	**ALGAE–** General characters, classification and economic importance, features and life history of Chlorophyceae – volvox. Charophyceae- Chara.	1. This course will help the student to understand the diversity of plants and evolutionary process in plant kingdoms. 2. Students were able to understand the different types of algae and their economic importance in a better way.
III	**FUNGI-** General characters, classification and economic importance, features and life history of oomycetes – albugo zygomycetes- mucor, Basidiomycetes- puccinia.	1. Students know about fungi structure nutrition and its method of reproduction. 2. Identify various types of fungus.
IV	**BRYOPHYTA–** General characters and classification, study of morphology anatomy and reproduction of hepaticoside- riccia	1. Students get to know the evolution and classification of bryophytes. 2. Students understand the external and internal structure of bryophytes.
V	**PTERIDOPHYTA–** General characters and classification, organization. Morphology and anatomy of rhynia, structure, anatomy and reproduction	1. Students understand the stellar organization of pteridophyta. 2. Students learn about the structure of strobilus.

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Class: - B.Sc. I[st] year paper –II **Botany**

Unit	Course Content	Learning Outcome: - AfterCompletion of Course student will able to-
I	**GYMNOSPERM –** Heterospory and origin of seed habit, gymnosperms, geological time scale and fossilization, types of fossils, tools and techniques.	1. Distinguish between the two types of seed plants – gymnosperm and angiosperm. 2. They learned about fossil gymnosperm and process of fossilization.
II	**GYMNOSPERM –** General account of cycadodiofilicales, bennettitals and gnetales,morphology,anatom y, reproduction and life cycle of Cycas.	1. Students understand the different between Cycas, Pinus and ephedra. 2. Students come to know about the economic importance of gymnosperm.
III	**TISSUE SYSTEM –** Types of vascular bundles, apicalmeristem, the root system, secondary growth in root, anatomy of monocot and dicot root, root apical meristem.	1. Students get to know about the basic tissue system of plants. 2. Students know the anatomical structure of stems. 3. Students describe the different between anatomy of monocot and dicot stem. 4. Understand the structure and function of xylem and phloem.
IV	**THE SHOOT SYSTEM-** Characteristic of growth rings, sap wooda heart wood, secondary phloem, cork cambium and periderm, anatomy of c3 and c4 plants.	1. Students under stood about the theories of shoot system. 2. Understand the structure and function of xylem and phloem.
V	**THE LEAF SYSTEM-** Origin and development of leaf, diversity in size, shape and arrangement, adaptation to photosynthesis and water stress, senescence and abscission.	1. Students learn the different types of modification of leaves. 2. They know about function of leaves like photosynthesis, senescence and abscission.

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Class: - B.Sc. IInd year **Paper – I** **Botany**

Unit	Course Content	Learning Outcome: - AfterCompletion of Course student will able to-
I	**TAXONOMY-** Origin and evolution of angiosperm, Principles and rules of botanical nomenclature, herbarium technique, system of classification, modern trends of taxonomy	1. Students know about origin and evolutionof angiosperm. 2. Students taught to make herbarium. 3. They learnt about modern trends of taxonomy. 4. The students made a list of different plant species of college campus and studied them.
II	**TAXONOMY-** Terminology for botanical description i n semitechnical language, dicotyledonous families: Polypetaleae	1. Students taught terminology for botanical description in semi technical language. 2. Students learn to describe dicot families like Malvaceae and Fabaceae
III	**TAXONOMY-** Monocotyledonous families	1. All the students learned and understood about the taxonomic description and economic importance of different dicot plants in family level.
IV	**EMBRYOLOGY-** Structure of anther, interaction and self- incompatibility, structure of pistil , microsporogenesis, and male gametophyt e, concept of flower as a modified.	1. Describe the parts of the plant. 2. Identify the reproductive structures of plants that exist in the flower. 3. Explain the difference between pollination and fertilization.
V	**EMBRYOLOGY-** Double fertilization and triple fusion, development of embryo in monocot and dicot plants. Fruit development an d maturation seed	1. Define the term-fertilization. 2. Explain dicot and monocot embryo. 3. Students learned about the formation of fruit, structure of seed and vegetative propagation. 4. Students propagated some plants in the garden of their house using the vegetative propagation method.

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Class: -B.Sc. II[nd] year **paper-II** **Botany**

Unit	Course Content	Learning Outcome: - AfterCompletion of Course student will able to-
I	**ECOSYSTEM–** Biotic and abiotic components, trophiclevels, food chain, food web, energyflow, concept of biogeochemical cycles, gaseous liquid and sedimentary cycles,	1. Student understood about structure and function of ecosystem. 2. Student learns how food chains; food webs and biogeochemical cycles operate in a heathy ecosystem.
II	**ECOLOGICAL ADAPTATION-** Morphological, anatomical and physiologica l responses water adaptation, light adaptation, photoperiodism, plan t succession,	1. Students understood about the ecological adaptation of hydrophytes and xerophytes. 2. Students understand key term of ecological succession. 3. The students understood the process ofanecological succession well.
III	**BIODIVERSITY AND POPULATION ECOLOGY** –Distribution pattern density, natality mortality, growthcurves, ecotypes and ecads, biodiversity: basicconcept. Importance, biodiversity of India. Biosphere reserve.	1. The students taught the frequency, density and abundance of an area to come out with the quadrat method. 2. Students understood the importance of biodiversity conservation. 3. Students got in formation about endangered plant and animal species from all over the world. 4. Students made a list of endangered species of own area.
IV	**SOIL AND POLLUTION-** Physical and chemical properties, formation, development of soil profile, soil classification, soil factors, climate change and ozone layer & ozone hole.	1. The students understood about the physical and chemical properties of soil. 2. Student collected different soil samples of his area and learned about their composition. 3. Students understood the problems of environmental pollution of his area.

