RAMAJEE DEGREE MAHAVIDYALAYA, BHISMAGIRI, GANJAM, ODISHA

PO (PROGRAMMING OUTCOME), PSO (PROGRAMME SPECIFIC OUTCOME)

AND CO (COURSE OUTCOME)

Aim

The aim of the curriculum is to enlighten the economy through the knowledge of prosperity, management and economic development of the economy. The programs offered by the Department of Economics are designed to

- This curriculum provides all those basic concepts on the branches like molecular biology, genetics, plant breeding, biostatistics, pathology, economic importance of crops, histological display of various plant parts.
- Prepare the student for employment in industry, professional examination like C.A, Banking, Company Secretary, Public Service Commissions for Central and State services, or to pursue graduate work toward such advanced degrees as the M.A. and Ph.D. in economics.
- What goods are produced and in what quantities to be produced by the productive resources which the economy possesses.
- Determination of relative prices and allocation of resources between commodities. How the level of national income and employment, aggregate consumption and investment and the general level of prices are determined.

OBJECTIVE

- The development of critical thinking skills and the accumulation of factual knowledge.
- Application of critical thinking to factual knowledge and the development of effective decision Making skills.
- The development of an understanding of Micro and Macroeconomic Theory and their Application to solve economic problems.
- The Development of an Understanding of Basic Statistics, Mathematical Methods for Economics and Regression Analysis and Their Application in Applied Research.
- Offering a diverse selection of courses to foster a broad knowledge base in this field.

N.B : E.C.C(Economics Core Course), U.G(Under Graduate)

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
E.C.C-1: Introductory Microeconomics	E.C.C-1: Introductory Microeconomics To study the economic behaviour of consumers firms and factor owners. After successful completion of Introductory	E.C.C-1: Introductory Microeconomics To study the economic behaviour of consumers firms and factor owners. After successful completion of Introductory

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
	Micro Economics, a student can think like an economist and can know how micro concepts can be applied to analyse real life situation.	Micro Economics, a student can think like an economist and can know how micro concepts can be applied to analyse real life situation.
E.C.C-2: Mathematical Methods for Economics I The main aim of this course is to transmit basic mathematics at UG level. After successful completion of this course, the student can apply mathematical techniques to economic theories.	The main aim of this course is to transmit basic mathematics at UG level.	After successful completion of this course, the student can apply mathematical techniques to economic theories.
E.C.C-3: Introductory Macroeconomics	To introduce the student to the basic concepts of macro economics.	After successful completion, the students can understand the determination and measurement of aggregate economic variables.
E.C.C-4: Mathematical Methods for Economics II	To transmit the basic mathematics which enables the study of economic theory at the U.G level	After successful completion, the students are able to evaluate, compare and support the solution.
E.C.C-5: Microeconomics I	To provide a sound training in micro economic theory for analysing the behaviour of individual agency.	After successful completion, one can use mathematical tools to analyse the behaviour of consumers and producers.
E.C.C-6: Macroeconomics I	This course introduces the students, key topics of macroeconomic theory and policy.	After completion of the study of this course, the students are expected to understand the effects economic policies on output, employment and price level.
E.C.C-7 : Statistical Methods for Economics	This course introduces some basic concepts and terminology that are fundamental to statistical analysis and inference.	After completion of the study of this course, the student can exhibit knowledge and understanding of the essential facts, concepts, theories and applications which are related to statistics

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
		and probability theory.
E.C.C-8 : Microeconomics II	Micro economics provides the conceptual clarity to the students coupled with the use of mathematical tools.	After completion of this course, the students will be able to understand the issue concerning efficiency & general welfare economics.
E.C.C-9: Macroeconomics II	This course is continuation of macroeconomic -1 and it aims at examining the important issues of macroeconomic theories and policies.	After completion of this course, the students are expected to understand how an open economy operates and how it may react to policy changes and exogenous shocks.
E.C.C-10: Public Economics	This course is the study of government policies from points of view of economic efficiency, equity and it aims maximum social welfare.	By the end of this course, the students will have sufficient knowledge and economic understanding of the major issues concerning taxation and public spending.
E.C.C-11: Indian Economy I	This course is the study of major trends in economic indicators and policies in India after independence.	By the end of this course, the student will be able to know the development process in India after independence.
E.C.C-12: Development Economics I	The course begins with discussion models of growth and techniques of development and also the role of state in economic development.	At the end of the course, students will be able to identity and analyse the basic theories and concepts related to economic development.
E.C.C-13 : Indian Economy II	This course examines the sector-specific polices and evaluates the empirical evidence.	At the end of this course the students will be able to identify and analyse current issues.
E.C.C-14: Development Economics II	This is the second module of the economic development sequence. The main aim of this course is to	After completion the study of this course, the students are expected to be fully aware of the economic

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
	reflect the role of globalization and increased international dependence on the process of development.	development problems at the international level. Critically analyze how economic development theories affect the practical application of development policies in a variety of local and international contexts.

Aims Of Education are given below

1. To develop democratic citizenship
2. To promote national integration
3. To improve vocational efficiency
4. To cultivate social, moral & spiritual values
5. To instil of scientific temper
6. To educate for modernisation
7. To attain economic self- suffiency
8. To cultivate international brotherhood
9. To generate value of ecological balance
10. To respect small family norms
11. To increase the productivity
10. Optimum utilisation of resources
12. To develop the feeling of gender indiscrimination
13. To transmit, preserve and promote culture

OBJECTIVE :

1. To increase physical development of a child
2. To provide moral education
3. To improve the social and economic efficiency
4. To develop the various skills like preparation of timeline, chart, model and aids
5. To promote mental health
6. To develop community life
7. To include love for nation
8. To develop the ability of judging, assessing and analysing critically

BA Programme
Learning Outcome
1st semester
Core-1: Basic in Education

intellectual skill:

a. Students will explain the concept of education and its relationship with philosophy.
b. Describe the contribution of philosophy to the field of education.
c. Evaluate the impact of western philosophy on Indian education.

Practical Skill:

a. Appreciate the contribution of various indian schools of philosophy to the field of education.
b. To develop different ideals and values of various philosophy.

Transferable skill:

a. Educate others to promote different ideals and valus provided by virous philosopher.
b. Application of idea principles in once own life

Core-2:

Education and society
intellectual skill:

a. Able or list various agencies of education and their function.
b. Appreciate the importance of education for social changes

Practical Skill:

a. Able to be a good citizen in the society.
b. Able to understand how education change a society.

Transferable skill:

a. Justify education as a sub system of society and how other sub system effect education.
b. Able to realise and understand human right education.

Core-3

The learner and learning process
intellectual skill:

a. establish relationship between education and psychology.
b. explain the concept of learning and factors affecting learning
c. explain different category of people from different personality type and the type of adjustment

Practical Skill:

a. explain the application of education psychology in teaching learning process
b. development and application of creative ability

Transferable skill:

a. reflect the contribution of various learning theories in teaching learning process
b. to judge a thing critically with reasoning

Core-4
Pedagogical skill

intellectual skill:

a. explain the concept of pedagogy
b. define different method of teaching
c. list out different approaches and method of teaching

Practical Skill:

a. different pedagogy from other allied concept
b. apply appropriate method of teaching in the class room

Transferable skill:

a. belief in practical method like project assignment and activity method

Core-5
Technology and innovation in education

intellectual skill:

a. explain with example various approaches to educational technology
b. explain the instructions design and its underlying principles

Practical Skill:

a. describe different models of teaching and their use in effective class room teaching
b. explain the concept, principles, modes process and barriers of Communication and its implication

Transferable skill:

a. prepare tlm while teaching in the class
b. help other to use ict in the class room teaching learning process

Core-6
Pedagogy of school subjects

intellectual skill:

a. achieve mastery over different method of teaching
b. list out different type of teaching learning methods
c. prepare a design plan

Practical Skill:

a. develops language skill
b. apply suitable method while teaching

Transferable skill:

a. to identify and relate everything with learning science

Core-7

Statistics in education

intellectual skill:

a. describes the importance of statistics in the field of education
b. develop graphical presentation of data

Practical Skill:

a. compute relevant measures of average and measures of variation
b. develop ability of research study

Transferable skill:

a. makes calculating easily
b. develops innovative ideas

Core -8

Curriculum development and educational guidance

intellectual skill:

a. to describe different considerations for curriculum planning
b. to explain the role of teacher in curriculum development

Practical Skill:

a. can choose a proper educational curriculum
b. can choose a proper vocation
c. can be able to solve personal problem

Transferable skill:

a. to identify major issues and trends in curriculum
b. to help others to choose a educational career and right vocation.

core-9

Educational assessment and evaluation

intellectual skill:

a. to establish the relationship among measurement, assessment and evaluation.
b. to classify educational objectives in term of specific behavioural from .

Practical Skill:

a. to list out different types of assessment techniques.
b. to prepare a good achievement test on any school subject.

Transferable skill:

Use wide range of assessment tools and techniques and contract these appropriately.

Core-10
Introduction to educational research

intellectual skill:

a. to identify types of research in education
b. to describe the procedure of preparation of research report.

Practical Skill:

a. to select and explain an appropriate method for a research study
b. to select appropriate tools and techniques for the collection of date.

Transferable skill:

a. To develop the innovative and creative india

Core -11

History of education in India

intellectual skill:

a. To describe education in ancient India, partially Vedic education
b. To evaluate the education system during British period with special emphasis on different commission and committees.

Practical Skill:

a. critically examines the education system in medieval India.
b. understands India her tag and achievement of national goals.

Transferable skill:

a. Transmits promotes and enriches the culture of country

Core-12

Comparative education

intellectual skill:

a. Explain the scope of comparative education
b. Critically analyse different curriculum and its structure of various countries.

Practical Skill:

a. Evaluate the curriculum of India with china japan UK and USA

Transferable skill:

a. To list out the factors of comparative education

Core -13
Educational planning, administration and management

intellectual skill:

a. To elaborate the steps in planning
b. To elaborate the principles of educational management

Practical Skill:

a. To describe the score of financing in education.
b. To choose a proper management planning and guidance

Transferable skill:

a. Properly perform duties on the service on the basics of management in planning

Core-14
contemporary concerns in Indian education

intellectual skill:

a. To explain the challenges of secondary education.
b. To explain present scenario of secondary and higher education.

Practical Skill:

a. To understand universalization of primary education and tens to achieve

Transferable skill:

a. To explain and transferable value education, environmental education and life skill education.

Dse-1
ict in education

intellectual skill:

a. To describe to needed teacher competencies for ict uses in the class room.
b. To describe the importance of open source of software in education.

Practical Skill:

a. To demonstrate the use of various computer software such as word proceeding and presentation.

Transferable skill:

a. To list and explain various approaches in adoption and use of ict in education.

Dse-2
Special Education
intellectual skill:

a. To explain the innovations and issues of social education.
b. To understand various educational interventions meant for spacial children.

Practical Skill:

a. To explain the role of resource teacher and special teacher.

Transferable skill:

a. To become a good teacher to teach disable children.
b. To identify different type of special category child.

Dse- 3
Distance education

intellectual skill:

a. To elaborate the curriculum process of distance education
b. To understand various modes of students support services

Practical Skill:

a. To develop clear idea about different type of distance educational institutions

Transferable skill:

a. To describe the historical perspective of distance education.

Dse -4
intellectual skill:

a. To develop broad idea about different type of research
b. Critically analyses the ideas

Practical Skill:

a. Helps to solve various problems of basics of enquiring truth.

Transferable skill:

a. Critically analyse all the problems based on scientific enquiry.

Aims

The study of history is a study of causes. E.H Carr. Man comes and passes by but history goes on telling history. It gives immortality to mortal man. Man invented history of record his own achievements also his failing he wanted the past to live for the present of live for the future. The memory of the bay gone ages and of great among generation is preserved on the pages of history. It teaches us human value morality curriculum knowledge and glimpses of our past for the bliss of leaving.

OBJECTIVE :

A nation without the sense of history has no future. So the objective of reading history is to collect the knowledge form the past and makes a man wise and enable him to strengthen his virtue. It promotes in man power to imagine circumstance and conditions other them his own. It judges an individuals and his past, it teaches he mankind and guide the nation.

C.C-1: History of India—I:

Intellectual skill:

The history of India is long and varied. It is very ancient as well as origin of mankind, growth of the civilization India, Tools and sources of Historical reconstruction.

Transferable skill:

Social stratification of the Aryans their religions believe, value of Vedas, Vedic philosophy etc.

C.C-2: Social Formations and Cultural Patterns of the Ancient World

Intellectual skill:

Origin and growth of mankind in the world. the primitive man and its habits, tools and weapon change of occupation, nomadic to human settlement.

Transferable skill:

Growth of the society and urbanization and its trade and commerce amongst the civilization which reached in the ? the culture of altheas the states Mendip of Sparta in the Greek culture.

C.C-3: History of India—II

Intellectual skill:

The expansion of agrarian country of India, social stratification, class varna jati untouchably, gender and marriage and succession of property right. Foundation of the empire and its greatness courses the border of Asia.

