

**PROGRAMME OUTCOME (PO)**  
**PROGRAMME SPECIFIC OUTCOME (PSO)**  
**&**  
**COURSE OUTCOME(CO)**  
**FOR**  
**UNDER GRADUATE COURSES**



**Internal Quality Assurance Cell**  
**SALIPUR AUTONOMOUS COLLEGE, SALIPUR**  
**Dist. Cuttack, Odisha**

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# SALIPUR AUTONOMOUS COLLEGE, SALIPUR

CUTTACK, Odisha-754202

## PROGRAM OUTCOMES(POs), PROGRAM SPECIFIC OUTCOMES(PSO) AND COURSE OUTCOMES(COs)

### Arts Faculty

#### 1. ECONOMICS:

##### A) PROGRAM OUTCOMES

<b>PO1.</b>	Economics subject enables the learners to build up a professional carrier as economists, financial advisors, economics planners and policy makers.
<b>PO2.</b>	It prepares them to cope up with the stress and strain involved in the process of economic development.
<b>PO3.</b>	Department supports the education and training of students, teachers and research in economics

##### B) PROGRAM SPECIFIC OUTCOMES

<b>PSO1.</b>	The behavioural patterns of different economic agents, advance theoretical issues and their applications.
<b>PSO2.</b>	Macroeconomics
<b>PSO3.</b>	Understand the basic concept of microeconomics.
<b>PSO4.</b>	Acquaint with some basic statistical methods to be applied in economics.
<b>PSO5.</b>	Acquaint with some basic mathematical methods to be applied in economics.
<b>PSO6.</b>	Acquaint with some basic theoretical concept of public finance.
<b>PSO7.</b>	Acquaint with the measurement of development with the help of theories along with the conceptual issues of poverty and inequalities with Indian perspectives.
<b>PSO8.</b>	Delineate the fiscal policies designed for developed and developing economics.
<b>PSO9.</b>	Facilitate the historical developments in the economic thoughts propounded by different schools.
<b>PSO10.</b>	Learn the basic concept of monetary analysis and financial marketing in Indian financial markets.
<b>PSO11.</b>	Learn the development issues of Indian economy.
<b>PSO12.</b>	Acquaint with some basic concept of environmental economics along with the solution of the environmental problems.
<b>PSO13.</b>	Learn the real and monetary sides of International economics.
<b>PSO14.</b>	Acquaint with the characteristics of the economy of Odisha.

## **B) COURSE OUTCOMES**

### **SEMESTER –I**

#### **Core – I (INTRODUCTORY MICROECONOMICS)**

<b>CO1</b>	After completion of the course, the students shall be able to explore the subject matter of Economics
<b>CO2</b>	To know supply and demand: How market works, markets and welfare
<b>CO3</b>	This course will enable the households- The budget constraint
<b>CO4</b>	The firm and market structures
<b>CO5</b>	The input markets- The demand for labour.

#### **Core – II (MATHEMATICAL METHODS FOR ECONOMICS – I)**

<b>CO1</b>	This course will enable students to know more about Set and set operations.
<b>CO2</b>	Elements of matrix algebra and input output analysis.
<b>CO3</b>	Differential calculus and its economic applications.
<b>CO4</b>	Integral calculus and its economic applications.
<b>CO5</b>	Use of differential and difference equations in economics.

### **SEMESTER – II**

#### **Core – III (INTRODUCTORY MACRO ECONOMICS)**

<b>CO1</b>	After completion of this paper, the students will be able to know basic concepts of macro economics.
<b>CO2</b>	Measurement of macroeconomic values
<b>CO3</b>	To know about Money – Evolution and function, cash transaction, cash balances, etc.
<b>CO4</b>	Knowledge about Inflation, Deflation, Depression and Stagflation
<b>CO5</b>	Determination of National income

#### **Core – IV (MATHEMATICAL METHODS FOR ECONOMICS – II)**

<b>CO1</b>	To know about Linear Models.
<b>CO2</b>	Second and higher order derivatives.
<b>CO3</b>	Differentials and total derivatives.
<b>CO4</b>	Single and multivariable optimisation.
<b>CO5</b>	Optimisation with Equality constraints.