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Class: - B.Sc. III[rd] year **Paper-I** **Botany**

Unit	Course Content	Learning Outcome: - AfterCompletion of Course student will able to-
I	**PLANT AND WATER RELATION–** Properties of water, importance of water in plant life, waterabsorption, mechanism of transpiration, osmosis& osmotic relation to plan cell	1. Students understood osmosis by doing practical. 2. Students understood the process the transpiration.
II	**PLANT NUTRITION AND BIOMOLECULES –** Mineral nutrition, absorption of mineral, translocation of organic solutes, proteins and lipid.	1. All the students learned that how plants absorb mineral from their roots. 2. After study all the students went to the field of their area to know about the mineral deficiency of plants.
III	**PHOTOSYNTHESIS–** Chloroplast,photosynthetic pigment, light reaction, red drop, hatch & slack cycle Calvincycle,	1. Students understand the structure of chloroplast. 2. Students understand the process of photorespiration.
IV	**RESPIRATION-** Mitochondria, glycolysis,crab's cycle, pentose phosphate pathway, electron transport system,	1. Students understands structures and function of mitochondria. 2. Students learned to draw RQ. 3. Students understood the mechanism of respiration
V	**ENZYMOLOGY AND PLANT HORMONES -** Coenzyme and co factors, classification,characteristics ofenzyme, factor affecting enzyme activity, cytokinin	1. They understood the mechanism of enzyme action. 2. They understood the mode of action and role of plant hormones.

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Class: - B.Sc. III[rd] year **paper II** **Botany**

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	**THE CELL ENVELOPS AND ORGANELLES –** Plasma membrane, lipid bilayer structure,mitochondria,Golg i bodies, peroxisome and vacuole, nucleus, chloroplast	1. Students learns about different plant cell organelles and understand their structure and function. 2. Students understood how plasma membrane is selectively permeable.
II	**CHROMOSOMAL ORGANIZATION-** Mitosis and meiosis, nucleosome model, DNA structure and replication, types of chromosomes,	1. Understand the basic structure and function of DNA & replication. 2. The students understood the structure function and variation of chromosomes, they learned about the special type of chromosome. 3. They understood about mitosis and meiosis and learn the significance.
III	**GENETIC INHERITANCE** –DNA damage and repair, interactions of genes cytoplasmic inheritance	1. They know how do gone influence trail. 2. Studentsunderstood Mendel'swork and learned the rules made by him. 3. They learned about mutation.
IV	**GENE –** Structure of gene, geneticcode, transfer of genetic informatio n, proteinsynthetic, tRNA and ribosomes,	1. They learned about the structure of genes. 2. Well, the genetic code protein synthesis and regulation of gene expression.
V Part- 1	**BIOTECHNOLOGY–** Cellular totipotency,differentiation andmorphogenesis, achievement of biotechnology in agriculture.	1. Students understood how plant tissue culture is done. 2. They learnt about important achievements of biotechnology in agriculture.
V Part- 2	**GENETIC ENGINEERING-** Gene mapping and chromosome walking, cloningvectors, genomic and cDNA library.	1. They learnt about tools and techniques of recombinant DNA technology, cloning vectors and DNA library.

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Program Specific Outcome (PSO's)

Zoology

Class: B. Sc. 3rd year paper -1 **Zoology**

Unit	Course/Content	Learning Outcome: - After attend the class student able to learn.
1st	Heredity and Genetic material 1. Mendel's Laws of inheritance 2. Variations: sources and types 3. Structure, molecular organization and function of DNA and RNA and types of RNA 4. DNA replication on Prokaryotes 5. Nucleosome(Solenoid model)	Students get an idea about the principles of Mandal they learn the structure of DNA RNA and get knowledge about DNA replication.
2nd	Gene Expression 1. Genetic Code 2. Transcription in Prokaryotes 3. Translation on Prokaryotes 4. Gene expression: Regulation of protein synthesis and Lac Operon model. 5. Split gene, Overlapping gene, pseudo-gene	Students will be able to get idea about Protein synthesis they learn about different type of genes, like split gene overlapping gene and pseudo gene.
3rd	Linkage and Chromosomal aberration 1. Linkage and crossing over: Types and significance 2. Sex determination: Chromosomal and genetic balance theory 3. Sex linked inheritance(Haemophilia, Colour Blindness) 4. Structural and numericalchanges in chromosomes 5. Mutation: Types and Mutagens	Students gets knowledge about sex determination they will be able to know the inheritance of haemophilia colour blindness they also get knowledge about aneuploidy and polyploidy.
4th	Human Genetics 1. Human Karyotype 2. Human Genome Project 3. Multiple allete and inheritance of blood group 4. Autosomaland Sex Chromosome Syndromes in Human 5. Genetic diseases in Human: Sickle cell anaemia, Albinism and Thalassemia.	Student will be able to understand the inheritance of blood group they know about the genetic disease like Sickle Cell anaemia albinism and Thalassemia.

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5th	Genetic Engineering 1. Recombinant DNA technology and Gene Cloning 2. Polymerase chain reaction 3. Blotting- Southern, Northern and Western 4. DNA finger printing 5. Gene therapy and Genetic Counselling.	Students learn about the DNA fingerprint printing Technology and know how it is helpful in detecting the criminals digit knowledge about PCR technology and idea about gene therapy.

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Class: B. Sc. 2nd year **paper-2** **Zoology**

Unit	Course/Content	Learning Outcome: - After attend the class student able to learn.
1st	Nutrition and Metabolism 1. Physiology of digestion on Mammals. 2. Protein Metabolism: Deamination, Decarboxylation, Transamination of amino acids and Ornithine cycle. 3. Carbohydrate metabolism: Glycogenesis, Gluconeogenesis, Glycogenolysis, Glycolysis and Citric acid cycle 4. Lipid Metabolism-Beta oxidation of fatty acids	Students will have a good understanding of physiological process like digestion formation of Urea metabolism of glucose.
2nd	Respiration, Excretion and Immune System 1. Mechanism and Physiology of respiration in mammals (transport of gases, chloride shift) 2. Physiology of Excretion- urea and urine formation in mammals 3. Osmoregulation and excretory product 4. Innate and acquired immunity, immune cells and lymphoid system, immune response: cellular and humoral immunity.	Students gets the complete knowledge about physiology of respiration and excretion they know about the immune system system and its functioning.
3rd	Regulatory Mechanism of Enzymes and role of Vitamins 1. Thermoregulation 2. Definition, nomenclature and classification of enzymes 3. Mechanism and regulation of enzymes action 4. Co-enzymes 5. Vitamins	They know about the enzyme classification working of enzyme and coenzyme knowledge about vitamins their sources and functions.
4th	Neuromuscular Co-ordination 1. Types of neurons 2. Physiology of nerve impulse conduction 3. Types and structure of Muscles 4. Theory of muscle coordination and its biochemistry.	Students will be able to understand the types of neurones and muscles and know the physiology of nerve impulse conduction and muscle contraction.