Transferable skill:

The hoary past of India, when the entire world with the exaction of Egypt and Mesopotamia and nothing by way of civilisation india was fortune enough to be the seat of a great empire boulder like Chandragupta Margay, great monarch like Ashok and its feudal safety.

C.C-4: Social Formations & Cultural Patterns of Odisha

Intellectual skill:

The regional history is no less important the history of Odisha begins since the long past the, but record evidence comes from the event kalinga war of 261 B.C ? With great impaired force like Magadha in print of enriched importance.

Transferable skill:

The History of Odisha ruler with the great movement like Kharavela, Bhumakar, the rules of Salidacabhar, Samavansi, Ganjam and the suryavsmisis. The development of its indigenous Art and Architecture, culture language is not the least in formation a state in the best of language during the colonial rule.

C.C-5: History of India-III (C.750-1206)

Intellectual skill:

Fall of the great imperialist monarchy there for The unity and integrity of the imperial power. The growth of feudalism in Indian sub continental history is and the point to be discussion.

Transferable skill:

To know the great Rajputs of India central India and Rasputin, the rastrakutas, poles, Ra, candelas' and chauhans. The proud of urbanization in medieval India the historical traditions.

C.C-6: Rise of Modern West-I

Intellectual skill:

Geographical explanation, the motives of voyage, colonisation. The renaissance in Europe growth of humanism in Europe, and its Art and culture.

Transferable skill:

Rapaid growth of renaissance and reformation its significance, industrialization and green revolution England.

C.C-7:History of India-IV (1206-1550)

Intellectual skill:

the early sultan rules its literacy Turkish tradition, foundation of sultan rule its programme position of kingship during the region of balban and Ala-ud- Khilagi.

Transferable skill:

Bhakti movement religion reformation monotheistic tradition in India Kabir, Nanak, Chaitanya and sultan movement.

C.C-8: Rise of Modern West-II

Intellectual skill:

Europe rises in social and political industrial revolution? Revolution American war and independence.

Transferable skill:

Renaissana its impact, Parliamentary reform, monarchy and the beginning of Prime minister in Great Britain.

C.C-9:History of India-V (C.1550-1605)

Intellectual skill:

Working of the Persian literature in the court affairs invasion of Babur Humayan the administration of Sher Shah and its revenue Administration and general progress.

Transferable skill:

The imperial government religion and rajput alliance Genera attitude of the Administration, land revenue internal and external trade and commerce.

C.C-10: History of India-VI (1605-1750)

Intellectual skill:

the state polity, role pf women in Mughal rule especially during the time of Jahangir and the culture of India in the field of Art and Architecture

Transferable skill:

The turmoil and the war of succession, reverse policies in religion and rajput policy. Rise of feudal poetry, reaction of jat satunarm Rajputs Sikh and Msvellthy.

C.C-11: History of Modern Europe (1780-1939)

Intellectual skill:

the fall of old regime due to the crisis the fall of monarchy and beginning new era the modern age. Rise fall of the great Empire of Napoleon of the Napoleanic regions in Europe.

Transferable skill:

Rise of war states from the turmoil and turning point to the world peace. The rise Italy and Germany . The era of Bismark and his relationship with Great power of Europe.

C.C-12: History of India-VII (1750-1857)

Intellectual skill:

fall of the great empires division of feudal powers, foreign intervention, sunset of empire and growth of British power decline of Indigenous trade industry education etc.

Transferable skill:

Drain of wealth land revenue policy trade and fiscal policy ruination of the Indian peasantry class, social morality and reactions the great uprising Somtala, Deccan and sepoys of India.

C.C-13: History of India-VIII (1857-1950)

Intellectual skill:

Failures led to the succession the Indian renaissance or reformation in the sphere of social, religion political, the rise of nationalism and freedom struggle.

Transferable skill:

Indian freedom struggle the turmsis and transitions to lead the congress, M.K Gandhi and the statyagraha movement , non-violence and quiet India attainment of independence Subash Bose and INA.

Understanding Social-Economic and Cultural Life : Study on Odisha

Intellectual skill:

the classical literature, Art Architecture, dance and folk literature. Buddhist and Jainism and the remains of Buddhist stupas and viharas.

Transferable skill:

Odisha its political history under the supremacy of sailodbhava, Bhaumakar, Somavansis, Ganga Gajapatiis of the Bhois. Lastly the Mughal rule the Maratha and the Britishes.

Department of political science

Aim of political Science:

Students will acquire a working knowledge of political system. This will include gaining and understanding of the nation's political institution, political culture and political ideologies as well as how public policy is decide upon and implemented.02

Objectives of Political Science:

Present opposing view point and alternative hypotheses on various issues. Effectively apply, reading, witting, Critical thinking and analytical skill to address significant issues in the political world effectively apply social scientific reasoning and theories to the analysis of a wide range of political issues.

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
Core course- 1 Understanding political theory	It introduces thestudents to the idea of political theory, its history and approaches, and an assessment of its critical and contemporary trends. Section B is designed to reconcile political theory and practice through reflections on the ideas and practices related to democracy.	Demonstrate understanding of eadings, analyse texts critically, effectively write papers, increase the quality of student's reading, writing, debate and critical thinking skills Improve student's understanding of how different theories define and approach the issue of development.
Core course- 2 Constitutional government and democracy in India	The course traces the embodiment of some of these conflicts in constitutional provisions, and shows how these have played out in political practice. It further encourages a study of state institutions in their mutual interaction, and in interaction with the larger	This course acquaints students with the constitutional design ofstate structures and institutions, and their actual working overtime. The Indian Constitution accommodates conflicting impulses (of liberty and justice, territorial decentralization and a strong union, for instance) within

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
	extra-constitutional environment.	itself.
Core course- 3 Political theory-concept and debates	Each concept is related to a crucial political issue that requires analysis with the aid of our conceptual understanding. This exercise is designed to encourage critical and reflective analysis and interpretation of social practices through the relevant conceptual toolkit.	This course would help the student familiarize with the basic normativeconcepts of political theory. This course also introduces the students to the important debates in the subject.
Core course- 4 Political process inindia	Actual politics in India diverges quite significantly from constitutionallegal rules. An understanding of the political process thus calls for a different mode of analysis – that offered by political sociology. This course maps the working of 'modern' institutions, premised on the existence of an individuated society.	It familiarizes students with the working of the Indian state, paying attention to the contradictory dynamics of modern state power.
Core course- 5 Introduction to comparative government and politics	This is a foundational course in comparative politics. The purpose is tofamiliarize students with the basic concepts and approaches to the study of comparative politics while analysing various themes of comparative analysis in developed and developing countries.	Students will have a stronger and more informed perspective on approaches to studying politics comparatively. Students will be familiar with the primary theories and concepts that form the building blocks of the subfield, especially as they apply to different states in the world. Students will develop their descriptive capacities and their ability to apply concepts to new country cases. Students will learn research methods and hypothesis writing, testing.
Core course-6	The course provides an	Students should demonstrate

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
Perspectives on Public Administration	**introduction to the discipline of public administration. Thispaper encompasses public administration in its historical context with an emphasis on the various classical and contemporary administrative theories. The course also explores some of the recent trends, including feminism and ecological conservation and how the call for greater democratization is restructuring public administration.**	**understanding of various activities of governmental administrators that fall under the rubric of public administration to include rule-making, rate- making, and other regulatory activities, policy making and the delivery of services and programs.**
Core course -7 Perspectives on International Relations And World History	**This paper seeks to equip students with the basic intellectual tools for understanding International Relations. It introduces students to some of the most important theoretical approaches for studying international relations. It provides a fairly comprehensive overview of the major political developments and events starting from the twentieth century. Students are expected to learn about the key milestones in world history and equip them with the tools to understand and analyze the same from different perspectives.**	**Demonstrate understanding basic facts about the world. Demonstrate capacity to theorize or explain political outcomes Demonstrate familiarity with current political debates.**
Core course -8 Political Processes and Institutions in	**In this course students will be trained in the application of Comparative**	**Be able to explain the similarities and differences between various types of**

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
Comparative Perspective	**methods to the study of politics. The course is comparative in both what we study and how we study. In the process the course aims to introduce undergraduate students to some of the range of issues, literature, and methods that cover comparative political.**	**polities and how they affect their behaviour.**
Core course -9 Public Policy and Administration in India	**The paper seeks to provide an introduction to the interface between public policyand administration in India. The essence of public policy lies in its effectiveness in translating the governing philosophy into programs and policies and making it a part of the community living. It deals with issues of decentralization.**	**Students will become familiar with a number of contemporary political issues and better understand their make-up and importance Students will understand the 20th century emergence of the modern administrative state as a result of the technological, social, economic and political pressures that have emerged in as the US industrialized and developed complex, interdependent systems.**
Core course -10 Global Politics	**This course introduces students to the key debates on the meaning andnature of globalization by addressing its political, economic, social, cultural and technological dimensions. In keeping with the most important debates within the globalization discourse, it imparts an understanding of the working of the world economy, its anchors and resistances offered by global social movements while analyzing the changing nature of**	**Demonstrate understanding basic facts about the world Demonstrate capacity to theorize or explain political outcomes Demonstrate familiarity with current political debatesDemonstrate skills in critical thinking. Demonstrate knowledge of social scientific inquiry norms and standards.**

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
	relationship between the state and trans-national actors and networks.	
Core course -11 Classical Political Philosophy	This course goes back to Greek antiquity and familiarizes students withthemanner in which the political questions were first posed. Machiavelli comes as an interlude inaugurating modern politics followed by Hobbes and Locke.	Students will demonstrate knowledge of key thinkers and concepts Students will compare thinkers on similar concept Students will use concepts to analyze new situations Students will explain the nature and value of normative thinking.
Core course -12 Indian Political Thought-I	This course introduces the specific elements of Indian PoliticalThoughts panning over two millennia. The basic focus of study is on individual thinkers whose ideas are however framed by specific themes. The course as a whole is meant to provide a sense of the broad streams of Indian thought while encouraging a specific knowledge of individual thinkers and texts.	Many Indian thinkers from ancient times have offered thoughts on politics and political institutions. The tradition in India originally has been that state and state-craft and politics were viewed as a part of the general philosophical tradition of the Vedas and Upanishads.
Core course -13 Modern Political Philosophy	Philosophy and politics are closely intertwined. We explore thisconvergence by identifying four main tendencies here. Students will be exposed to the manner in which the questions of politics have been posed in terms that have implications for larger questions of thought and existence.	Students will demonstrate knowledge of key thinkers and concepts Students will compare thinkers on similar concept Students will use concepts to analyse new situations.
Core course -14 Indian Political Thought-II	the course study of individual thinkers, the course introduces a	Demonstrate an understanding of various theoretical perspectives on

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
	widespan of thinkers and themes that defines the modernity of Indian political thought. The objective is to study general themes that have been produced by thinkers from varied social and temporal contexts.	**ethical responsibilities in Indian political life. Demonstrate an understanding of common ethical problems that arise in contemporary politics Demonstrate an understanding of the components of sound ethical judgment.**

ପସନ୍ଦ ଓ ଆସ୍ଥା ଭିତିକ ପାଠ୍ୟ ଖସଡା

- **ଲକ୍ଷ୍ୟ :** ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କର ଅନ୍ତର୍ନିହିତ ଚିନ୍ତା ଓ ଚେତନା ଶକ୍ତିର ପୂର୍ଣ୍ଣ ବିକାଶ ଘଟାଇବା ଏବଂ ସେମାନଙ୍କୁ ଜୀବନ ଓ କର୍ମ ସଂସ୍ଥାନ କ୍ଷେତ୍ରର ପୂର୍ଣ୍ଣ ସାମର୍ଥ୍ୟର ସହିତ ପ୍ରସ୍ତୁତି କରାଇବା ।
- **ଉଦ୍ଦେଶ୍ୟ :** ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କଠାରେ ମାନବିକ ମୂଲ୍ୟବୋଧର ଉଦ୍ରେକ କରି ସାମାଜିକ କଲ୍ୟାଣ କ୍ଷେତ୍ରରେ ପ୍ରେରଣା ଯୋଗାଇବା ଏବଂ ସେମାନଙ୍କ ବ୍ୟକ୍ତିତ୍ୱର ବିକାଶ ସାଧନ ଘଟାଇବା ସଙ୍ଗେ ସଙ୍ଗେ ଆତ୍ମନିର୍ଭରଶୀଳ କ୍ଷେତ୍ରରେ ସାହାର୍ଯ୍ୟ କରିବା ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ-୧

[ଓଡିଆ ସାହିତ୍ୟର ଇତିହାସ]