### **SEMESTER – III**

#### **Core – V (MICROECONOMICS – I)**

<b>CO1</b>	After completion of the course, the students shall be able to know the Basic concepts of microeconomics such as laws of demand and supply and elasticity etc.
<b>CO2</b>	Concepts of consumer behaviour like cardinal utility and ordinal utility analysis.
<b>CO3</b>	Application of Indifference curve analysis in deriving demand curves, price effect, income effect and substitution effect.
<b>CO4</b>	Theory of production- iso-quants, laws of returns to scale, law of variable proportion.
<b>CO5</b>	Traditional and modern theory of cost.

**Core – VI (MACROECONOMICS – I)**

<b>CO1</b>	The students will be able to know the Theories of Consumption Function.
<b>CO2</b>	Theories of Investment Function.
<b>CO3</b>	Demand for and supply of money.
<b>CO4</b>	Aggregate Demand and Aggregate Supply.
<b>CO5</b>	Inflation, unemployment, expectations and trade cycles.

**Core – VII (STATISTICAL METHODS FOR ECONOMICS)**

<b>CO1</b>	Basic concepts of statistics such as measures of central tendency, dispersion, skewness and kurtosis.
<b>CO2</b>	Elementary probability theory including probability distributions.
<b>CO3</b>	Methods of sampling and census.
<b>CO4</b>	Correlation and simple regression
<b>CO5</b>	Index numbers.

**SEMESTER – IV**

**Core – VIII (MICROECONOMICS – II)**

<b>CO1</b>	To analyse the behavioural patterns of different economic agents regarding profit, price, cost etc.
<b>CO2</b>	The decision making process in different market situations such as perfect competition, monopolistic competition, monopoly and oligopoly markets.
<b>CO3</b>	To deal with the advance theoretical issues and their practical applications of distribution theories.
<b>CO4</b>	General equilibrium, economic efficiency and market failure.

**Core – IX (MACROECONOMICS – II)**

<b>CO1</b>	This course will help students understand financial markets and reforms.
<b>CO2</b>	Open economy macroeconomics.
<b>CO3</b>	Modelling economic growth.
<b>CO4</b>	Macroeconomic policy.
<b>CO5</b>	Schools of macroeconomic thought and the fundamentals of macroeconomic theory and policy.

#### **Core – X (PUBLIC ECONOMICS)**

<b>CO1</b>	This course will enable students to understand introduction to public finance.
<b>CO2</b>	Public expenditure.
<b>CO3</b>	Public revenue.
<b>CO4</b>	Public budget.
<b>CO5</b>	Public debt.

#### **SEMESTER – V**

#### **Core – XI (INDIAN ECONOMY – I)**

<b>CO1</b>	After completion of this course, the students shall be able to have knowledge of basic characteristics of Indian economy as a developing economy.
<b>CO2</b>	Population and economic development.
<b>CO3</b>	National Income in India - The growth story and Regional disparities.
<b>CO4</b>	Economic planning in India
<b>CO5</b>	Current challenges.

#### **Core – XII (DEVELOPMENT ECONOMICS – I)**

<b>CO1</b>	The students shall be able to have knowledge of economic development.
<b>CO2</b>	Theories of economic growth and development.
<b>CO3</b>	Poverty, inequality and development.
<b>CO4</b>	Institutions and economic development.
<b>CO5</b>	Agriculture, industry and economic development.

#### **DSE – I (ECONOMIC HISTORY OF INDIA)**

<b>CO1</b>	This course will enable the students to know about Colonial India: Background and introduction.
<b>CO2</b>	Macro trends- National income, population and occupational structure.
<b>CO3</b>	Agriculture - Agrarian structure and land relations.
<b>CO4</b>	Railways and industry - De-industrialisation debate, evolution of entrepreneurial and industrial structure.
<b>CO5</b>	Economy and state in the imperial context.