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5th	Endocrine system 1. Structure and functions of Pituitary gland 2. Structure and functions of Thyroid gland 3. Structure and functions of Adrenal gland 4. Structure and functions of Parathyroid, Thymus and Islets of Langerhan's 5. Physiology of Male and female Sex hormones.	Students will be get knowledge about structure of endocrine glands hormone secreted by them and their function.

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Class: B. Sc. 2nd year **paper-1** **Zoology**

Unit	Course/Content	Learning Outcome: - After attend the class student able to learn.
1st	1. Origin of Chordates, Classification of phylum Chordata up to orders according to Parker and Haswell (Latest Edition) 2. Urochordata: Type study of Herdmania 3. Cephalochordata: Type study of Amphioxus, Affinities of Amphioxus 4. Comparison between Petromyzon and Myxine	Students known about the origin of chordates classification of chordates anatomy of hardmania differences betwee n petromizon and myxine.
2nd	1. Comparative account of integuments and its derivatives of Vertebrates. 2. Comparative account of limbs and girdles of Vertebrates 3. Comparative account of digestive system of Vertebrates 4. Comparative account o f respiratory system of Vertebrates	Learn similarity and dissimilarity abou t intaguments Limbs,Girdel, digestive and respiratory system of vertebrates.
3rd	1. Comparative account of aortic arches and heart of Verebrates 2. Comparative account of brain of Vertebrates 3. Comparative account o f urogenital system of Vertebrates 4. Sense organs (eye and ear) of mammals 5. Placentation in mammals	Know the comparative account of heart brain and urinogenital system of vertebrates. they know the complete anatomy of ear and eye.
4th	1. Origin of life: Modern concepts only. 2. Lamarckism, Darwinsim, de Vries. 3. Modern synthetic theories of evolution 4. Adaptation and Mimicry 5. Micro, macro and mega evolution	Students get knowledge about origin of life various theories about evolution and adaptations.
5th	1. Fossils, methods o f fossilization, determination of age of fossils 2. Study of extinct forms: Dinosaurs and Archaeopteryx 3. Zoogeographical distribution 4. Evolution of man 5. Geological time scale and Insular fauna .	Students get the complete knowledge about fossils .learn about extinct animal like Dinosaurs and archaeopteryx , also get idea about evolution of man.

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Class: B. Sc. 3rd year **paper-2** **Zoology**

Unit	Course/Content	Learning Outcome: - After attend the class student able to learn.
1st	Concept of Ecology 1. Abiotic and Biotic Factors, Component of ecosystem 2. Energy flow in ecosystem: Food chain, Food web and Pyramids 3. Biogeochemical cycle: Carbon, Oxygen, Nitrogen, Phosphors 4. Population Concept- Characteristics of population, Factors affecting Population Growth 5. Community: characteristics of community	Students learn about the concept of ecosystem , abiotic and biotic factors of different ecosystem and get idea about food chain and food web and different biochemical cycles.
2nd	Habitat Ecology 1. Fresh water habitat 2. Marine habitat 3. Terrestrial habitat 4. Ecological division of India 5. Biodiversity: Natural resources and their conservation with special reference to forests.	Students will understand the different habitat as fresh freshwater marine and terrestrial and as how they relate with conservation of Aquatic and Terrestrial flora and fauna. They also get knowledge about the ecological division of India.
3rd	Wild Life and Environment 1. Wild life protection Act, National Parks and Sanctuaries of Madhya Pradesh 2. Endangered species of India 3. Types of pollution: Air, Water, soil, thermal and noise pollution 4. Urbanisation and effect of human population on environment	Students will be able to apply knowledge to solve problems related to wildlife conservation and management they also know about the causes and control of different type of pollution
4th	Aquaculture 1. Prawn culture: Culture of Fresh water, methods of prawn fishing, preservation and processing of prawns 2. Pearl culture and pearl industry 3. Frog culture 4. Major carp culture: Management of Ponds, preservation and processing of fishes. 5. Maintenance of Aquarium	Student will be able to understand the prawn culture and frog culture they learn how to culture the different species their management and harvesting they also get knowledge about aquarium management Frog, prawn, and fish.
5th	Economic Entomology 1. Sericulture: Species of silkworm, life history of Bombyx mori, sericulture Industry in India 2. Apiculture: Life cycle of Honey Bee, methods of bee keeping, products of bees, enemies of bees. 3. Lac culture: Life cycle of lac insect and host plant of lac insects. 4. Common pests: Stored grains: Sitophilus oryzae and Tribolium castanaeum, Vegetable pests: Piers brassicae and Dacus cucurbitae 5. Biological control of insects pests.	Student know about the life cycle of useful insects like silkworm honeybee and lac insect they also know about the life cycle of harmful pest and apply it to management of insect pest.

Program Specific Outcome (PSO's)

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Mathematics

Students will be able to identify, analyze and solve the problems.

- Students can get the jobs in school education, Banking sector, Insurance sector, Data operator, Railways staff selection, RRB, Defence services, Post office services.
- They can persue Higher Education (M.Sc. Mathematics).
- Students will be able to interpret Data and they understand the wider use of mathematics to solve the pendamic situation like COVID-19.