- **ଲକ୍ଷ୍ୟ :** ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ଭାଷାଭିତ୍ତିକ ଦକ୍ଷତାର ଅଭିବୃଦ୍ଧି କରିବା ତଥା ଓଡିଆ ଭାଷା ଓ ସାହିତ୍ୟ ସହିତ ପରିଚିତ କରାଇବା ।
- **ଉଦ୍ଦେଶ୍ୟ :** ଓଡିଆ ଭାଷାର ବିକାଶ ଦିଗରେ ସଚେତନ କରାଇବା ଏବଂ ବିଶ୍ୱସ୍ତରରେ ଓଡିଆ ଭାଷା ସାହିତ୍ୟର ପ୍ରଚାର କରିବା।ପ୍ରାଚୀନ,ମଧ୍ୟଯୁଗୀୟ ଗଦ୍ୟ ଓ ପଦ୍ୟ ସାହିତ୍ୟ ସହିତ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କୁ ପରିଚିତ କରାଇବା ଏବଂ ତତ୍ ସମ୍ପର୍କିତ ଭାଷାଜ୍ଞାନର ଅଭିବୃଦ୍ଧି ଘଟାଇବା ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଛାତ୍ରଛାତ୍ରୀମାନେ ଓଡିଆ ଭାଷାର ଇତିହାସ ଆଲୋଚନାରୁ ସଫଳତା ପୂର୍ବକ ପୁଙ୍ଖାନୁପୁଙ୍ଖ ଜ୍ଞାନ ଆରୋହଣ କରିବା ଏବଂ ସେହି ଭାଷାକୁ ଆଧାର କରି ନୂତନ ସାହିତ୍ୟ ସୃଜନ କରିବାରେ ସକ୍ଷମ ହୋଇପାରିଛନ୍ତି ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୨

[ଓଡିଆ ସାହିତ୍ୟର ଇତିହାସ]

- **ଲକ୍ଷ୍ୟ :** ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କଠାରେ ଓଡିଆ ଭାଷା ସମ୍ପର୍କିତ ଗଭୀର ଜ୍ଞାନ ସୃଷ୍ଟି କରିବା। ଓଡିଆ ଭାଷା ସହିତ ସୁପରିଚିତ କରାଇବାସହ ସେମାନଙ୍କଠାରେ ଭାଷାଭିତ୍ତିକ ଦକ୍ଷତାର ପୂର୍ଣ୍ଣ ମାତ୍ରାରେ ବିକାଶ ଲାଭ କରାଇବା।
- **ଉଦ୍ଦେଶ୍ୟ :** ବ୍ୟାକରଣ ବ୍ୟତୀତ ଗୋଟିଏ ଭାଷାର ଶୁଦ୍ଧ ଓ ମାର୍ଜିତ ରୂପ ପରିକଳ୍ପନା ଅସମ୍ଭବ । ଏହାକୁ ଦୃଷ୍ଟି ଆଗରେ ରଖି ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ଦୈନନ୍ଦିନ ଜୀବନରେ ବ୍ୟବହୃତ ଭାଷାକୁ ସଂଶୋଧନ କରିବା ପାଇଁ ବିଶେଷ୍ୟ,ବିଶେଷଣ,ସର୍ବନାମ,ଅବ୍ୟୟ,କ୍ରିୟା ଆଦି ବ୍ୟାକରଣ ତତ୍ତ୍ୱ ସମ୍ପର୍କିତ ଜ୍ଞାନ ସୃଷ୍ଟି କରିବା ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଆଲୋଚନା ପର୍ଯ୍ୟ।ଲୋଚନାରୁ ଅବଗତ ହୋଇଅଛୁ ଯେ,ଉପର ଲିଖିତ ଆଲୋଚିତ ବ୍ୟାକରଣ ତତ୍ତ୍ୱକୁ ଛାତ୍ରଛାତ୍ରୀମାନେ ପୂର୍ଣ୍ଣ ମାତ୍ରାରେ ଜ୍ଞାନ ଆରୋହଣ କରିବା ସହ ବ୍ୟବହାରିକ ଦିଗ କ୍ଷେତ୍ରରେ ତା'ର ସଫଳ ପ୍ରୟୋଗ କରିବାରେ ସକ୍ଷମ ହୋଇ ପାରିଛନ୍ତି ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୪

[ଓଡିଶାର ସାଂସ୍କୃତିକ ଅନୁଶୀଳନ]

- **ଲକ୍ଷ୍ୟ :** : ଓଡିଶାର କଳା,ସାହିତ୍ୟ,ଅଭିନୟ,ଭାସ୍କର୍ଯ୍ୟ,ଚାଲିଚଳଣି,ସାମାଜିକ ଜୀବନ,ଓଷାବ୍ରତ ଏପରିକି ଝୋଟି ମୁରୁଜ- ପ୍ରତ୍ୟେକରେ ସଂସ୍କୃତିର ଏକ ଗୋପନୀୟ ବିଜ୍ଞପ୍ତି ଆତ୍ମଗୋପନ କରିଛି । ତାକୁ ଉନ୍ମୋଚିତ କରି ଓଡିଆ ସଂସ୍କୃତିର ମହନୀୟତା ସମ୍ପର୍କରେ ଛାତ୍ରଛାତ୍ରୀମାନଙ୍କୁ ଅବଗତ କରାଇବା ହେଉଛି ଏହି ପାଠ୍ୟାଂଶର ଲକ୍ଷ୍ୟ।
- **ଉଦ୍ଦେଶ୍ୟ :**ଓଡିଶାର ସାଂସ୍କୃତିକ ପୃଷ୍ଠଭୂମି ସମ୍ପର୍କରେ ପାଠକକୁ ଅବହିତ କରିବା । ଓଡିଶାର ପର୍ବପର୍ବାଣି,ଓଷା।ବ୍ରତ ବିଭିନ୍ନ ପ୍ରସିଦ୍ଧି ଦୈବୀପୀଠର ମାହାତ୍ମ୍ୟ ଏବଂ କଳା ଚାତୁର୍ଯ୍ୟର ସାଂସ୍କୃତିକ ନିଦର୍ଶନ ପ୍ରଦାନ କରିବା ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଓଡିଶାର ସାଂସ୍କୃତିକ ଅନୁଶୀଳନ ଆଲୋଚନା ପରେ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ମଧ୍ୟରେ ସଂସ୍କୃତି ପ୍ରତି ଅଭିରୁଚି ଏବଂ ତାହାକୁ ବିଶ୍ୱଦରବାରରେ ପହଞ୍ଚାଇବାର ଦୃଢ଼ ଆତ୍ମବଳ ସୃଷ୍ଟି ହୋଇ ପାରିଛି ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୫

[ଓଡ଼ିଆ ଲୋକ ସାହିତ୍ୟ]

- **ଲକ୍ଷ୍ୟ :** ମାନବ ଜୀବନ ଜିଜ୍ଞାସା ଓ ମନୀଷାର ରସାଳ ଅଭିବ୍ୟକ୍ତି ହେଉଛି ଲୋକ ସାହିତ୍ୟ । ଏହି ସାହିତ୍ୟ ସମୁଦ୍ରପରି ଅଥଳ ଏବଂ ସାଗର ପରି ଅପରିସୀମ । ଏଥିରେ ସାଧାରଣ ଜନତାର ସୁଖ,ଦୁଃଖ,ହସ କାନ୍ଦର ପ୍ରତିବିମ୍ବିତ ହୋଇଅଛି । ତେଣୁ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କୁ ଏହି ସାହିତ୍ୟର ନିହିତ ଜୀବନଚର୍ଯ୍ୟା ଉପଲବ୍ଧି କରାଇବା ମୁଖ୍ୟ ଲକ୍ଷ୍ୟ ଅଟେ ।
- **ଉଦ୍ଦେଶ୍ୟ :** ସମୟରେ ଘୂର୍ଣ୍ଣନ ଚକ୍ରରେ ତଥା ସମୟର ପରିବର୍ତ୍ତନରେ ସହ ପରିବର୍ତ୍ତିତ ରୂପ ଧାରଣ କରିଛି ସାହିତ୍ୟ । ଏହି ସାହିତ୍ୟ କେଉଁ ଅନାଦି କାଳରୁ ଲୋକ ମାନଙ୍କୁ ମୁଖରୁ ପ୍ରସାରିତ ହୋଇ ତା'ର କଳେବରକୁ ବୃଦ୍ଧି କରିଅଛି । ସେହି ସମୟରେ ସୃଷ୍ଟି ହୋଇଥିବା କଳା ସାହିତ୍ୟ ଓ ସଂସ୍କୃତିକୁ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ଦ୍ୱାରା ସଂସାଧିତ କରି ତାହାର କିପରି ବିଶ୍ୱ ଦରବାରରେ ନିଜର ପରିଚୟ ସୃଷ୍ଟି କରିପାରିବ ତାହା ହିଁ ଉକ୍ତ ପାଠ୍ୟାଂଶ ଉଦ୍ଦେଶ୍ୟ ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଛାତ୍ରଛାତ୍ରୀମାନେ ଲୋକ ସାହିତ୍ୟର ଅଧ୍ୟୟନ ପୂର୍ଣ୍ଣ ଆଗ୍ରହ ସହକାରେ ସମ୍ପାଦନ କରିବା ସହ ଏହାକୁ ସୀମିତ ପରିସୀମା ମଧ୍ୟରେ ଆବଦ୍ଧ ନ ରଖି ବିଶ୍ୱବ୍ୟାପି କରାଇବାକୁ ଯତ୍.ପର ନାସ୍ତି ଉଦ୍ୟମ କରି ଆସୁଛନ୍ତି।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୬

[ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ- ପ୍ରାଚୀନରୁ ମଧ୍ୟ]

- **ଲକ୍ଷ୍ୟ :** ଓଡିଆ ସାହିତ୍ୟର ଇତିହାସ ପ୍ରାଚୀନରୁ ମଧ୍ୟଯୁଗ ପର୍ଯ୍ୟନ୍ତ ଏକ ଉନ୍ନତ ସାଂସ୍କୃତିକ ପରମ୍ପରା ସହିତ ଉତପ୍ରୋତ ଭାବେ ଜଡିତ । ତତକାଳୀନ ସାମାଜିକ,ସାଂସ୍କୃତିକ,ଅର୍ଥନୈତିକ ଓ ସାହିତ୍ୟ ଦିଗପ୍ରତି ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କୁ ଅବଗତ କରାଇବା ଏହି ପାଠ୍ୟାଂଶର ମୂଳଲକ୍ଷ୍ୟ ଅଟେ ।
- **ଉଦ୍ଦେଶ୍ୟ :** ସାରଳା ସାହିତ୍ୟ ଠାରୁ ଆରମ୍ଭ କରି ପଞ୍ଚସଖା ତଥା ରୀତି ଯୁଗୀୟ କବିମାନଙ୍କ କାବ୍ୟ କବିତାରେ ନିହିତ କାବ୍ୟିକ ଉପାଦାନ ଓ ଶୈଳୀ ବିଶେଷକୁ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କୁ ଅନୁପ୍ରାଣିତ କରାଇବା।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :**ଚମ୍ପୁ ,ଚଉପଦୀ ,ଚଉତିଶା ଆଦି ପ୍ରାଚୀନ ପଦ୍ୟର ପଠନ ଏବଂ ସାଙ୍ଗୀତିକତା, ଶୃଙ୍ଗାରିକତା ଆଦି କାବ୍ୟିକ ଉପାଦାନ ଅନୁସରଣରେ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ମଧ୍ୟରେ ନୂତନ ସାହିତ୍ୟ ସୃଷ୍ଟି ହୋଇପାରିଅଛି ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୭

[ଓଡ଼ିଆ ସାହିତ୍ୟର ଇତିହାସ- ଆଧୁନିକ]

- **ଲକ୍ଷ୍ୟ :** ଲୋକମାନଙ୍କ ରୁଚିର ପରିବର୍ତ୍ତନ ଘଟାଇ ପ୍ରାଚୀନ ସାହିତ୍ୟର ଗତାନୁଗତିକ ଧାରାକୁ ପ୍ରତିହତ କରି ଯେଉଁ ସାହିତ୍ୟ ସୃଷ୍ଟି ଘଟିଥିଲା ତାହା ଥିଲା ଆଧୁନିକ ସାହିତ୍ୟ। ଏହି ସାହିତ୍ୟର ପରିସର ଏବଂ ପୃଷ୍ଠ ଭୂମି ସମ୍ପର୍କରେ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ମଧ୍ୟରେ ଜ୍ଞାନର ଉଦବୋଧନ ଘଟାଇବା ଏହି ପାଠ୍ୟାଂଶର ମୂଳ ଲକ୍ଷ୍ୟ ଅଟେ।
- **ଉଦ୍ଦେଶ୍ୟ :** ରାଧାନାଥ ସାହିତ୍ୟକୁ ଆରମ୍ଭକରି ସତ୍ୟବାଦୀ ଓ ପ୍ରଗତିବାଦୀ ସାହିତ୍ୟ ମଧ୍ୟରେ ନିହିତ ଜାତୀୟତା ,ଆଧାତ୍ମିକତା ଏବଂ ମାନବିକତାର ଉପଲବ୍ଧି ହିଁ ଏହି ସାହିତ୍ୟର ଉଦ୍ଦେଶ୍ୟ ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୮

[ସାହିତ୍ୟର ଗଠନ ରୀତି]