## DSE – II (INTRODUCTORY ECONOMETRICS)

<b>CO1</b>	After completion of this course, the students will know about Introduction of Econometrics - Nature and scope, probability distributions and their uses.
<b>CO2</b>	Sampling - Basic concepts, probability and non-probability sampling, types and estimation
<b>CO3</b>	Hypothesis testing - defining statistical , simple, composite, null and alternative hypothesis and errors.
<b>CO4</b>	Linear regression analysis.
<b>CO5</b>	Violation of classical assumptions.

## SEMESTER VI

### Core – XIII (INDIAN ECONOMY – II)

<b>CO1</b>	Once the course is completed, the students shall have an idea about Agricultural development in India.
<b>CO2</b>	Industrial development in India.
<b>CO3</b>	Tertiary sector and HRD.
<b>CO4</b>	External sector- Foreign trade, export and import, balance of payment, trade policies, and foreign capital.
<b>CO5</b>	Indian economy and environment -Environmental Policies, rules, National Forest policy, Policy statement for abatement of pollution, National conservation strategy, etc.

### Core – XIV (DEVELOPMENT ECONOMICS – II)

<b>CO1</b>	This course will enable students to know about Population and development - Demographic concepts, costs and benefits of population growth etc.
<b>CO2</b>	Dualism and economic development - Geographic, social and technological, regional inequalities, international inequality, dependency, exploitation and unequal exchange.
<b>CO3</b>	Environment and development.
<b>CO4</b>	Financing economic development.
<b>CO5</b>	Globalisation, international trade and economic development.

## DSE – III (INTERNATIONAL ECONOMICS)

<b>CO1</b>	Having completed this course, the students should know the Importance of trade and trade theories.
<b>CO2</b>	Trade and economic growth.

<b>CO3</b>	Exchange rate.
<b>CO4</b>	Balance of trade and payments
<b>CO5</b>	International economic institutions.

## 2. EDUCATION

### A) PROGRAM OUTCOMES

<b>PO1</b>	After graduation Education helps in realization of human values and sense of social service .
<b>PO2</b>	Graduates in Education will be responsible and dutiful citizen having critical temper and creative ability.
<b>PO3</b>	Promotes teaching ability to young and adults alike.
<b>PO4</b>	The course generates employability in primary and secondary levels.
<b>PO5</b>	Provides scope for higher studies and research in Education.

### B) PROGRAM SPECIFIC OUTCOMES

<b>PSO1</b>	Understand basic concepts and ideas of educational theory.
<b>PSO2</b>	Build understanding and perspective on the nature of the learner, diversity and learning.
<b>PSO3</b>	Comprehend the role of the systems of governance and structural – functional provisions that support school education.
<b>PSO4</b>	Develop understanding about teaching, pedagogy, school management and community involvement.
<b>PSO5</b>	Build skills and abilities of communication, reflection, art, aesthetics, theatre, self expression and ICT.

### C) COURSE OUTCOMES SEMESTER – I

#### Core – I (BASICS IN EDUCATION)

<b>CO1</b>	After completion of the paper, students shall be able to explain the concept of education and its relationship with philosophy.
<b>CO2</b>	Bases of Education - Meaning, nature and purpose of Education. Aims and functions.
<b>CO3</b>	Reflections of Indian schools of Philosophy on Education.
<b>CO4</b>	Western schools of Philosophy and their Educational implications.
<b>CO5</b>	Doctrines of Great Educators of East and West and their influence on the practices of school Education with special reference to aims and ideals of



	Education, curriculum, method of teaching and the role of teacher.
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**Core – II (EDUCATION AND SOCIETY)**

<b>CO1</b>	After completion of this paper, students shall be able to justify Education as a process and explain its function.
<b>CO2</b>	They shall be able to describe the aims of education from sociological perspective.
<b>CO3</b>	The students will be competent to list various agencies of Education and their functions.
<b>CO4</b>	They can justify Education as a sub-system of society and how other sub-systems affect Education.
<b>CO5</b>	After this paper the students will be able to appreciate the importance of Education for social change.