B.Sc. – I Year Paper-II **Mathematics**

CALCULUS AND DIFFERENTIAL EQUATIONS

UNITS	COURSE CONTENTS	COURSE LEARNING OUTCOMES
UNIT-I	Successive differentiation, Leibnitz's theorem Maclaurin's and Taylor's series expansions, Asymptotes.	Students able to find ✓ Get an idea of Find the Maclaurin's and Taylor series expansions of given functions and notion of successive differentiation. ✓ Get an idea of Taylor's series can be used to solve ordinary differential equations, to find the sum of series, evaluation of limits. Most important application of Taylor's series is to use partial sums to approximate functions. ✓ Leibnitz's theorem is used to find the value of n^{th} derivative at zero of function which can be express as a product of two functions.
UNIT-II	Curvature, tests for concavity and convexity, points of inflection, multiple points, tracing of curves in Cartesian and polar coordinates.	Students able to find out ✓ Get an idea of concept of curvature & calculate curvature of curve in Cartesian or polar form and Draw the graph of some curves using curve tracing. ✓ Curvature is used in differential geometry & in a three part equation for bending of beams. It is also applied to measurements of the stress in the semiconductor structures.
UNIT-III	Integrations of transcendental functions. Definite integrals, Reduction formulae, Quadrature Rectification.	Students able to find ✓ Get an idea of about transcendental functions & how to integrate them. ✓ Integration by reduction formula always helps to solve complex integration problems.
UNIT-IV	Linear differential equations and equations reducible to the linear form. Exact differential equations. First order and higher degree equations solvable for x, y and p. Claraiut's equation and singular solutions. Geometrical meaning of a differential equation. Orthogonal trajectories.	Students able to find ✓ Get an idea of various techniques of getting exact solutions of first order linear differential equations and linear differential equations of higher degree. ✓ Applications in fluid dynamics- Design of containers and funnels. ✓ Applications in heat conduction analysis - Design of heat spreaders in microelectronics.
UNIT-	Linear differential equation with constant coefficients.	Students able to find

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V	Homogeneous linear ordinary differential equations. Linear differential equations of second	✓ Students able to transform equation by changing the dependent variable independent variable. ✓ Get an idea of find solution by the method of variation of parameters.

B.Sc. – I Year Paper-II Paper-III Mathematics

Vector Analysis and Geometry

UNITS	COURSE CONTENTS	COURSE LEARNING OUTCOMES
UNIT-I	Scalar and vector product of three vectors, products of four vectors. Reciprocal vectors, vector differentiation, Gradient , Divergence and Curl	Students able to find ✓ Get an idea of gradient (Normal to the surface) of scalar function. It is used to compute directional derivative and Calculate the scalar & vector product of three and four vectors. ✓ Find divergence and curl of vector field and prove identities involving them.
UNIT-II	Vector Integration. Theorems of Gauss, Green, stoke's(without proof) and problem based on them.	Students able to find ✓ Get an idea of Interpret line, surface and volume integrals. ✓ Get an idea of using line integral we will compute work done by a particle in moving along curve. ✓ Evaluate integrals by using Green's Theorem, Stokes theorem, Gauss's Theorem. Gauss theorem is applying to calculate volume. ✓ These theorems relate vector fields and integrals - Green's theorem for vectors in two dimensions, and the other theorems for vector fields in three dimensions.
UNIT-III	General equation of second degree, tracing of conics, system of conics, polar equation of conic.	Students able to find ✓ Get an idea of trace conics. ✓ Graph the polar equations of conics.
UNIT-IV	Equation of cone with given base, generators of cone, condition for three mutually perpendiculars generators, right circular cone, equation of cylinder and its properties.	Students able to find ✓ How to find equation of cone with given base? ✓ Get an idea of the equation of Right circular cone. ✓ Get an idea of Cylinder and its properties.
UNIT-V	Central coincoids, Paraboloids, plane sections of concoids, generating lines.	Students able to find ✓ Students know about central conicoids, parabola, and plane section of coincoids. ✓ Understands the concept of generating lines.

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B.Sc. – II Year Paper-II P a p e r -I **Mathematics**

Abstract Algebra

UNITS	COURSE CONTENTS	COURSE LEARNING OUTCOMES
UNIT-I	Definition and basic properties of groups, subgroup, subgroup generated by subset, Cyclic groups and simple properties.	Students will be able to: ✓ Get an idea of Group & its properties. ✓ Get an idea of Subgroups, Cyclic groups and simple properties.
UNIT-II	Coset decomposition, Lagrange's theorem and its corollaries including Fermat's theorem, Normal subgroups, and Quotient groups.	Students will be able to: ✓ Get an idea of Use Lagrange's theorem ✓ Explain the significance of the notions of cossets, normal subgroups, and Quotient groups. ✓ Recall and use of definition & properties of cosets and subgroups.
UNIT-III	Homomorphism and Isomorphism of groups, fundamental theorem of homomorphism. Transformation and permutation group Sn (various subgroups of Sn, n<5 to be studied), Cayley's theorem.	Students will be able to: ✓ Understands the concepts of Homomorphism and isomorphism of groups. ✓ Get an idea of Permutation group and its subgroups. ✓ Understands Cayley's theorem and its applications.
UNIT-IV	Group Automorphism, inner Automorphism, group of Automorphisms, Conjugacy relation and centraliser. Normaliser, Counting Principle, class equation of a finite group, Cauchy's theorem for finite abelian groups and non-abelian groups.	Students will be able to: ✓ Get an idea of group Automorphism, inner Automorphism ✓ How to define Conjugacy relation and centraliser. ✓ Define Normaliser, Counting Principle ✓ Understands Cauchy's theorem for finite abelian & non abelian groups.
UNIT-V	Definition and basic properties of Rings. Ring homomorphism, subrings, Ideals and Quotient rings, Polynomial rings & its properties, Integral domain and field.	Students will be able to: ✓ Get an idea of Ring, subring & Ring homomorphism ✓ Understands Integral domain and field.