- **ଲକ୍ଷ୍ୟ :** ସମାଜର ମୁଖ ଦର୍ପଣ ହେଉଛି ସାହିତ୍ୟ । ସାହିତ୍ୟ ମଧ୍ୟଦେଇ ସମାଜର ପ୍ରତ୍ୟେକଟି ବିଷୟ ପ୍ରତିବିମ୍ବିତ ହୋଇଥାଏ । ସେ ଗଳ୍ପ,ଉପନ୍ୟାସ, ନାଟକ ହେଉ ଆଥବା କାବ୍ୟକବିତା । ଏକ ସ୍ୱତନ୍ତ୍ର ଶୈଳୀର ଅନୁସରଣ ସୃଷ୍ଟି ହୋଇଥାଏ । ଉକ୍ତ ଶୈଳୀକୁ ଆଧାରକରି ନୂତନ ସାହିତ୍ୟିକ ସୃଜନ କରିବା ହେଇଛି ଏହି ପାଠ୍ୟାଂଶର ମୁଖ୍ୟ ଲକ୍ଷ୍ୟ ।
- **ଉଦ୍ଦେଶ୍ୟ :** ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କୁ ଏହି ପାଠ୍ୟାଂଶ ନିଖୁଣ ଭାବରେ ଉପସ୍ଥାପନ କରାଇ ସେମାନଙ୍କ ଅନ୍ତର୍ନିହିତ କଳାତ୍ମକ ସୃଜନୀ ଶକ୍ତିର ବିକାଶ ଘଟାଇବା ହେଉଛି ମୁଖ୍ୟ ଉଦ୍ଦେଶ୍ୟ ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଉକ୍ତ ପାଠ୍ୟାଂଶକୁ ପଠନ କରିବା ପରେ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ଠାରେ ଏକ ଅପରିସୀମ ସୃଜନ ଶକ୍ତିର ଉଦଗୀରଣର ଆଭାସ ପ୍ରାପ୍ତ ହୋଇଛି । ସହିତ୍ୟାନୁଯାୟୀ ବିବିଧ ଶୈଳୀର ଅବଲମ୍ବନରେ ବହୁ ଛାତ୍ରଛାତ୍ରୀ ନୂତନ ସାହିତ୍ୟ ସୃଷ୍ଟି କରିବାରେ ସକ୍ଷମ ହୋଇ ପାରିଛନ୍ତି ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୯

[ସାହିତ୍ୟ ତତ୍ତ୍ୱ : ପ୍ରାଚ୍ୟ ଓ ପାଶ୍ଚ୍ୟାତ୍ୟ]

- **ଲକ୍ଷ୍ୟ :** “ଲବଣ ବୀନା ବ୍ୟଞ୍ଜନ ନ ରୁଚ୍ୟତେ”। ଅର୍ଥାତ ଲୁଣ ବିନା ବ୍ୟଞ୍ଜନ(ତରକାରୀ)ଯେପରି ରୁଚିକରବୋଧ ହୋଇ ନ ଥାଏ, ସେହିପରି ଅଳଙ୍କାର ବିନା ସାହିତ୍ୟ ରସ ବୋଧ ହେବା ସମ୍ଭବ ହୋଇ ନ ଥାଏ । ଏହି ଉପାଦାନ ପ୍ରାଚ୍ୟ ଓ ପାଶ୍ଚ୍ୟାତ୍ୟ ସାହିତ୍ୟରେ ପୂର୍ଣ୍ଣ ମାତ୍ରାରେ ରହିଥିବାର ଦେଖିବାକୁ ମିଳେ । ଅତଃ ,ସେହି ସାହିତ୍ୟ ତତ୍ତ୍ୱକୁ ସମସ୍ତ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କୁ ଅବବୋଧ କରାଇବା ହେଉଛି ଏହି ପ୍ରଧାନ ପାଠ୍ୟାଂଶର ଅଭିପ୍ରାୟ ।
- **ଉଦ୍ଦେଶ୍ୟ :** ସାହିତ୍ୟର ଗଠନରୀତି ସମ୍ପର୍କିତ ଜ୍ଞାନ ଆରୋହଣ ପରେ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ଦ୍ୱାରା ସୃଷ୍ଟି ହେଉଥିବା ନୂତନ ସାହିତ୍ୟ ସର୍ଜନ କ୍ଷେତ୍ରରେ ରସ ,ଅଳଙ୍କାର,,ଧ୍ୱନି,ବକ୍ରୋକ୍ତି ଆଦି ଆଳଙ୍କାରିକ ଉପାଦାନର ସଫଳ ପ୍ରୟୋଗ ହେଉଛି ଏହାର ମୁଖ୍ୟ ଉଦ୍ଦେଶ୍ୟ । ଏତଦବ୍ୟତୀତ ସାହିତ୍ୟକୁ ସାର୍ବଜନୀନ କରାଇବା ମଧ ଏକ ମୁଖ୍ୟ ଉଦ୍ଦେଶ୍ୟ ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଛାତ୍ରଛାତ୍ରୀମାନେ ପ୍ରାଚ୍ୟ ସାହିତ୍ୟ ତତ୍ତ୍ୱ ସହ ପାଶ୍ଚ୍ୟାତ୍ୟ ସାହିତ୍ୟ ତତ୍ତ୍ୱ (କ୍ଲାସିକ ବାଦ,ରୋମାଣ୍ଟିକବାଦ ,ପ୍ରତୀକ ଓ ଚିତ୍ରକଳ୍ପବାଦ) ଆଦିକୁ ମନ ଯୋଗ ସହକାରେ ପଠନ ପୂର୍ବକ ତା’ର ସ୍ୱକୀୟ ସୃଷ୍ଟିରେ ଏ ସବୁର ସଫଳ ପ୍ରୟୋଗ କରିଥିବାର ଦେଖିବାକୁ ମିଳିଅଛି ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୧୦

[ଓଡିଆ କାବ୍ୟ କବିତା-ପ୍ରାଚୀନରୁ ଆଧୁନିକ]

- **ଲକ୍ଷ୍ୟ :** କେଉଁ ଆଦିମ କାଳରୁ ମଣିଷର ପ୍ରବୃତ୍ତି ସହ ସାହିତ୍ୟର ଗତି ନିରନ୍ତର ନଦୀ ଧାରା ତୁଲ୍ୟ ପ୍ରବାହିତ ହୋଇଆସୁଅଛି । ଯାହା ଆଧୁନିକତାର ରୂପ ଚର୍ଯ୍ୟା ଗ୍ରହଣ କରିଅଛି । ସରଳା ସାହିତ୍ୟଠାରୁ ଆରମ୍ଭକରି ଆଧୁନିକ ସାହିତ୍ୟ ପର୍ଯ୍ୟନ୍ତ ସୃଷ୍ଟି ଘଟିଥିବା ଓଡିଆ ସାହିତ୍ୟ ସମ୍ଭାରକୁ ଛାତ୍ରଛାତ୍ରୀଙ୍କ ଠାରେ ଅବଗତ କରାଇବା ।
- **ଉଦ୍ଦେଶ୍ୟ :** ମହାଭାରତ,ଲକ୍ଷ୍ମୀପୁରଣ , ଆଦି ପ୍ରାଚୀନ ସାହିତ୍ୟ ତଥା ଶବବାହକରମାନ ପବନ,ପାନ୍ଥଶାଳା ଭଳି ଆଧୁନିକ କବିତା ସମୂହରେ ଥିବା ମାନବିକ ମୂଲ୍ୟବୋଧ,ଆଧାତ୍ମିକତା ଚିନ୍ତା ଓ ଚେତନା ଛାତ୍ରଛାତ୍ରୀମାନଙ୍କ ମାନସ ପଟରେ ଉଦ୍ରେକ କରିବା ହେଉଛି ଉକ୍ତ ପାଠ୍ୟାଂଶର ମୁଖ୍ୟ ଉଦ୍ଦେଶ୍ୟ ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ପ୍ରାଚୀନ ସାହିତ୍ୟଠାରୁ ଆରମ୍ଭ କରି ଆଧୁନିକ ସାହିତ୍ୟ ପର୍ଯ୍ୟନ୍ତ ସୃଷ୍ଟି ହୋଇଥିବା ପାଠ୍ୟାଂଶ ଅନ୍ତର୍ଗତ ସମସ୍ତ ରଚନା ଛାତ୍ରଛାତ୍ରୀମାନେ ମନ ଯୋଗ ସହକାରେ ଅଧ୍ୟୟନ କରିବା ସହ ସେ ସମସ୍ତ ରଚନା ସମୂହରେ ନିହିତ ଥିବା ଚିନ୍ତା,ଚେତନା ଓ ଭାଷା ଭିତିକ ପ୍ରଭାବ ଦୃଷ୍ଟି ଗୋଚର ହୁଏ ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୧୧

[ଓଡିଆ କ୍ଷୁଦ୍ରଗଳ୍ପ ଓ ଉପନ୍ୟାସ]

- **ଲକ୍ଷ୍ୟ :** ଆଧୁନିକ ସାହିତ୍ୟର ଆଧୁନିକତମ ସୃଷ୍ଟି ଭାବରେ କ୍ଷୁଦ୍ରଗଳ୍ପ ଓ ଉପନ୍ୟାସ ହେଉଛି ଏକ ଜନପ୍ରିୟ ଶିଳ୍ପକଳା, ଏକ ବୈଚିତ୍ର୍ୟପୂର୍ଣ୍ଣ ସୃଷ୍ଟି କରିବ। ଆକାରରେ କ୍ଷୁଦ୍ର ହେଲେ ମଧ୍ୟ ଏଥିରେ ନିହିତ ରହିଛି ମାନବର ଚିରନ୍ତନ ବାସ୍ତବତା । ଉକ୍ତ ପାଠ୍ୟାଂଶ ମଧ୍ୟରେ ମଣିଷର ସୁଖ-ଦୁଃଖ,ହସ-କାନ୍ଦର ସନ୍ଧାନ କରାଇବା ହେଉଛି ଉକ୍ତ ପାଠ୍ୟାଂଶର ଲକ୍ଷ୍ୟ ଅଟେ ।
- **ଉଦ୍ଦେଶ୍ୟ :** ଜୀବନ ଓ ଜଗତର ବିବିଧ ରୂପକୁ ପ୍ରକାଶ କରିବା ଜୀବନର ଆମୂଳ ଉଦଘାଟନ କରିବା ଓ ଜୀବନର ବ୍ୟାଖ୍ୟା କରିବା । ବ୍ୟକ୍ତିତ୍ୱର ନିର୍ମାଣ କରାଇବା ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ରେବତୀ ,ଶିକାର,ବାଘର ବିଳାପ ଆଦି ଗଳ୍ପ ଓ ଛ 'ମାଣ ଆଠଗୁଣ୍ଠ ମାଟିର ମଣିଷ ଭଳି ଉପନ୍ୟାସରେ ନିହିତ ମାନବବାଦୀ ତଥା ସାମୁହିକ ଚେତନାର ପ୍ରତିଫଳନ ଦେଖିବାକୁ ମିଳେ ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୧୨

[ଓଡିଆ ନାଟକ ଓ ଏକାଙ୍କିକା]

- **ଲକ୍ଷ୍ୟ :** ନାଟକ ଓ ଏକାଙ୍କିକା ଏକ ଅଭିନୟ କଳା ।ଏହା ସାହିତ୍ୟର ଏକ ମୋନାରଥ କୃତି । ଜୀବନର ଯାବତୀୟ ସଂଘର୍ଷ ଓ ସାଙ୍ଘାତ ରୂପପାଏ ନାଟକରୁ । ମଣିଷର ସୁଖ ଦୁଃଖ,ହସ କାନ୍ଦ,ଆନନ୍ଦ ବିଷାଦର ନିଛକ ରୂପକୁ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କୁ ହୃଦୟଙ୍ଗମ କରାଇବା ଏହି ପାଠ୍ୟାଂଶର ଲକ୍ଷ୍ୟ ଅଟେ ।
- **ଉଦ୍ଦେଶ୍ୟ :** ଜଗତର ସମସ୍ତଜ୍ଞାନ,ବିଦ୍ୟାଳୟ,ଶିଳ୍ପକର୍ମ,କଳା ଓ ଯୋଗ ଆଦି ନାଟକରୁ ହିଁ ପ୍ରାପ୍ତ ହୁଏ । ଏହା ସହିତ ଛାତ୍ରଛାତ୍ରୀମାନଙ୍କ ଜୀବନରେ ନାଟକ ଓ ଏକଙ୍କିକା ମାଧ୍ୟମରେ ସାମାଜିକ,ରାଜନୈତିକ ,ଅର୍ଥନୈତିକ,ଦର୍ଶନର ପ୍ରଭାବ ପକାଇବା ହେଉଛି ମୁଖ୍ୟ ଉଦ୍ଦେଶ୍ୟ ।

- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଛାତ୍ରଛାତ୍ରୀମାନଙ୍କ ଦ୍ୱାରା ଉକ୍ତ ପ୍ରଧାନ ପାଠ୍ୟାଂଶଟି ଅଧ୍ୟୟନ କରାଯିବା ଫଳରେ ସେମାନଙ୍କ ବ୍ୟକ୍ତିଗତ ଜୀବନରେ ଉପରୋକ୍ତ ସମସ୍ତ ଦାର୍ଶନିକ ତତ୍ତ୍ୱର ପ୍ରଭାବ ପରିଲିକ୍ଷିତ ହୋଇଅଛି ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୧୩