**SEMESTER – II**

**Core – III (THE LEARNER AND LEARNING PROCESS)**

<b>CO1</b>	After completion of this paper, the students shall be able to establish relationship between Education and Psychology.
<b>CO2</b>	They shall understand various methods used to study individual behaviour.
<b>CO3</b>	The students will be able to explain the application of Education Psychology in teaching learning process.
<b>CO4</b>	Understanding individual difference from intelligence, creativity and personality point of view and explain the concept of learning and factors affecting learning.
<b>CO5</b>	They shall be able to reflect the contribution of various learning theories in teaching learning process and explain different category of people from different personality type and the type of adjustment.

**Core – IV (PEDAGOGICAL SKILLS)**

<b>CO1</b>	After completion of this course, the students shall be able to explain the concept of pedagogy.
<b>CO2</b>	They shall be able to differentiate pedagogy from other allied concepts.
<b>CO3</b>	They will be able to define type of task of teaching.
<b>CO4</b>	Establish relationship between teaching and learning.
<b>CO5</b>	In addition, they shall be able to list out different approaches and methods of teaching.

**SEMESTER – III**

**Core – V (TECHNOLOGY AND INNOVATIONS IN EDUCATION)**

<b>CO1</b>	On completion of this course, the students will be able to understand the meaning, nature and scope of Educational Technology.
<b>CO2</b>	The will be able to explain with examples various approaches to Educational Technology.
<b>CO3</b>	They shall describe systems approach and its application in Educational context.

<b>CO4</b>	The students will be capable of explaining the concepts, principles, modes, process and barriers of communication and their implications in Educational context.
<b>CO5</b>	They shall be able to explain the instructional design and its underlying principles and describe different models of teaching and their use in effective classroom teaching.

**CORE – VI (PEDAGOGY OF SCHOOL SUBJECTS)**

<b>CO1</b>	On completion of this paper, the students shall be able to explain the meaning and scope of History and relate History with other school subjects.
<b>CO2</b>	They will be able to explain the different approaches to organization of contents in History.
<b>CO3</b>	Achieve mastery over different methods and approaches for curriculum transaction.
<b>CO4</b>	List out the different types of teaching learning materials in history and explain their importance.
<b>CO5</b>	This paper will enable them to prepare lesson plan in History.

**Core – VII (STATISTICS IN EDUCATION)**

<b>CO1</b>	This paper will enable students to describe the importance of statistics in field of Education.
<b>CO2</b>	After completion of this course the students will be able to convey the essential characteristics of a set of data by representing in tabular and graphical forms.
<b>CO3</b>	Compute relevant measures of average and measures of variation.
<b>CO4</b>	The can spell out the characteristics of normal probability of distribution.
<b>CO5</b>	Examine relationship between and among different types of variables of a research study.

**SEMESTER – IV**

**Core – VIII (CURRICULUM DEVELOPMENT & EDUCATIONAL GUIDANCE)**

<b>CO1</b>	On completion of this paper, the students shall be able to define and explain the concept of curriculum.
<b>CO2</b>	They can list different types of curriculum with examples and suggest bases of curriculum such as, Philosophical, Psychological and Sociological.
<b>CO3</b>	Describe different considerations for curriculum planning and elucidate different process of curriculum development.
<b>CO4</b>	They shall be able to explain the role of teacher in curriculum development and identify major issues and trends in curriculum.
<b>CO5</b>	Explain National Curriculum Framework (2005), explain different types of guidance & counselling along with listing out different type of counselling services and the role of teacher in organising those services.

**Core – IX (EDUCATIONAL ASSESSMENT & EVALUATION)**

<b>CO1</b>	After studying the course the students shall be able to describe the role of assessment in Education and differentiate measurement, assessment and evaluation.
<b>CO2</b>	Establish the relationship among measurement, assessment and

	evaluation and to explain different forms of assessment that aid student learning.
<b>CO3</b>	Use wide range of assessment tools and techniques and construct these appropriately.
<b>CO4</b>	Classify educational objectives in terms of specific behavioural form and prepare a good achievement test on any school subject.
<b>CO5</b>	Explain the characteristics of good measuring instruments and list out different type of assessment techniques.