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B.Sc. – II Year Paper-II P a p e r -II **Mathematics**

Advanced Calculus

UNITS	COURSE CONTENTS	COURSE LEARNING OUTCOMES
UNIT-I	Definition of a sequence, Theorems on limits of sequences, bounded and monotonic sequences, Cauchy's convergence criterion, series of non-negative terms, comparison test, Cauchy's Integral test, Cauchy's Root test, ratio tests, Raabe's tests, logarithmic tests, Alternating series, Leibnitz's test, Absolute and conditional convergence	Students will be able to: ✓ Get an idea of, Cauchy's convergence criterion. ✓ Understands the convergence of a series of real numbers by comparison test, Cauchy's Integral test, Cauchy's Root test, ratio tests, Raabe's tests, logarithmic tests. ✓ How to applied Leibnitz's test for alternating series? ✓ Get an idea of acquaint the student with mathematical tools available in Statistics needed in various field of science and engineering.
UNIT-II	Continuity of functions of single variable, sequential continuity. Properties of continuous functions. Uniform continuity, chain rule of differentiability, Mean value theorems and their geometrical Darboux's intermediate theorem for Derivatives	Students will be able to: ✓ Get an idea of properties of continuous functions. ✓ Understands sequential continuity, uniform continuity. ✓ Applying Chain rule of differentiability. ✓ Understand the consequences of various mean value theorems for differentiable functions.
UNIT-III	Limit and continuity of functions of two variables, Partial differentiation, Change of variable, Euler's theorem on homogeneous functions, Taylor's theorem for function of two variables, Jacobians.	Students will be able to: ✓ Get an idea of examine the continuity of a function at a point. ✓ Euler's theorem is very useful to proving complicated problem based on partial differentiation in simpler manner. ✓ How to apply Taylor's theorem? ✓ Definition of Jacobians and it can be used to check variable are independent or dependent.
UNIT-IV	Envelopes, Evolutes, maxima and minima of functions of two variables, Lagrange's multiplier method, Beta and Gamma functions	Students will be able to: ✓ Get an idea of How to find maxima and minima of functions of two variables. Finding maxima or minima also has important applications in linear algebra and game theory. ✓ Derive relation between Beta and Gamma functions. ✓ Evaluate integrals by using Beta and Gamma functions.
UNIT-V	Double and triple Integrals, volumes and surfaces of solid of revolution, Dirichlet's integrals, change of order of integration in double integrals	Students will be able to: ✓ Get an idea of Change of variables in integral. ✓ Apply double and triple integral to find Area, Volume, Total mass, Centre of gravity and Moment of inertia. ✓ Understand to the Change the order of integration in double integral. It's very useful to compute the value of some difficult integral in easier manner.

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B.Sc. – II- y e a r **Paper-II Mathematics**

Differential Equations

UNITS	COURSE CONTENTS	COURSE LEARNING OUTCOMES
UNIT-I	Series solution of differential equations, Power series method, Bessel and Legendre equations, Bessel and Legendre functions and their properties recurrence and generating function, Orthogonality of functions.	Students will be able to: ✓ Get an idea of ordinary and regular singular points. ✓ Bessel's and Legendre' functions generating function. ✓ Orthogonality of functions.
UNIT- II	Laplace transformation, Linearity of Laplace transformation, Existence theorem for Laplace transform, Laplace transforms of derivatives and integrals, shifting theorem s, differentiation and integration of transforms.	Students will be able to: ✓ Get an idea of Laplace transforms using various properties. ✓ Understands Existence theorem for Laplace transforms. ✓ Differentiation and integration of transforms. ✓ How to solve differential equations by using Laplace Transform. How to find transfer function of mechanical system, how to use Laplace Transform in nuclear physics as well as Automation engineering, Control engineering and Signal processing.
UNIT- III	Inverse Laplace transforms, convolution theore m, Application of Laplace transformation for solving initial value problems of second order linear differential equations with constant coefficients.	Students will be able to: ✓ Get an idea of inverse Laplace transform to solve differential equations. ✓ Students can find inverse Laplace transform using convolution theorem of function which can be expressed as a product of two functions. ✓ Inverse Laplace transformation and Fourier Transform which are used in various branches of engineering.
UNIT- IV	Partial differential equations of the first order, Lagrange's solution, some special types of equations which can be solved easily by methods other t h a n the general method, Charpit's general method.	Students will be able to: ✓ Get an idea of Find the solution of First order linear partial differential equations (Lagrange's PDE). ✓ Find the solution of First order nonlinear partial differential equations (Standard forms & Charpit's methods).
UNIT- V	Partial differential equation of second and higher orders, Classification of partial differential equations of second order, Homogeneous and non-homogeneous equations with constant coefficients, equation of vibrating string, heat equation Laplace's equation and them solutions.	Students will be able to: ✓ Get an idea of PDE. ✓ Solve Homogeneous and non- homogeneous equations with constant coefficients. ✓ Learn the use of the separation of variable technique to solve partial differential equations relating to heat conduction in solids and vibration of solids in multidimensional systems.

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B.Sc. – III Year **Paper-I**

Mathematics

Linear Algebra and Numerical Analysis

UNITS	COURSE CONTENTS	COURSE LEARNING OUTCOMES
UNIT-I	Definition and examples of Vector spaces, subspaces, sum and direct sum of subspaces, Linear span, Linear dependence, independence and their basic properties, Basis, Existence theorem for basis, Dimension, Finite dimensional vector spaces, existence of complementary subspaces of a subspaces of a finite dimensional vector space, Dimension of sum of subspaces, Quotient space and its dimension.	Students will be able to: ✓ Get an idea of sum & direct space of subspaces. ✓ How to check vectors are L.D.? Or L.I. ✓ Know about Basis, Existence theorem. ✓ Define FDVS, Quotient space and its dimension.
UNIT-II	Linear transformations and their representation as matrices, Algebra of linear transformations, Rank-Nullity theorem, change of basis, dual space, bi-dual space and natural isomorphism, adjoint of a linear transformation, Diagonalisation, Bilinear, Quadratic and hermitian forms.	Students will be able to: ✓ Get an idea of linear transformations and their representation as matrices. ✓ Applying Rank-Nullity theorem. ✓ How to use Diagonalisation. ✓ Bilinear, Quadratic and hermitian forms.
UNIT-III	Inner Product Space- Cauchy- Schwartz inequality, orthogonal vectors, orthogonal complements, orthogonal sets and bases, Bessel's inequality for finite dimensional spaces, Gram-Schmidt orthogonalization process.	Students will be able to: ✓ Get an idea of How to use Cauchy-Schwartz inequality ✓ Recall Orthogonal vectors, orthogona l complements, orthogonal sets and bases. ✓ Gram-Schmidt orthogonalization process.
UNIT-IV	Solution of Equations: Bisection, Secant, Regula-Falsi, Newton's Methods. Roots of second degree polynomial equations. Interpolation: Lagrange interpolation, divided differences, Interpolation formula using Differences. Numerical Quadrature. Newton's-Cote's formulae, Gauss Quadrature formulae.	Students will be able to: ✓ Get an idea of numerical methods. ✓ Understand the concepts of interpolation & how to use for equal & unequal intervals. ✓ How to apply Newton's-Cote, Gauss Quadrature formulae.