[ଓଡିଆ ଜୀବନୀ,ଆତ୍ମ ଜୀବନୀ,ଭ୍ରମଣ କାହାଣୀ ଓ ଅନୁବାଦ]

- **ଲକ୍ଷ୍ୟ :** ସାମାଜିକ,ରାଜନୈତିକ,ଦାର୍ଶନିକ,ବୈଜ୍ଞାନିକ ଓ ସାହିତ୍ୟିକ ପ୍ରଭୃତି ବିଭିନ୍ନ କ୍ଷେତ୍ରରେ ମହାନ ଅବଦାନ ଦେଇ ପ୍ରତିଷ୍ଠା ଓ ପ୍ରସିଦ୍ଧି ଅର୍ଜନ ବ୍ୟକ୍ତି ମାନଙ୍କର ପାରିକସ୍ଥିତି,ଜୀବନର ଘାତ ପ୍ରତିଘାତ, ବାଲ୍ୟ ଯୌବନ ତଥା ଶିକ୍ଷା ଦୀକ୍ଷା ପ୍ରଭୃତି ସମ୍ପର୍କରେ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କର ଜାଣିବାର ଇଚ୍ଛାକୁ ସଫଳ ରୂପାଯନ କରିବା ଏହାର ଲକ୍ଷ୍ୟ ଅଟେ ।
- **ଉଦ୍ଦେଶ୍ୟ :** ସାଧାରଣତଃ କୌଣସି ବିଶିଷ୍ଟ ସମାଜ ସେବକ,ରାଜନୈତିକ,ବୀର,କଳାକାର,ବୈଜ୍ଞାନିକ,ଦାର୍ଶନିକ ଓ ଭ୍ରମଣକାରଙ୍କ ଜୀବନର ନାନାବିଧ କାର୍ଯ୍ୟକାଳାପ ଓ ଭ୍ରମଣ ବୃତ୍ତାନ୍ତକୁ ଛାତ୍ରଛାତ୍ରୀଙ୍କ ନିକଟରେ ପହଞ୍ଚାଇବା ଓ ତା'ର ପ୍ରଭାବ ପକାଇବା ହେଉଛି ଉକ୍ତ ପାଠ୍ୟାଂଶର ମୁଖ୍ୟ ଉଦ୍ଦେଶ୍ୟ ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଉକ୍ତ ପ୍ରଧାନ ପାଠ୍ୟାଂଶକୁ ପଠନ କରିବାପରେ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ଜୀବନରେ ବେଶ ପରିବର୍ତ୍ତନ ଦୃଷ୍ଟିଗୋଚର ହୋଇଛି । ସେମାନେ "ମହାଜନଗତଃ ସ ପନ୍ଥା " ନୀତିକୁ ଅନୁସରଣ କରି ଜୀବନ ଚର୍ଯ୍ୟା ବିତାଇବା ପାଇଁ ବଦ୍ଧ ପରିକର ହୋଇଛନ୍ତି ।

ପ୍ରଧାନ ପାଠ୍ୟାଂଶ -୧୪

[ସାହିତ୍ୟର ଗଠନ ରୀତି]

- **ଲକ୍ଷ୍ୟ :** ପ୍ରବନ୍ଧ ଓ ସୋମାଲୋଚନା ସାଂପ୍ରତିକ ଗଦ୍ୟର ବଳିଷ୍ଠ ବିଭାଗ, ଏକ ବୌଦ୍ଧିକ ବିସ୍ଫୋରଣ । ପ୍ରବନ୍ଧ ମାଧ୍ୟମରେ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ଠାରେ ଜ୍ଞାନ-ବିଜ୍ଞାନ,ଚିନ୍ତା-ଚେତନା,କ୍ରିୟା,ପ୍ରତିକ୍ରିୟାର ବଳିଷ୍ଠ ପରି ପ୍ରକାଶ କରିବା ।
- **ଉଦ୍ଦେଶ୍ୟ :** ପ୍ରବନ୍ଧ ସମାଲୋଚନ ମାଧ୍ୟମରେ ଛାତ୍ରଛାତ୍ରୀମାନଙ୍କ ଅନ୍ତର୍ନିହିତ ଭାବାବେଗକୁ ଯୁକ୍ତି ଯୁକ୍ତ ଓ ନିର୍ଦ୍ଧିଷ୍ଟ ପରିସର ମଧ୍ୟରେ ପ୍ରକାଶ କରିବା ହେଉଛି ଉକ୍ତ ପ୍ରଧାନ ପାଠ୍ୟାଂଶର ଉଦ୍ଦେଶ୍ୟ ।
- **ଶିକ୍ଷଣ ଫଳାଫଳ :** ଛାତ୍ରଛାତ୍ରୀମାନେ ଏହା ପଠନ କରିବା ଫଳରେ ସେମାନଙ୍କର ବୌଦ୍ଧିକ ତଥା ସୂକ୍ଷ୍ମ ଚିନ୍ତନର ପରିପ୍ରକାଶ ଘଟିଥିବା ଲକ୍ଷ୍ୟ ହୋଇଅଛି । ଜାତୀୟ ଜୀବନ,ଯୌବନ,ବିଶ୍ୱଭାତୃତ୍ୱ ,ଜନ୍ମଭୂମି ଆଦି ପ୍ରବନ୍ଧ ବ୍ୟତୀତ କାଳିଦାସ ଓ ତପସ୍ୱିନୀ,ରାଧାନାଥ,ଓ ନୀଳକଣ୍ଠ କାବ୍ୟ-ଭାବନା ଆଦି ସମାଲୋଚନା ସାହିତ୍ୟ ଛାତ୍ରଛାତ୍ରୀ ମାନଙ୍କ ବୌଦ୍ଧିକ ବିକାଶରେ ବେଶ ସହାୟକ ହୋଇଥିବା ସୂଚନା ମିଳେ ।

Aim

- **The aim of this programme is to broaden the minds with modern scientific discoveries that will be useful to adopt with the various needs of human being and to continue with the par excellent research works in India.**
- **As the curriculum provides relevant knowledge on plants with both traditional and modern description , it will enrich the brains of students with the basic concepts of Botany and also allow them to think in relevance with modernity.**
- **The plant science now a days is being correlated with different other branches of science like forensics, marine biology, biotechnology, tissue culture, agriculture, horticulture, sericulture, biostatistics, economics etc.**
- **This curriculum provides all those basic concepts on the branches like molecular biology, genetics, plant breeding, biostatistics, pathology, economic importance of crops, histological display of various plant parts.**
- **Talking about basic botany, it gives a broad idea about ecology, environment and its protection, life cycles of various categories of plants around us.**
- **Phytogeographical studies throw light on different kinds of forests, land masses and zones of the world with wide range of habitat.**
- **Reproductive biology enriches the minds with new innovative ideas to produce varieties of plants as per the human demand.**
- **Moreover this curriculum provides an equal opportunity for the students to compete with the students of other big universities of India and abroad.**

OBJECTIVE :

This curriculum can help students with achieving objects like…

- **To make survey of different plants of various geographic area and classify them properly.**
- **To help in preservation, conservation and sustainability development.**
- **To carry out botanical, horticultural and chemical research for plant improvement and utilization.**
- **To offer facilities for the improvement of medicinal values of plants to be utilised in various pharmacy industries.**
- **To engage in activities, conducive to help botanical teaching and to create public understanding the value of plant research in general and the need for preserving our plant wealth.**
- **To establish tissue culture facility with special reference to the improvement of seeds/fruits/ flowers and quick and easy propagation.**
- **To work in collaboration with similar institutes in india.**
- **To promote and establish modern scientific research and development studies relating to plants of importance to India.**

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
CC-I-Microbiology and Phycology	To study about Bacteria, Virus and different classes of Algae.	A student can gain knowledge about the basics of life and lower group of plants which originated as primitive and still have existance with developed plants.
CC-II-Bio molecules and Cell biology	To read in detail about the different living and nonliving cell organelles and their structure and function. Also to read different bio molecules present in plant body.	Students can understand about the basic functional units of life when they are clear about the cell and the biomolecules like protein, carbohydrates, lipds, nucleic acids etc.
CC-III-Mycology and Phytopathology	To study about different classes of Fungi and disease causing fungal agents in nature with symptoms and irradiation.	A student can attain wisdom to the vast field of mycology and can contribute for environment protection, drug manufacturing, industry, food etc.
CC-IV-Archegoniate	To read about other plant groups other then Thallophyta, like Bryophytes, Pteridophytes and gymnosperms.	This branch provides a field to understand and work on the evolution of life on earth on a systematic manner, thus throwing light to understand life well
CC-V-Anatomy of Angiosperms	Histology is the study that provides knowledge in detail about the anatomy and the different types tissue that are present in plant body.	To know about anything always comes from its internal structure, arrangement of various systems and their function. It gives a realistic interpretation of a plant function.
CC-VI-Economic Botany	It classifies the plants as per their productive materials and their economic value for the mankind.	This is a ink between plants and their anthropogenic uses in agronomy, chemistry, economics,forestry, horticulture, medicine, microbiology, pharmacognosy etc.
CC-VII-Genetics	It gives a broad idea about the origin of genetics, modern trends about the genetic developments along with population and evolutionary genetics	It is a branch of biology concerned with the study f genes, genetic variation, and heredity in organisms. we need to look deep into our genes which provides a detail data of our origin tree, development and a need for future changes.
CC-VIII-Molecular Biology	A broad idea is depicted about DNA,RNA, their replications, central dogma on protein synthesis,operon	Molecular biology is the study of biology at a molecular level. The field overlaps with other areas of biology and chemistry, particularly genetics

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
	concept and other gene regulations	and biochemistry. Molecular biology chiefly concerns itself with understanding the interactions between the various systems of a cell, including the interrelationship of DNA, RNA and protein synthesis and learning how these interactions are regulated.
CC-IX-Plant Ecology and Phytogeography	It enhances the knowledge about different factors of ecology, biotic interactions, functional aspects of ecosystems, plant communities etc.	Plant ecology is a subdiscipline of ecology which studies the distribution and abundance of plants, the effects of environmental factors upon the abundance of plants, and the interactions among and between plants and other organisms. Phytogeography is concerned with all aspects of plant distribution, from the controls on the distribution of individual species ranges
CC-X-Plant Systematic	It is a study about significance of plant systematic, nomenclature, system of classification, phylogeny and different classes.	It is a science that includes and encompasses traditional taxonomy; however, its primary goal is to reconstruct the evolutionary history of plant life. It divides plants into taxonomic groups, using morphological, anatomical, embryological, chromosomal and chemical data.
CC-XI-Reproductive Biology of Angiosperms	It is the study of embryological developments in plants, pollination, fertilization ,embryo and seed formation.	A student should know well about the reproduction style of a plant, about the flowers, the fruits and seeds. This will lead to many breeding projects and production of mutational plants to overcome over demanded human needs.
CC-XII-Plant Physiology	It is the basic knowledge about a plant describing about the physiological processes like plant-water relation, mineral nutrition, translocation, growth regulators,	Physiology is extremely important, this determines how well new cultivars can handle stresses like drought, salinity, heat, etc. Also yield improvements are also tracked in this manner. Plant physiology explains how plants function in all environments.
CC-XIII-Plant Metabolism	Another branch of botany	Plant metabolism is defined as the

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
	dealing with the plant metabolism like carbon assimilation, carbon oxidation, lipid metabolism, nitrogen metabolism etc.	complex of physical and chemical events of photosynthesis, respiration, and the synthesis and degradation of organic compounds.produces products that aid in the growth and development of plants which are the basic needs for a student to go for further research in future.
CC-XIV-Plant Biotechnology	It is a modern branch of plant science dealing with tissue culture, Recombinant DNA technology, gene transfer methods, and different ways of bio technology applications.	Plant biotechnology, in the sense of the application of recombinant DNA techniques to crop improvement, or the production of valuable molecules in plants, is still a relatively new endeavour. Plants are already used as sources of an immense array of useful molecules. These, especially the starches, proteins and oils in seeds, are raw materials for most of our food and feedstuffs. Plants are also the major sources of fibre for building materials, clothing and paper. Therefore, the possibilities for improving current products and making new products by means of plant biotechnology are, in principle, almost limitless.
DSE-I-Stress Biology	A new branch of botany dealing with plant stress, stress sensing mechanisms, and various ways to protect the plants against stress.	Globally, abiotic stresses are amongst the major limitations for sustainable agriculture. Today’s plant science faces a major challenge to achieve the goal of developing climate-resilient crops that can tolerate diverse environmental stresses. Two such major impediments are: a lack of sufficient understanding of the molecular mechanisms of stress response, and technological limitations in translating the proof-of-concept studies from model to crop plants. This can be overcome by knowing the stress obtaing by plants and its irradiation.
DSE-II-Plant Breeding	It deals with modern ideas about plant breeding, methods for crop	Students have a future propcet as Plant breeding is a method of altering the genetic pattern of plants to

PROGRAMME/COURSE	COURSE SPECIFIC OUT COME	LEARNING OUT COME
	improvement etc.	increase their value and utility for human welfare. It is a purposeful manipulation of plants to create desired plant types that are better suited for cultivation, give better yield and are disease resistant.
E-III-Natural resource management	It gives an idea about sustainable utilization of natural resources like land, water, biological properties, national biodiversity, types of forest and their management and energy resources.	Natural resource management refers to the management of natural resources such as land, water, soil, biodiversity, planning and management. It will give a new dimension for the students who will work for conservation of natural resourses for sustainable development.
DSE-IV-Biostatistics	This is an important branch of mathematics in relation to al branches in calculating the accuracy of finding values and putting them for better results.	It is a must study for the students as the goal is to disentangle the data received and make a valid inference that can be used to solve problems in different field of research work and detailed studies.
GE-I-Biodiversity (different type study)	It is the traditional wing of botany dealing with structure and reproduction patterns in bacteria, virus, alga, fungi, bryophytes, pteridophytes and gymnosperms.	A student can gain minimum idea about different plant species including bacteria and virus which will help them to understand the evolutionary trends in plant development and reproductive behaviour.
GE-II-Economic Botany and Plant Biotechnology	This section deals with the importance of economically important plants and also biotechnological chapters like Recombinant DNA Techniques: Blotting techniques: Northern, Southern and Western Blotting, DNA Fingerprinting etc.	A non-botany student can gain modern prospective of the economic uses of the plants as well as the revolutionary developments in biotechnological studies to go beyond the traditional ideas on the subject.