**Core – X (INTRODUCTION TO EDUCATIONAL RESEARCH)**

<b>CO1</b>	On completion of this course the students shall be able to describe the nature, purpose, scope of research in Education.
<b>CO2</b>	Identify types of research in Education and explain the characteristic of qualitative, quantitative and mixed research.
<b>CO3</b>	Select and explain an appropriate method for a research study.
<b>CO4</b>	Select appropriate tools and techniques for the collection of data.
<b>CO5</b>	Describe the procedure of preparation of Research Report.

**SEMESTER – V**

**Core – XI (HISTORY OF EDUCATION IN INDIA)**

<b>CO1</b>	This course will enable students to narrate the concept of Education in the context of Indian heritage.
<b>CO2</b>	Describe Education in ancient India, particularly, Vedic Education, panishadic Education and the Buddhist Education.
<b>CO3</b>	Critically examine the Education system in Medieval India .
<b>CO4</b>	Elaborate the role of teacher, school and community in preservation of Indian heritage and achievement of National goals.
<b>CO5</b>	Evaluate the Education system during British period with special emphasis on the commissions and committees. Elaborate the status of Education during post-independence period with special emphasis on the commissions and committees.

**Core – XII (COMPARATIVE EDUCATION)**

<b>CO1</b>	Students shall be able to explain the scope of comparative Education.
<b>CO2</b>	List out the factors of comparative Education.
<b>CO3</b>	Compare the structure, curriculum and evaluation system of India with that of China, Japan, U.K and U.S.A.

**DSE – I (ICT IN EDUCATION)**

<b>CO1</b>	Once the course is completed, the students shall be able to explain the concept, nature and scope of ICT in Education.
<b>CO2</b>	Differentiate Web 1.0 and Web 2.0 and describe the importance of open source software in Education.
<b>CO3</b>	List and explain various approaches in adoption and use of ICT in Education and various stages of ICT usages in general and pedagogical usages in particular .
<b>CO4</b>	Describe the needed teacher competencies for ICT usage in the classroom.

<b>CO5</b>	Demonstrate the use of various computer software such as Word-processing, Spreadsheets and Presentation.
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### **DSE – II (SPECIAL EDUCATION)**

<b>CO1</b>	On completion of the course, the students shall be able to know about the concept, nature, objectives, types and historical perspective of special Education.
<b>CO2</b>	Explain the innovations and issues of special Education.
<b>CO3</b>	Elaborate the policies and programmes of special Education.
<b>CO4</b>	Able to identify different type of special category children and understand various Educational interventions meant for special children.
<b>CO5</b>	Explain the role of resource teacher and special teacher.

### **SEMESTER – VI**

### **Core – XIII (EDUCATIONAL PLANNING, ADMINISTRATION AND MANAGEMENT)**

<b>CO1</b>	After completing the course, the students will be able to explain the concept, nature, scope and principles of Educational management.
<b>CO2</b>	Describe the functions of Educational management and administration along with listing down various types of administration.
<b>CO3</b>	Elaborate the steps in planning.
<b>CO4</b>	Explain different types of administration and elaborate functions of state level Educational bodies.
<b>CO5</b>	Describe the sources of financing in Education.

### **Core – XIV (CONTEMPORARY CONCERNS IN INDIAN EDUCATION)**

<b>CO1</b>	After completion of the course, the students shall be able to explain the concept of universalization of elementary and secondary education along with its implementation strategies.
<b>CO2</b>	To describe present position of secondary education.
<b>CO3</b>	Explaining the challenges of secondary education.
<b>CO4</b>	Explaining the present scenario of higher education and agencies for improvement.
<b>CO5</b>	Explain the concept of value education, environment education and life skills education.