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UNIT-V	Linear equations direct methods for solving systems of linear equations (Gauss elimination, LU decomposition, Cholesky decomposition), Iterative methods (Jacobi, Gauss Seidal reduction methods.). Ordinary differential equations: Euler's method, single step method, Runge-Kutt's method, Multistep methods, Milne Simpson method. Methods based on Numerical integration, Methods based on numerical diff.	Students will be able to: ✓ Get an idea of solve systems of linear equations. ✓ Iterative methods to solve systems of linear equations. ✓ how to apply Numerical Method to solve ODE. ✓ Get an idea of Numerical Integration ✓ Understand Numerical Differentiation Understands the applications of numerical integration in

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B.Sc. – III Year **Paper-II** **Mathematics**

Real and Complex Analysis

UNITS	COURSE CONTENTS	COURSE LEARNING OUTCOMES
UNIT-I	Riemann integral, Integrability of continuous and monotonic functions. The fundamental theorem of integral calculus. Mean value theorems of integral calculus, Partial derivatives and differentiability of real-valued functions of two variables. Schwarz's and Young's theorem. Implicit function theorem.	Student must be able to ✓ Get an idea of Riemann integral. ✓ Get an idea of The fundamental theorem of integral calculus. ✓ Get an idea of Mean value theorems of integral calculus. ✓ Understands Schwarz's and Young's theorem. Implicit function theorem.
UNIT- II	Improper integrals and their convergence, Comparison tests, Abel's and Dirichlet's tests. Frullani's integral as a function of a parameter. Continuity, derivability and Integrability of an integral of a function of a parameter. Fourier series of half and full intervals.	Students will be able to: ✓ Get an idea of Improper integrals. ✓ Get an idea of Comparison tests, Abel's and Dirichlet's tests. ✓ Get an idea of Continuity, derivability and Integrability of an integral of a function of a parameter. ✓ Fourier series of half and full intervals.
UNIT-III	Definition and examples of metric spaces. Neighbourhoods. Limit points. Interior points. Open and closed sets. Closure and interior Boundary points. Subspace of metric space, Cauchy sequences, Completeness, Cantor's intersection theorem. Contraction principle, Real number as a complete ordered field. Dense subsets. Baire Category theorem. Separable, second countable and first countable spaces Continuous functions, Uniform continuity, Properties of continuous functions on Compact sets.	Students will be able to: ✓ Get an idea of metric space. ✓ Known about Limit points. Interior points. Open and closed sets. ✓ Define Cauchy's sequence and completeness. ✓ Cantor's intersection theorem and Baire Category theorem. ✓ Get an idea of Second countable and first countable spaces, Continuous functions, Uniform continuity. ✓ Properties of continuous functions on Compact sets.
UNIT-IV	Continuity and differentiability of complex functions. Analytic functions, Cauchy- Riemann equations, harmonic functions, Cauchy's Theorem, Cauchy's Integral formula.	Students will be able to: ✓ Get an idea of continuity and differentiability of complex functions. ✓ Evaluation of integrals using Cauchy's theorem & Cauchy's Integral formula.
UNIT- V	Power series representation of an analytical function, Taylor's series Laurent's series, Singularities, Cauchy's Residue Theorem, contours Integration.	Students will be able to: ✓ Get an idea of analytic functions as power series ✓ Know about Taylor's, Laurent's series. ✓ How to find singular point & Compute residue at which. ✓ Evaluation of contours Integration using Cauchy's Residue Theorem.

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B.Sc. – III Year Paper-III **Mathematics**

Graph Theory

UNITS	COURSE CONTENTS	COURSE LEARNING OUTCOMES
UNIT-I	Boolean Function, Disjunctive& cunjunctive normal form. Bools expansion theorem, Realation.	Students will be able to: ✓ Get an idea of Boolean Function. ✓ Get an idea of Disjunctive& cunjunctive normal form. ✓ Bools expansion theorem.
UNIT-II	Partial order Relations, Partial order sets, Hasse diagram, Maximal ana minimal Eliments, Lettice.	Students will be able to: ✓ Get an idea of Partial Order Relations. ✓ Known about Partial order sets. ✓ Define Hasse diagram. ✓ Maximal ana minimal Eliments. ✓ Properties of Lettice.
UNIT-III	Graph, Subgraph, connectad and disconnected graphs, Euler graph, path and circuit, weighted graph, algorithm for shortest paths.	Students will be able to: ✓ Graph, Subgraph, connectad and disconnected graphs. ✓ Euler graph, path and circuit. ✓ Define weighted graph, algorithm for shortest paths.
UNIT-IV	Trees and its properties, rooted tree, binary tree, rank and nullity of a graph, KRUSKAL and PRISM algorithm.	Students will be able to: ✓ Get an idea of Trees and its properties ✓ Know about rooted tree and binary tree. ✓ How to find rank and nullity of a graph? ✓ Evaluation of KRUSKAL and PRISM algorithm.
UNIT-V	Matrix Representation of graphs, Incidence and Adjacency matrix, Cuset and planar graphs.	Students will be able to: ✓ Get an idea of Matrix Representation of graphs. ✓ Known about Incidence and Adjacency matrix. ✓ Define Cuset and planar graphs.