Aims

- **To develop an ability to observe, to analyze and to interpret objectively and to make rational decisions and to solve problems involving chemistry.**
- **To develop manipulative and experimental skills, communicative skills used in the study of chemistry.**
- **To develop attitudes on**
    - **which scientific investigations depend, such as curiosity, honesty, persistence, Critical thinking, willingness to suspend Judgment and tolerance of uncertainty.**
    - **An appreciation of the applications of chemistry in daily life.**
    - **An understanding of the concepts and theories in chemistry.**
    - **an awareness of the social, economic, environmental and Technological implications of chemistry**
    - **An awareness of the provisional nature of explanations about Natural phenomena and the complex relationships between phenomena.**

Objectives

- **To understand the importance of the Periodic Table of the Elements, how it came to be, and its role in organizing chemical information.**
- **To understand the interdisciplinary nature of chemistry and to integrate knowledge of mathematics, physics and other disciplines to a wide variety of chemical problems.**
- **To learn the laboratory skills needed to design, safely conduct and interpret chemical research.**
- **To acquire a foundation of chemistry of sufficient breadth and depth to enable them to understand and critically interpret the primary chemical literature.**
- **To develop the ability to effectively communicate scientific information and research results in written and oral formats.**
- **To learn professionalism, including the ability to work in teams and apply basic ethical principles.**
- **To provide students with some insight into future career prospect in the fields related to Chemistry.**

B.Sc (Chemistry core) Programme

Learning Outcomes

a) Core-I (Inorganic Chemistry)

i) Intellectual skill:

- **The ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject areas identified.**
- **The ability to apply such knowledge and understanding to the solution of qualitative and quantitative problems mostly of a familiar nature**

ii) Practical skill:

- **Skills in the operation of standard chemical instrumentation.**
- **The ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory.**

iii) Transferable skill:

- **Work independently and collaborate effectively with other people in a team.**
- **Self-evaluate their own learning progress, and develop motivation and learning skills for lifelong learning.**

b) Core-II (Physical Chemistry)

i) Intellectual skill:-

- **Formulate and analyze a wide range of analytical and synthetic chemical problems by applying chemical principles.**
- **Analyze and interpret experimental data, critically assess data in literature and extract data from it useful.**

ii) Practical skill:

- **The ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory.**

iii) Transferable skill:-

- **Numeracy and mathematical skills, including such aspects as error analysis order-of-magnitude estimations, correct use of units and modes of data presentation.**
- **Information retrieval skills, in relation to primary and secondary information sources, including information retrieval through online computer searches**

c) Core-III (Organic Chemistry)

i) Intellectual skill:

- **Skills in the evaluation, interpretation and synthesis of chemical information and data Skills in the practical application of theory using computer software and models**

ii) Practical skill:-

- **Conduct standard laboratory procedures involved in synthetic and instrumental work. Operate a range of chemical instrumentation with adequate hands-on experiences.**

iii) Transferable skill:-

- **Numeracy and mathematical skills, including such aspects as error analysis order-of-magnitude estimations, correct use of units and modes of data presentation**
- **Information retrieval skills, in relation to primary and secondary information sources, including information retrieval through online computer searches**

d) Core-IV (Physical Chemistry)

i) Intellectual skill:-

- **The ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject areas identified**

ii) Practical skill:-

- **Skills in the operation of standard chemical instrumentation**
- **The ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory.**

iii) Transferable skill:-

- **Demonstrate information technology skills, especially in the areas of information retrieval, literature searching and use of library databases.**
- **Work independently and collaborate effectively with other people in a team.**

e) Core-V (Inorganic Chemistry)

i) Intellectual skill:-

- **The ability to recognize and analyses problems and plan strategies for their solution Skills in the evaluation, interpretation and synthesis of chemical information and data**

ii) Practical skill:-

- **Skills required for the conduct of documented laboratory procedures involved in synthetic and analytical work, in relation to both inorganic systems**

iii) Transferable skill:-

- **Work independently and collaborate effectively with other people in a team.**
- **Self-evaluate their own learning progress, and develop motivation and learning skills for lifelong learning.**

f) Core-VI (Organic Chemistry)

i) Intellectual skill:-

- **The ability to apply such knowledge and understanding to the solution of qualitative and quantitative problems mostly of a familiar nature in organic chemistry.**
- **The ability to recognize and analyze problems and plan strategies for their solution.**

ii) Practical skill:-

- **Skills required for the conduct of documented laboratory procedures involved in synthetic and analytical work, in relation to organic systems**
- **Skills in the monitoring, by observation and measurement, of chemical properties, events or changes, and the systematic and reliable recording and documentation thereof**

iii) Transferable skill:-

- **Numeracy and mathematical skills, including such aspects as error analysis order-of-magnitude estimations, correct use of units and modes of data presentation**
- **Information retrieval skills, in relation to primary and secondary information sources, including•information retrieval through online computer searches**

g) Core-VII (Physical Chemistry)

i) Intellectual skill:

- **Obtain and integrate several lines of subject-specific evidence to formulate and test hypotheses Recognize the moral and ethical issues of investigations and appreciate the need for ethical standards and professional codes of conduct.**

ii) Practical skill

- **The ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory.**
- **Access and manage the risks of chemical substances and laboratory procedures by evaluating their potential impact on the environment.**

iii) Transferable skill:-

- **Consider strategies for providing effective technical support**
- **Gain confidence in the support you provide for the science department and students**

h) Core-VIII (Inorganic Chemistry)

i) Intellectual skill:-

- **Skills in the evaluation, interpretation and synthesis of chemical information and data**
- **The ability to apply such knowledge and understanding to the solution of qualitative and quantitative problems mostly of a familiar nature**

ii) Practical skill:-

- **Skills in the operation of standard chemical instrumentation**
- **The ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory.**

iii) Transferable skill:-

- **Work independently and collaborate effectively with other people in a team.**
- **Self-evaluate their own learning progress, and develop motivation and learning skills for lifelong learning.**

i) Core-IX (Organic Chemistry)

i)i) Intellectual skill:-

- **Show appreciation of chemistry and its interface with social and daily life such as environmental issues, and arouse audience's interest in chemistry.**
- **Use a global perspective in conjunction with knowledge of science to view issues in chemistry.**

ii) Practical skill:-

- **Skills required for the conduct of documented laboratory procedures involved in synthetic and analytical work, in relation to organic systems**
- **Skills in the monitoring, by observation and measurement, of chemical properties, events or changes, and the systematic and reliable recording and documentation thereof**

iii) Transferable skill:-

- **Demonstrate information technology skills, especially in the areas of information retrieval, literature searching and use of library databases.**
- **Work independently and collaborate effectively with other people in a team.**

j) Core-X (Physical Chemistry)

i) Intellectual skill:-

- **Obtain and integrate several lines of subject-specific evidence to formulate and test hypotheses**

ii) Practical skill:-

- **Skills required for the conduct of documented laboratory procedures involved in synthetic and analytical work, in relation physical systems**
- **The ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory.**

iii) Transferable skill:-

- **Demonstrate information technology skills, especially in the areas of information retrieval, literature searching and use of library databases.**
- **Work independently and collaborate effectively with other people in a team.**

k) Core-XI (Organic Chemistry)

i) Intellectual skill:

- **The ability to apply such knowledge and understanding to the solution of qualitative and quantitative problems mostly of a familiar nature in organic chemistry.**
- **The ability to recognize and analyze problems and plan strategies for their solution**

ii) Practical skill:-

- **Skills required for the conduct of documented laboratory procedures involved in synthetic and analytical work, in relation to organic systems**
- **Skills in the monitoring, by observation and measurement, of chemical properties, events or changes, and the systematic and reliable recording and documentation thereof**

iii) Transferable skill:-

- **Numeracy and mathematical skills, including such aspects as error analysis order-of-magnitude estimations, correct use of units and modes of data presentation**
- **Information retrieval skills, in relation to primary and secondary information sources, including information retrieval through online computer searches**

l) Core-XII (Physical Chemistry)

i) Intellectual skill:-

- **The ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject areas identified**
- **Skills in the practical application of theory using computer software and models**

ii) Practical skill:-

- **Preparing, processing, interpreting and presenting data, using appropriate qualitative and quantitative techniques, statistical programmes, spreadsheets and programs for presenting data visually.**
  Citing and referencing work in an appropriate manner

iii) Transferable skill:-

- **Problem-solving skills, relating to qualitative and quantitative information**
- **Numeracy and mathematical skills, including such aspects as error analysis order-of-magnitude estimations, correct use of units and modes of data presentation**

m) Core-XIII (Inorganic Chemistry)

i) Intellectual skill:-

- **The ability to apply such knowledge and understanding to the solution of qualitative and quantitative problems mostly of a familiar nature**
- **The ability to recognize and analyze problems and plan strategies for their solution**

ii) Practical skill:-

- **Skills in the safe-handling of chemical materials, taking into account their physical and chemical properties including any specific hazards associated with their use and the ability to conduct risk assessments**
- **Skills required for the conduct of documented laboratory procedures involved in synthetic and analytical work, in relation to inorganic systems.**

iii) Transferable skill:-

- **Effectively communicate, to a range of audiences, the principles and outcomes of chemistry research using modern IT applications. This will include the presentation of academic posters, oral presentations, writing concise scientific reports and article abstracts.**
- **Improve your awareness of the practical demands of A level chemistry**

n) Core-XIV (Organic Chemistry)

i) Intellectual skill:-

- **Skills in the evaluation, interpretation and synthesis of chemical information and data**
- **Skills in the practical application of theory using computer software and models**
- **Skills in communicating scientific material and arguments**

ii) Practical skill:-

- **Chemical synthesis, analysis, and problem-solving**

- **Skills required for the conduct of documented laboratory procedures involved in synthetic and analytical work, in relation to both inorganic and organic systems**
- **Conduct standard laboratory procedures involved in synthetic and instrumental work**

iii) Transferable skill:-

- **Communication skills, covering both written and oral communication**
- **Problem-solving skills, relating to qualitative and quantitative information.**
- **Work independently and collaborate effectively with other people in a team**

AIM:

This subject encourage and enable students to become confident to analyze and solve problems in every situations. It develops clear ideas, understand the concept, think reasonably, be optimistic and develop the character through systematic and orderly habits.

OBJECTIVE: some of the objectives of mathematics are:

- 1.Broad and philosophical in nature
- 2.Explain the relationship between Arts, service and productivity.
- 3.Ability to recall or recognize already learnt information
- 4.Ability to select and apply already learnt rules.
- 5.Ability to judge value of materials and methods.

C.C.1.1

SUB: CALCULUS-1

- 1. Intellectual skill: Introduce the mind to the scientific method of analysis.
- 2. Practical skill: The student can plot graphs of every equation in all the three forms i.e cartesian, parametric and polar.
- 3. Transferable skill: The student can teach their juniors, younger brothers and sisters to be more realistic and think reasonably.

C.C.1.2

SUB: ALGEBRA-1

- 1. Intellectual skill: The students can monitor and manipulate information, suppressing unwanted response, disturbing information, flexible thinking and this subject develops concurrent relationship between mathematics and executive function skills.
- 2. Practical skills: The students will develop arithmetic skill about all the four operations i.e addition,substraction,multiplication and division. He/She will have a clear cut idea about the human relationships.
- 3. Transferable skill:
    1. 1. Numerally skill.
    2. 2. Verbal communication.
    3. 3. Written communication.