### **DSE – III (PREPARATION OF SELF INSTRUCTIONAL MATERIALS (SIM) / CASE STUDY OF DISTANCE EDUCATION STUDY CENTRE)**

<b>CO1</b>	After completion of this SIM or case study, the students shall be able to prepare SIM and case study independently leading to employment generation.
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### 3. ENGLISH

#### A) PROGRAM OUTCOMES

Student graduating with a Bachelor of Arts degree in English will have demonstrated an ability to :

<b>PO1</b>	Read, interpret and write about a diverse range of texts in English.
<b>PO2</b>	Understand those texts analytically and critically.
<b>PO3</b>	Understand those texts on the basis of careful close reading.
<b>PO4</b>	Understand those texts through past and current literary theory.
<b>PO5</b>	Understand that those text are culturally constructed in time, place and tradition.
<b>PO6</b>	Understand how those texts inform culture.
<b>PO7</b>	Participate in the critical and cultural discourses of English.
<b>PO8</b>	Participate appropriately through multiple spoken and written forms.
<b>PO9</b>	Analyze instances of the variety of literary forms closely in terms of style, figurative language and convention.

#### B) PROGRAM SPECIFIC OUTCOMES

<b>PSO1</b>	The students know the nature of the subject in comparison to the secondary level.
<b>PSO2</b>	The students get more knowledge of structure and semantics.
<b>PSO3</b>	The students have the literary sense and comprehension of the subject.

#### C) COURSE OUTCOMES

##### SEMESTER – I

##### Core – I (BRITISH POETRY AND DRAMA 14<sup>TH</sup> O 17<sup>TH</sup> CENTURIES)

<b>CO1</b>	After completion of this course, the students shall be able to understand 14 <sup>th</sup> century poetry, spirit of renaissance and period of expansion of horizons.
<b>CO2</b>	Chaucer: The wife of Bath's Tale
<b>CO3</b>	Thomas Champion, Sir Philip Sidney, etc.
<b>CO4</b>	William Shakespeare: Twelfth Night.
<b>CO5</b>	Marlowe: The Jewl of Malta.

## Core – II (BRITISH POETRY AND DRAMA 17<sup>TH</sup> TO 18<sup>TH</sup> CENTURIES)

CO1	The students will be able to know Period of English revolution, the Jacobean period etc.
CO2	John Milton, John Donne, Andrew Marvel, G. Herbert.
CO3	Ben Jonson
CO4	Pope and Robert Burns.
CO5	Dryden: All for Love.

## SEMESTER – II

### Core – III (BRITISH LITERATURE: 18<sup>TH</sup> CENTURY)

CO1	This course will enable students to know Restoration, Glorious revolution, Neo-classicism, Enlightenment.
CO2	Joseph Addison
CO3	Daniel Defoe
CO4	Oliver Goldsmith and Samuel Johnson
CO5	Thomas Gray

### Core – IV (INDIAN WRITING IN ENGLISH)

CO1	After completion of this course, the students will be able to know Indian writing in English.
CO2	Crystallization: R. K. Narayan
CO3	Nissim Ezekiel, Kamala Das, Jayanta Mahapatra, A. K. Ramajan and Sarojini Naidu.
CO4	Performing: Mahesh Dattani, The final Solution.
CO5	Maturation: Amitav Ghosh, Shadow Lines.

## SEMESTER – III

### Core – V (BRITISH ROMANTIC LITERATURE)

CO1	The students after completing this course will be familiar with The Romantic Revival.
CO2	William Blake.
CO3	William Wordsworth, Samuel Taylor Coleridge and Lord Byron.
CO4	John Keats and P. B. Shelly.
CO5	William Wordsworth.

### Core – VI (19<sup>TH</sup> CENTURY BRITISH LITERATURE)

CO1	After completion of this course, the students will be familiar with the 19 <sup>th</sup> Century British literature.
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<b>CO2</b>	Charles Lamb, Willim Hazlitt, Leigh Hunt and R. L. Stevenson.
<b>CO3</b>	R. L. Stevenson(contd.).
<b>CO4</b>	Jane Austen.
<b>CO5</b>	Criticism: Matthew Arnold.

### **Core – VII (AMERICAN LITERATURE)**

<b>CO1</b>	The students will be able to know Genesis and Evolution and the defining myths of American Literature.
<b>CO2</b>	Harriet Jacobs.
<b>CO3</b>	Billy Budd.
<b>CO4</b>	Walt Whitman, Emily Dickinson, Robert Frost and Rita Dove.
<b>CO5</b>	Desire under the Elms-Eugene O’Nell.