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Program Specific Outcome (PSO's)

Physics

Class: - B.Sc. I year **I paper** **Physics**

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Mathematical physics	• Understand scalar and vector quantities. • Addition, subtraction and product of two vectors; • Triple and quadruple product (without geometrical applications); • Scalar and vector fields; • Differentiation of a vector; • Use of Gradient, Divergence and Curl; • Use of Laplacian operator; • Use of line, surface and volume integrals; • Use of Gauss', Stokes' and Green's Theorems.
II	Mechanics	• Understand Position, velocity and acceleration vectors, • Able to find out component of vector quntitity. • Newton's Laws of motion and its explanation with problems, • Various type of force in nature • Know about the gravitational field, and Potential. • Understand concept of System of particles, and C.M. • Solve the problem related to Elastic and inelastic collisions.
III	General Properties of Matter	• Understand Elastic moduli and their relations, • Able to determine rigidity of wire. • Know of concept of Surface Tension, Angle of Contact, • Determination of surface tension by various method; • Concept of Viscous Forces and Viscosity; • Define the flow of fluid.
IV	Oscillations	• Understand Concept of Simple, Periodic & Harmonic Oscillation with illustrations; • Solve problem of harmonic oscillator, • Find out Kinetic and potential energy of Harmonic Oscillator;
V	Relativistic Mechanics	• Understand the motion of objects in different frame of references. • Develop understanding of special theory of relativity and its applications to understand length contraction, time dilation, relativistic addition of velocities, conservation of momentum and variation of mass, relativistic momentum, relativistic energy, and massenergy relation.

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Class: - B.Sc. I year II paper

Physics

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Thermodynamics-I	• Understand concept of Heat energy. • Know about Reversible and irreversible process. • Understand concept of Heat engines, • Definition of efficiency, • Effective way to increase efficiency, Carnot's engines and refrigerator, • Its applications. Steam engine, Otto engine, Petrol engine, Diesel engine.
II	Thermodynamics-II	• Know Concept of entropy, and its Physical significance. • Make Relation between thermodynamic variables.
III	Statistical Physics-I	• Know about the different states of particle and probability of particles in that states. • Understand the concept of ensemble. It's type.
IV	Statistical Physics-II	• Understand Phase space, • The probability of a distribution, • Maxwell-Boltzmann statistics, • Constraints of accessible and inaccessible states. • Bose-Einstein statistics, • Black-body radiation. • Fermi-Dirac statistics. • Concept of Phase transitions.
V	Contribution Of Physicists	Know about • S.N. Bose, M.N. Saha, Maxwell, Clausius, Boltzmann, Joule, Wien, Einstein, Planck, Bohr, Heisenberg, Fermi, Dirac, Max Born, Bardeen.

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Class: - B.Sc. II year **I paper** **Physics**

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Geometrical Optics and Waves.	• Gain knowledge on various theories of light • Acquire skills to identify and apply formulas of optics and wave physics • Understand the properties of light like reflection, refraction, interference, diffraction etc • Understand the applications of diffraction and polarization. • Understand the applications of interference in design and working of interferometers. • Understand the resolving power of different optical instruments. • Gain knowledge on working of holography and their applications in various fields. • Gain knowledge in optical fiber and their applications in communication
II	Interference Of light	• Define constructive interference. • Explain how various wave properties affect interference.
III	Diffraction	• To recognize that light is a wave with a small wavelength. • To learn that diffraction is the bending of waves around an obstacle, and to differentiate this from projection. • To gain familiarity with single-slit and multi- slit diffraction patterns. • To learn that the dimensions of features in a diffraction pattern are inversely related to the dimensions of the object causing diffraction for small angles. • To apply the diffraction equations to determine the size of features on some common objects, including CDs and DVDs, hairs, etc.
IV	Polarization	• The focus of this lesson is to give students an opportunity to learn and apply concepts of polarization to understand wave nature of light and the difference between longitudinal and transverse waves. • They would then look for sources of polarized light around them and the method of analyzing if light is polarized or not and investigate polarization by reflection. Students will then discuss applications of polarized light to various phenomena including sun glasses, 3D

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Class: - B.Sc. II year **II paper** **Physics**

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Electrostatics	Students will be able to define • Static electricity. • Students will be able to explain what happens when neutral, positively charged, and/or negatively charged objects come into contact with one another. • Students will be able to identify what causes two objects to attract or repel from one another.
II	Magneto statics	• Illustrate the physical concepts of static electric fields. • Describe the physical concepts of static magnetic fields. • Apply the maxwell equations to solve problems in electromagnetic field theory. • Analyze the propagation of wave in different media.
III	Current electricity and Bio Electricity	• Students are able to understandthe concept of Potential difference and current and alsothe process of finding the unknown current in a loop using KVL and KCL. • Students will be able to understand the practical application of resistors and cells and it different combination in real life. • Students will be able to operate different electrical instruments like POT, Meter bridge, Galvanometer, Voltmeter, ammeter etc. also they learned to find the least count of given measuring instrument.
IV	Motion of Charged Particle in Electric and Magnetic field	• Student able to find out the trajectory of charged particle when it is entered in magnetic. • Able to find out force on moving charged particles in magnetic field. • Students are able to accelerate the charged particle.
V	Electrodynamics.	• Students will learn about the different method to induce an emf in a given conductor whichis useful to understand the concept of Mutual and self-induction. • Students acquires the basic knowledge about the Principle construction working and real life application of Transformer and Dynamo

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Class: - B.Sc. III year I paper

Physics

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Quantum Mechanics –I	• Pinpoint the historical aspects of development of quantum mechanics. • Understand and explain the differences between classical and quantum mechanics. • Understand the idea of wave function. • Understand the uncertainty relations. • Solve Schrodinger equation for simple potentials
II	Quantum Mechanics – II	• Understand Time independent Schrodinger equation: understand One dimensional potential well and barrier. • Boundary conditions. Bound and unbound states. • Calculate Reflection and transmission coefficients for a rectangular barrier in one dimension. • Understand Conceptof Free particle in one-dimensional box, and calculate eigen functions and eigen values of a free particle.
III	Atomic Spectroscopy	describe • The atomic spectra of one and two valance electron atoms. • Explain the change in behavior of atoms in external applied electric and magnetic field. • Explain rotational, vibrational, electronic and Raman spectra of molecules. • Describe electron spin and nuclear magnetic resonance spectroscopy and their applications.
IV	Molecular Spectroscopy	describe • The atomic spectra of one and two valance electron atoms. • Explain the change in behavior of atoms in external applied electric and magnetic field. • Explain rotational, vibrational, electronic and Raman spectra of molecules. • Describe electron spin and nuclear magnetic resonance spectroscopy and their applications.
V	Nuclear Physics and Elementary Particles	• After taking this course, students are able to determine the charge, mass of any nucleus by using various spectrographs. • They are able to understand the size of nucleus and all its properties. • This course has led the students to understand interaction of various types of radiation with matter which they observe in their daily life. It's easy for them now to relate the theory to practical. • Students now know various methods of accelerating various types of particles to perform scattering experiments. • Students are able to understand the detecting methods and instruments for different types of charged and neutral particles.