4. 4. Leadership abilities.
5. 5. Research and analytical skills.

C.C.2.1

SUB: REAL ANALYSIS

- 1. Intellectual skill: The student can analyse problems and can draw inferences. They will know how to form group & how to do group activities.
- 2. Practical skill: The student can plot the second order family of differential equations, different models, and third order differential equations.
- 3. Transferable skill: After getting the knowledge of real analysis they can analyse the real life problems and solve them.

C.C.2.2

SUB: DIFFERENTIAL EQUATION

- 1.Intellectual skill: The student will be aware of different mathematical models and recognise the application of second order differential equations.
- 2.Practical skill: The student can plot different graph and different models.
- 3.Transferable skill: They can apply the application of differential equations for different research activities.

C.C.3.1

SUB: THEORY OF REAL FUNCTIONS

- 1.Intellectual skills: The students will be aware of the limits of every function. They will be more practical and reasonable with the help of this subject. The moral ethics will be developed among students.
- 2.Practical skills: They can sketch the continuous graphs and discontinuous curves on graph papers.
- 3.Transferable skills: The subject knowledge can be applied to interpret different important theorems related to real functions. They will know about the ability of expressions of different functions.

C.C.3.2

SUB: GROUP THEORY

- 1.Intellectual skills: The students will develop
    1. 1.Symmetry skills
    2. 2.Classfying different things
    3. 3.Product of groups etc.
- After getting the subject knowledge the students will develop their optimism, “looking into bright sides’ i.e the beauty of everything that has been created by god.
- 2.Practical skill: The practical skills, those the students will develop are:
    1. a.1.Drawing images correctly
    2. b.2.Drawing relations between different groups
- 3.Transferable skills: after having the knowledge of the subject they will apply the drawing the skills in research work. Compare different things what is right and what is wrong.

C.C.3.3

SUB: PARTIAL DIFFERENTIAL EQUATION AND SYSTEM OF ORDINARY DIFFERENTIAL EQUATIONS

- 1.Intellectual skills: The thinking skill of the students will be developed. The investigating skill will be developed.
- 2.Practical skills: They can plot graphs of wave equations. They can also plot surface of the non-homogeneous system of the equations.
- 3.Transferable skill: After getting the knowledge of the subject the students will apply their knowledge for either research work or solving day to day life problems.

C.C.4.1

SUB: NUMERICAL ANALYSIS

- 1.Intellectual skills: The student will learn how to manipulate ideas, concept and think something new. The creativity will be developed among students.
- 2.Practical skills: The students will know how to write the c programs for N-R method, bisection method, secant method and decomposition method, etc…
- 3.Transferable skills: The students will have a clear cut idea about manipulating data, writting c programs etc…Which will help them in higher studies or research work.

C.C.4.2

SUB: RIEMANN INTEGRATION AND SERIES OF FUNCTIONS

- 1.Intellectual skills: The graphical skills 3-D visualization skills, reasoning skills will be developed.
- 2.Practical skills: The students can draw graph and interpret the important theorems based on continuity and differentiability.
- 3.Transferable skills: The students can get the following transferable skills:

  1.3-D visualization in higher studies

  2.Appearing entrances for higher study.

  3.More reasonable and accountable.

C.C-4.3

SUB: RING THEORY AND LINEAR ALGEBRA

- 1.Intellectual skills: The thinking power and decision making skill will be developed.
- 2.Practical skills: The students can find ranks, nullity, Eigen values, and Eigen vectors with help of matrices.
- 3.Transferable skills: They will use this knowledge in higher education or in their career and also they can use this knowledge for research work.

C.C-5.1

SUB: MULTIVARIATE CALCULUS (CALCULUS-2)

- Intellectual skills: The students can think absolutely, reasonably and out accordingly vectorial representation of qualities will be developed among students.
- Practical skill: Drawing graphs of parametric curves, graphical presentation of important theorems.
- Transferable skills: Double integration over rectangular and non-rectangular region will be thought to the students. The students can use this knowledge to draw inferences and use it in research work or in higher studies.

C.C-5.2

SUB: PROBABILITY AND STATISTICS

- 1.Intellectual skills: It will enhance the confidence label of the students and them to think with probability of happening things. The creativity label will be enhanced.
- 2.Practical skills: They can draw the graphs for normal distribution, Bi-nominal distribution and geometrical distribution graph paper.
- 3.Transferable skills: The students can use the probability concept in higher education. This will surely help them to discover things & help them in research work.

C.C-6.1

SUB: MATRIC SPACES AND COMPLEX ANALYSIS

- 1.Intellectual skills: The logical thinking skill drawing truth tables will help them to decide what is right and what is wrong. They will be more practical.
- 2.Practical skills: The graphical presentation of complex numbers. Analytic function, continuous graphs will be well known by the students.
- 3.Transferable skills: This topic will help the students to understand other subjects like physics, chemistry where there is applications of important theorems.

C.C-6.2

SUB: LINEAR PROGRAMMING

- 1.Intellectual skills: The students will be aware of research models and their utility in day-to-day life. Think logically to solve large problems of mathematics using linear programming methods. They will learn to be more laborious and practical.
- 2.Practical skills: They can draw graphs for graphical solution of LPP. Draw tables for simplex methods etc….
- 3.Transferable skills: They will be more expressible in higher studies, research work and in their day-to-day life.

DEPARTMENT OF PHYSICS
COURSE OUTCOMES

SEMESTER-I

Core-1

- Students will have a sound knowledge of mathematical physics ((Calculus, Vector Calculus, orthogonal curvilinear co-ordinates, vector differentiation and vector integration) and be able to apply this knowledge to analyze a variety of physical phenomena.

- Students will be capable of oral and written scientific communication and will prove that they can think critically and work independently.

Core-2

- Students will have a thorough knowledge of rotational dynamics, non-inertial systems, elasticity, fluid motion, gravitation and central force motion, special theory of relativity and enable them to apply the above knowledge to analyze a variety of physical phenomena.

- Students will be capable of oral and written scientific communication and will prove that they can think critically and work independently.

PHYSICS LAB C-I

- Students will have a good laboratory skills, enabling them to take observations and measurements in a physics laboratory and analyze the results to draw valid conclusions.

- Students will learn the use of operating system Linux or Microsoft windows to solve problems relating to physics.

LAB C-II

- Students will have a thorough laboratory skills, enabling them to take observations and measurements in a physics laboratory and analyze the results to draw valid conclusions.

SEMESTER- II

C-3

- Students will have a sound knowledge of Electric Field and Potential, Magnetic field, Electrical circuits and be able to apply this knowledge to analyze a variety of physical phenomena.

- Students will be capable of written scientific communication and will prove that they can think critically and work independently.

C-4

- Students will have a thorough knowledge about Geometrical optics, wave optics, wave motion, interference, diffraction etc. and be able to apply the above knowledge to analyze various aspects of a physical phenomena.

PHYSICS LAB C-III

- Students will have a good laboratory skills, enabling them to take observations and measurements in a physics laboratory and analyze the results to draw valid conclusions.

PHYSICS LAB C-IV

- Students will develop a good laboratory skills, which help them to take observations and analyze the results to draw conclusions.

SEMESTER-III

C-5

- Students will have a sound knowledge in mathematical physics (Fourier series, Frobenius method, Special Functions, Some special Integrals, Partial differential equations) and be able to apply this knowledge for a proper understanding of physics.

C-6

- Students will have a thorough knowledge of Thermal physics and be able to study of different physical phenomena.

PHYSICS LAB-C-V

- Students will have a good knowledge of computer programming and numerical analysis but to emphasize its role in solving problems in physics.

LAB-C-VI

- Students will have a good laboratory skills which will help them to take observations and measurements in a physics laboratory and to draw valid conclusions.

C-7

- Students will have a sound knowledge of Digital system and applications, and be able to apply this knowledge to analyze a variety of physical phenomena.

LAB-C-VII

- Students will have a thorough laboratory skills enabling them to take observations and measurements in a physics laboratory and to analyze its results.

SEMESTER-IV

C-8

- Students will have proficiency in mathematical physics (Complex analysis, Integral transform, Laplace transform) and the mathematical concepts needed for a proper understanding of physics.

C-9

- Students will have a good knowledge of modern physics, nuclear physics and be able to apply this knowledge to analyze a variety of physical phenomena.

- Students will be capable of oral and written scientific communication and will prove that they can think critically and work independently.

C-10

- Students will have a sound knowledge of analog systems and its applications, which will help them to analyze different physical phenomena.

PHYSICS LAB- C-VIII

- Students will develop computing skills relating to Scilab based simulations experiments based on mathematical physics.

PHYSICS LAB -C-IX

- Students will have a thorough laboratory skills, enabling them to take observations in a laboratory and to draw conclusions.

LAB-C-X

- Students will have a good laboratory skills, enabling them to take observations and measurements in a physics laboratory and analyze the results to draw valid conclusions.

SEMESTER-V

C-11

- Students will have a thorough knowledge of quantum mechanics and its applications, and be able to apply the knowledge to analyze different physical problems.

- It is helpful for students to develop oral and written scientific communication relating to physics.

C-12

- Students will have a sound knowledge of solid state physics and be able to apply this knowledge to analyze a variety of physical phenomena.

C-13

- Students will have a good knowledge of electromagnetic theory and be able to apply this knowledge to analyze different problems relating to physics.

C-14

- Students will have a thorough knowledge of statistical mechanics and be able to apply this knowledge to analyze a variety of physical phenomena.

PHYSICS LAB-C-XI

- Students will have a sound knowledge on C/C++/Scilab for solving various problems based on Quantum mechanics.

LAB-C-XII

- Students will have a good laboratory skills which will help them to take observations and measurements in a physics laboratory and to draw valid conclusions.

LAB-C-XIII

- Students will have a thorough laboratory skills enabling them to take observations and to analyze its results and to draw valid conclusions.

C-15

- Students will have a good knowledge of statistical mechanics and be able to study and analyze a variety of physical phenomena.

DEPARTMENT OF PHYSICS

PROGRAMME OUTCOMES

1. Students are expected to acquire a core knowledge in physics, including the major premises of mathematical physics, classical mechanics, quantum mechanics, electromagnetic theory, electronics, optics, special theory of relativity and modern physics.

2. Students are also expected to develop a written and oral communication skills in communicating physics related topics.

3. Students would be able to learn how to design and conduct an experiment (or series of experiments) demonstrating their understanding of the scientific method and processes. They are expected to have an understanding of the analytical methods required to interpret and analyze results and draw conclusions as supported by their data.

4. Students will develop the proficiency in the acquisition of data using a variety of laboratory instruments and in the analysis and interpretation of such data.

5. Students will realize and develop an understanding of the impact of physics and science on society.

6. Students can apply conceptual understanding of the physics to general real-world situations.

7. Students will have to describe the methodology of science and the relationship between observation and theory.

8. Students will have to discover the different concepts of physics relating to other disciplines such as mathematics, computer science, engineering and chemistry.

9. Students will have to analyze the various physical problems and develop correct solutions using natural laws.

10. Students can appear different competitive examinations like IAS, IPS, Indian Forest Service, OAS and some defence services taking physics as a major subject and can score good marks in physics.

11. After completion of this programme students can join masters' programme in physics or applied physics by qualifying the entrance examinations for these programmes of different universities and technical institutions of India.

PSO's of B.Sc. Zoology

PSO 1 : Analyse the general characters, classification and evolutionary significance of non-chordates (Protista to pseudocoelomates).

PSO 2 : Understand the basic concepts of ecology, its components and biostatistics.

PSO 3 : Analysis the general characters, classification and evolutionary significance of coelomate non chordates.

PSO 4 : Understand the structural organization, histology, functions and mechanism of the life sustaining systems.

PSO 5 : Understand the origin, distribution, classification, characters and special features of all chordates starting from most primitive forms (protochordates) to the most advanced forms (mammals).

PSO 6 : understand the structure, histology and functioning of the controlling and co-ordinating systems.

PSO 7: Analyse the relationship between different vertebrate groups with respect to the anatomy of different systems.

PSO 8: Understand the biochemistry and various metabolic processes associated with organic compounds.

PSO 9 : Understand the structure and functions of various cellular organelles.

PSO 10 : Understand the concepts of Mendelian genetics, chromosomal mapping, mutations controlling our systems, mechanism of sex determination, extra chromosomal inheritance.

PSO 11 : Understand the different aspects of animal development at different embryonic stages and application of these concepts in modern fields of research biology.

PSO 12: Understand the structure of DNA, DNA replication, transcription, translation and regulatory factors controlling the above processes.

PSO 13 : Understand the basic concepts of human defense mechanism, the cells/organs and their secretions involved in the different immunological responses and the application of these concepts in modern biotechnology.

PSO 14 : Analyse the evolution of different forms of life and the forces controlling them.

Course outcomes

Core-1

Diversity and Evolution of Non-chordata (Protista to Pseudocoelomates).

CO 1 : Discuss about the general characteristics, classification upto classes, locomotion and reproduction in Protista. Give an account of life cycle, pathogenicity and prophylaxis of *Plasmodium vivax*, *Trypanosoma gambiens* and *Entamoeba histolytica.*

CO 2 : Describe the general characters and classification upto classes of phylum porifera and ctenophore. Give an account of canal system in sponges. Discuss about the general characters and evolutionary significance of parazoa and metazoa.

CO 3 : Discuss about the general characteristics and classification upto classes of phylum cnidarian, corals and coral reefs.

CO 4 : Give an account of the general characteristics and classification upto classes of phylum Platyhelminthes. Describe the life cycle, pathogenicity and prophylaxis along with parasitic adaptation of *Fasciola hepatica* and *Taeniasolium*.

CO 5 : Describe the general characteristics and classification upto classes of phylum nemathelminthes. Discuss about the life cycle, pathogenicity, prophylaxis and parasitic adaptation of *Ascarislumbricoides* and *Wuschereriabancrofti*.

Core-2

Perspective in Ecology and Biostatistics.

CO 1 : Write the relevance of studying ecology. Briefly describe the history of ecology. Discuss the laws of limiting factors. Describe light and temperature as ecological factors along with their effects. Write notes on food chain, food web, energy flow through the ecosystem and ecological pyramids.

CO 2 : Describe the characteristics of population. Give an account of different patterns of population growth. Discuss about population regulation and population interactions. Discuss Gause' Principle. Write a note on Lotka-Volterra equation for competition and predation.

CO 3 : Discuss the different characteristics of community. Write notes on ecotone and edge effect. Discuss ecosystem development (succession) with examples. Give an account of the theories pertaining to climax community. Write notes on nutrient and biogeochemical cycles.

CO 4 : Give an account of the different types of biodiversity and their significance. Discuss about causes of loss of biodiversity. Describe in detail about the different types of conservation strategies. Write note on endangered species concept. Discuss the role of ZSI, WWF, IUCN, Wildlife (protection) Act. 1972.

CO 5 : What is biostatistics. Discuss its concept and scopes. Discuss the measures of central tendency. Describe the measures of dispersion with relation to standard deviation. Write notes on Chi-square test, T test and Z test. Explain the analysis of correlation and regression. Write on data analysis using EXCEL programme.

Core-3

Diversity and Evolution of Non chordates (Coelomate Non chordates)

CO 1 : Describe the general characteristics and classification upto classes of phylum Annelida. Write notes on coelom, metamerism and excretion in Annelidas.

CO 2 : Write down the general characteristics and classification upto the classes of phylum Arthropoda. Discuss about vision and respiration in Arthropodas. Write notes on moulting, metamorphosis and social life in insects. Give an account of larval forms of crustacea.

CO 3 : Describe the general characteristics and evolutionary significance including affinities of peripatus.

CO 4 : Give an account of general characters and classification upto classes of phylum Mollusca. Describe respiration, torton and detorton in Mollusca. Write notes on pearl formation in bivalves and evolutionary significance of trochophore larva.

CO 5 :Discuss about the general characteristics and classification upto classes of phylum Echinodermata. Write notes on larval forms and evolutionary significance of Echinodermata. Give an account of water vascular system in Asteroids i.e. starfish.

Core-4

Physiology- life Sustaining Systems.

CO 1 : Describe the structural organization, histology and functions of alimentary canal and its associated glands. Discuss about the physiology of digestion and absorption of food.

CO 2 : Write down the histology of the respiratory organs and the mechanisms of respiration.

CO 3 : Discuss about the structure of the kidney and the mechanism of urine formation and its regulation.

CO 4 : Describe the composition and functions of blood. Write a note on the mechanism of blood coagulation and blood related disorders.

CO 5 : Discuss about the structure of the heart, coronary circulation, conduction of cardiac impulse, cardiac cycle. Write a note on nervous and chemical regulation of heart beat.

Core-5

Diversity and Distribution of Chordata.

CO 1 : Discuss about the different theories related to origin of phylum Chordata. Describe the different characteristics of the three different classes of subphylum Protochordata. Write notes on the larval forms of protochordates and retrogressive metamorphosis in Urochordata.

CO 2 : Give an account of the advanced features of vertebrates over protochordates. Identify the general characteristics and classification of Cyclostomes upto class. Write notes on the structural peculiarities and affinities of *Petromyzon* and *Myxine.*

CO 3 : Describe the general characteristics and classification of chondrichthyes, osteichthyes and Amphibia upto orders. Write notes on the types of parental care in fishes and amphibians. Discuss on migration, osmoregulation and scales of fishes. Write a note on origin of tetrapoda.

CO 4 : Identify the general characteristics and classification of clasessReptilia and Aves upto orders. Write a note on skull in Reptiles, affinities of *Sphenodon*, poison apparatus and biting mechanism in snakes. Give an account of principles and aerodynamics of flight, flight adaptations and migration in birds. Write a note on *Archaeopteryx* as a connecting link.

CO 5 : Discuss the general characteristics and classification of mammals upto orders. Write notes on affinities of Prototheria and Metatheria, dentition in mammals. Discuss about the adaptive radiation in mammals with reference to locomotory appendages. Givean account of the zoological realms and theories pertaining to the distribution of animals in different realms.

Core-6

Physiology- Controlling and Coordinating Systems.

CO 1 : Study the structure, location, functions and types of different tissues.

CO 2 : Discuss about the structure of neuron, mechanism of transmission of nerve impulse. Write a reflex action and its mechanism. Describe the physiology of hearing and vision.

CO 3 : Describe the histology of different types of muscles, mechanism of muscle contraction and characteristics of muscle.

CO 4 : Discuss about the histology and physiology of male and female reproductive systems. Write a note on methods of contraception.

CO 5 : Describe the histology of different endocrine glands, the hormones secreted by them, their functions and disorders.

Core-7

Comparative Anatomy of Vertebrates.

CO 1 : Describe the structure, functions and derivatives of integumentary system. Give a comparative account of the axial and appendicular skeleton in different vertebrates. Give an account of jaw suspensorium in vertebrates.

CO 2 : Give a comparative account of alimentary canal and associated glands in different groups of vertebrates. Describe skin, gills, lungs and air sacs as respiratory organs in different vertebrates. Write a note on accessory respiratory organs in fishes.

CO 3 : Write a note on general plan of circulation in vertebrates. Give an account of the comparative anatomy of heart in different group of vertebrates. Add a note on its evolution. Discuss about the evolution of aortic arches in vertebrates.

CO 4 : Write a note on succession of kidney in vertebrates. Explain the evolution of urinogenital ducts in different vertebrates.

CO 5 : Give a comparative account of brain in different vertebrates. Write notes on autonomic nervous system, spinal cord, spinal nerves and cranial nerves in mammals. Classify the different types of receptors found in vertebrates.

Core-8

Biochemistry and Metabolic Processes.

Co 1 : Describe the structure and properties of carbohydrates, lipids and proteins.

Co 2 : Discuss about cellular respiration, Glycolysis, Krebs cycle, Pentos phosphate pathway, Gluconeogenesis, Glycogenolysis and Glycogenesis.

Co 3 : Write notes on β-oxidation of fatty acids.

Co 4 : Describe protein metabolism.

Co 5 : Describe about the kinetics and mechanism of enzyme action. Write a note on electron transport chain.

Core-9

Cell Biology.

CO 1 : Differentiate between prokaryotic and eukaryotic cells. Write notes on mycoplasma, virus, viroid, virisions and prions. Describe the various models of plasma membrane. Describe the mechanism of transportation across membrane. Give an account of the structure and functions of different types of cell junction.

CO 2 : Give an account of the structure, functions and semiautonomous nature of mitochondria. Describe the structure and functions of the endoplasmic reticulum. Describe about the structure and functions of the Golgi apparatus. Write down the structure and functions of the lysosomes. Write notes on mechanism of vesicular transport, chemiosmotic hypothesis, endosymbiotic hypothesis and peroxisomes.

CO 3 : Give an account of the structure and functions of different types of cytoskeleton . describe the ultrastructure and functions of nucleus. Discuss about the structure and functions of nucleolus. Write notes on nuclear envelope, structure of nuclear pore complex, chromosomal DNA and its packaging.

CO 4 : Describe cell cycle and its regulation. Discuss about signaling molecules and their receptors.

CO 5 : What is apoptosis. Discuss about its extrinsic and intrinsic pathways. Discuss about the growth and development of tumors and metastasis.

Core-10

Principles of Genetics.

CO 1 : Write the principles of inheritance including sex-linked inheritance. Discuss about incomplete dominance and co-dominance. Describe multiple alleles and lethal alleles. Give an account of epistasis and pleiotrophy.

CO 2 : Discuss the different types and mechanisms of linkage. Give an account of the types and molecular mechanisms of crossing over. Describe the different types of hybridization.

CO 3 : Describe the molecular basis of mutation and its types. Write down the different methods of detection of mutations. Give an account of the DNA repair mechanisms.

CO 4 : Write down the chromosomal methods of sex determination. Describe the sex-linked influenced and sex linked characters. Give an account of the roles of polygenic inheritance and transgressive variations in evolution.

CO 5 : Give an account of the criteria for extra chromosomal inheritance. Discuss the antibiotic resistance in *Chlamydomonous*. Describe mitochondrial mutations and maternal effects.

Core-11

Developmental Biology.

CO 1 : Discuss about the history and basic concepts of developmental biology. Give an account of the different types of cell-cell interaction, patterns of formation, differentiation and growth, gene expression, cytoplasmic determinants and asymmetric cell division.

CO 2 : Discuss the process of spermatogenesis and oogenesis. Give an account of the different types of egg and egg membranes. Describe the mechanism of fertilization, changes in the gametes involved in the process and incidence of monospermy and polyspermy. Discuss about the planes and patterns of the cleavage. Describe the early development of frog and chick upto gastrulation. Give an account of the different types of the fatemaps. Discuss the concept of embryonic induction. Describe the organizer concept.

CO 3 : Discuss about the fate of different embryonic germ layers. Give an account of the extra embryonic membranes in bird. Discuss about the implantation of embryo in human. Describe the structure, types and functions of placenta.

CO 4 : Give an account of the changes and hormonal regulation of metamorphosis in amphibians. Describe the different modes of regeneration. Discuss the concept and models of aging.

CO 5 : What is teratogenesis. Discuss its causative agents and their effects on embryonic development. Discuss about in vitro fertilization, stem cell culture and amniocentesis.

Core-12

Molecular Biology.

CO 1 : Describe the history and structure of DNA. Discuss the structure of RNA and its types. Give an account of the DNA replication in prokaryotes and eukaryotes and its types.

CO 2 : Describe the mechanism of transcription in eukaryotes and prokaryotes and factors regulating transcription. Give an account of the synthesis of rRNA and mRNA.

CO 3 : Give an account of the genetic code and Wobble hypothesis. Describe the process of protein synthesis in prokaryotes. Give an account of the structure of ribosome. Discuss the difference between prokaryotic and eukaryotic translation.

CO 4 : Describe the structure of globin mRNA. Discuss the splicing mechanism. Give an account of exon shuffling and RNA editing.

CO 5 : Give an account of transcription in eukaryotes and its regulation. Discuss gene silencing and genetic imprinting. Describe RNA interference miRNA and siRNA.

Core-13

Immunology.

CO 1 : Give an account of the histological perspective and early theories of immunology. Discuss the different types of immune responses and cells/organs associated with these responses. Discuss the different types of dysfunctions of immune system.

CO 2 : Discuss the different properties of immunogens and the factors influencing the immunogenicity. Write notes on adjuvents, haptens and epitopes.

CO 3 : Give an account of the structure and functions of different classes of immunoglobulins. Discuss the antigen-antibody interaction. Write notes on immunoassay, polyclonal sera, monoclonal antibodies and hybridoma technology.

CO 4 : Discuss the structure and functions of exogenous and endogenous pathways of antigen presentation. Discuss the components and pathways of complement activation.

CO 5 : Discuss the properties and functions of cytokines in addition to cytokine based therapies. Discuss the different types of hypersensitivities as per Gell and Coomb classification. Discuss the different types of vaccines in addition to DNA vaccines and recombinant vaccines.

Core-14

Evolutionary Biology.

CO 1 : Describe different theories on origin of life. Discuss the major events in history of life. Give an account of five major extinctions and their background. Adding a note on role of extinction in evolution.

CO 2 : Discuss about the different evidences of evolution with examples. Write a note on types of fossils and the process of dating of fossils based on molecular clock concept. Give an account of phylogeny of horse and human.

CO 3 : Write a note on the roles of different types and factors of natural selection in the process of evolutionary change. Give an account of the sexual selection and artificial selection contributing to the process of evolution. Discuss the roles of variations and isolations in evolution.

CO 4 : Give an account of gene frequencies and shifts in gene frequencies with and without selection. Write a note on Hardy-Weinberg equilibrium. Discuss gene pool, gene flow and genetic drift.

CO 5 : Describe different species concepts along with their advantages and limitations. Give an account of modes of speciation. Write a note on macro evolutionary principles of evolution in relation to Darwin's Finches. Explain convergence, divergence and parallelism.