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Class: - B.Sc. III year II paper **Physics**

Unit	Course Content	Learning Outcome: - After Completion of Course student will able to-
I	Solid State Physics-I	• Understand concept of Crystal Structure. • Determination of crystal structure with X-rays. • know about various type of Bonding between atoms. • Understand Band theory of solids.
II	Solid State Physics-II	• Understand the concept of specific heats of solids • Know about Domains. • Understand of BH hysteresis. • Know about Super conductivity.
III	Semiconductor Devices- I	Students are able to classified solids • They know about semiconductor, types of Semiconductors (p and n). • Formation of Energy Bands, Energy level diagram. Conductivity and mobility. • Junction formation, Barrier formation in p-n junction diode. • Current flow mechanism in forward and reverse biased diode. • Transistors and it's Characteristics
IV	Semiconductor Devices- II	• Understand Basic concepts of amplitude, frequency and phase modulations and demodulation. • Understand Digital Electronics: Boolean Identities, De-Morgan's law, Logic gate and truth table.simple logics Circuits; Thermistors, solar cells. Concepts of Microprocessors and digital computer.
V	Nano Materials	After completing this course student will be able to: • Learn about the background on Nanoscience • Understand the synthesis of nanomaterials and their application and the impact of nanomaterials on environment • Apply their learned knowledge to develop Nanomaterial's.

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Class: B. Sc. 1st year **paper-1** **Zoology**

Unit	Course/Content	Learning Outcome: - After attend the class student able to learn.
1st	1. Elementary knowledge of Zoological Nomenclature and International Code 2. Classification of Lower Invertebrates (According to Parker Haswell 7th edition) (1. Protozoa 2. Porifera 3. Mollusca 4. Echinodermata 5. Nematohelminthes) 3. Classification of higher invertebrates (According to Parker Haswell 7th edition) (1. Annelida 2. Arthropoda 3. Mollusca 4. Echinodermata 5. Hemichordata)	Get knowledge about classification and phylogeny of invertebrates.
2nd	1. Protozoa: Type study of Plasmodium 2. Protozoa and Diseases 3. Porifera: Type study of Sycon 4. Coelenterata: Type study of Obelia 5. Corals and Coral Reef formation	Get knowledge about different protozoan disease and apply it for human welfare they know about the importance of colenterates and coral reef.
3rd	1. Helminthes: Type study of Fasciola hepatica 2. Pathogenic symptoms of Nematodes and diseases 3. Annelida: Type study of Earthworm 4. Coelom and Metamerism in Annelida 5. Structure and Significance of Trochophore larva	Students will be able to understand the anatomy and physiology of helminth animals.
4th	1. Arthopoda: Type study of Prawn(Palaemon) 2. Larval forms of Crustacea 3. Different types of mouth parts in insects 4. Insects as Vectors of human diseases 5. Mollusca: Type study of Pila(An Apple Snail)	Students learn about the animals of phylum arthopoda and mollusca they also get knowledge about their larvel forms.
5th	1. Echinodermata: External features and water vascular system of Star fish(Asterias) 2. Life history of Star fish 3. Larval forms of Echinoderms 4. Hemichordata: Type study of Balanoglossus 5. Affinities of Balanglossus.	Able to understand the anatomy and physiology of Starfish student study the minor Fila and learn about the hemichordet

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Class: B. Sc. 1st year **paper-2** **Zoology**

Unit	Course/Content	Learning Outcome: - After attend the class student able to learn.
1st	1. History of Cell Biology, Cell theory 2. Prokaryotic and Eukaryotic Cells Structure and functions of Plasma membrane. ➢ Structure and functions of Golgi body, ➢ Endoplasmic reticulum, Lysosomes. ➢ Structure and functions of Mitochondria, Ribosome, Centriole.	Students get knowledge about prokaryotic and Eukaryotic cell they learn the structure and function of different cell organelles.
2nd	➢ Structure and functions of Nucleus and Nucleolus ➢ Structure and functions of typical Chromosome ➢ Basic concept of Chromatin and Heterochromatin ➢ Structure and functions of Lamp brush and Polytene Chromosome ➢ Cell Cycle, Mitotic and Meiotic cell Division	They learn about the structure of nucleus and chromosomes they know that how to cell divide by mitosis and meiosis division.
3rd	1. Gametogenesis 2. Fertilization 3. Parthenogenesis 4. Regeneration 5. Stem cells sources, types and their uses	Students get knowledge about gametogenesis and fertilization they also learn about parthenogenesis and regeneration process.
4th	Development of Frog 1. Cleavage 2. Blastulation 3. Fate map construction 4. Gastrulation and formation of three germinal layers Structure of Tadpole Larva	Students able to learn the complete development of frog moroora blastula and gastrula.
5th	Development of Chick 1. Cleavage 2. Blastulation 3. Fate map construction 4. Gastrulation 5. Development of chick embryo upto formation of primitive streaks 6. Extra embryonic membranes in chicks	Student get knowledge about the embryonic development of chick up to the formation of primitive streak.

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Communication of Vision, Mission, POs, and Cos

At the onset of each academic term, faculty ensure that the COs of their respective courses are clearly conveyed to students.

COs are also uploaded on Midlife LMS platform

Apart from being prominently displayed on our official college website, vision, mission and PEOs find a place in our student journals providing consistent reminders of their educational journey's goals.

Vision, Mission and PEOs and POs are also displayed at various places in college like corridors and laboratories.

The induction programs at the start of every academic year serve as an orientation, where these outcomes and objectives are presented to both students and faculty.

For transparency and adherence to our goals, our exam question papers are mapped according to the COs and POs, providing students with a clear pathway to attain these outcomes.

Stakeholders, including parents, alumni, and faculty, are regularly apprised of these outcomes during various institute events, ensuring collective alignment and commitment.

In conclusion, our institute stands firm in its commitment to transparently convey and uphold its educational standards. By detailing and displaying our COs and POs across various platforms, we ensure that our stakeholders are always aware and aligned with our educational vision.

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