## **SEMESTER –IV**

### **Core – VIII (BRITISH LITERATURE: EARLY 20<sup>TH</sup> CENTURY)**

<b>CO1</b>	The students will be able to understand highlights which include developments in society and economy in the western society.
<b>CO2</b>	T. S. Elliot, W. B. Yeats, Ezra Pound, T. E. Hulme and Hilda Dolittle.
<b>CO3</b>	War poetry: Wilferd Owen and Siegfred Sassoon.
<b>CO4</b>	Virginia Woolf.
<b>CO5</b>	T. S. Elliot(contd.).

### **Core – IX (EUROPEAN CLASSICAL LITERATURE)**

<b>CO1</b>	The students shall be able to know Classical Antiquity and Geographical space.
<b>CO2</b>	Epic poetry: Homer.
<b>CO3</b>	Tragedy: Sophocies.
<b>CO4</b>	Comedy: Aristophanes
<b>CO5</b>	Criticism: Aristotle.

### **Core – X (WOMEN’S WRITING)**

<b>CO1</b>	In defence of A literature of their own – Mary Wollstonecraft.
<b>CO2</b>	Desiring self: Fiction by Women from the centre.
<b>CO3</b>	Desiring and dissenting self: Fiction by Women fom the periphery.
<b>CO4</b>	Tongues of flame: Poetry by Women from across the world.
<b>CO5</b>	Discoursing at par: Literary criticism by women.

## **SEMESTER – V**

### **Core – XI (MODERN EUROPEAN DRAMA)**

<b>CO1</b>	The students will be familiar with Politics, social change and the stage and European drama.
<b>CO2</b>	Henrik Ibsen.
<b>CO3</b>	Heiner Muler.
<b>CO4</b>	Eygene Ionesco.
<b>CO5</b>	Samul Beckett.

### **Core – XII (INDIAN CLASSICAL LITERATURE)**

<b>CO1</b>	The students will be able to understand Vedic Literature.
<b>CO2</b>	Selections from epic literature.
<b>CO3</b>	Sanskrit drama.
<b>CO4</b>	Aesthetics and maxims.

### **DSE – I (LITERARY THEORY)**

<b>CO1</b>	After completion of the course, the students will be able to understand – Crises in literary criticism and the search for a method.
<b>CO2</b>	New criticism and formalism.
<b>CO3</b>	Structuralism and Poststructuralism.
<b>CO4</b>	Maxims and new Historicism.
<b>CO5</b>	Ramchandra Guha and Judith Butler.

### **DSE – II (READING WORLD LITERATURE)**

<b>CO1</b>	Concept of the idea of world literature and uses of reading world literature.
<b>CO2</b>	European literature.
<b>CO3</b>	Carribbean and African literature.
<b>CO4</b>	Canadian short fiction.
<b>CO5</b>	Latin American Poetry.

### **Semester – VI**

#### **Core – XIII (POSTCOLONIAL LITERATURE)**

<b>CO1</b>	Definition and characteristics of Post Colonial Literature.
<b>CO2</b>	Indian literature.
<b>CO3</b>	Carribbean African literature.
<b>CO4</b>	South African literature.
<b>CO5</b>	Criticism.



## Core – XIV (POPULAR LITERATURE)

CO1	Introduction to Popular literature.
CO2	Detective fiction.
CO3	Romance.
CO4	Campus Fiction.
CO5	Rewriting mythology.

## DSE – III (RESEARCH METHODOLOGY)

CO1	Research and the initial issues.
CO2	Literature review.
CO3	Hypotheses and formulation of research design.
CO4	Results and documentation.
CO5	Internal assessment.

## 4.HISTORY

### A) PROGRAM OUTCOMES

PO1	After the completion of BA, history scholars will be able to distinguish between primary and secondary sources and identify and evaluate evidence
PO2	Students will demonstrate in discussion and written work their understanding of different peoples and cultures in past environments and of how those cultures changed over the centuries.
PO3	They will be able to produce their own historical analysis of documents and develop the ability to think critically and historically when discussing the past
PO4	The study of history will give them the ability to compare and contrast different processes, modes of thoughts and modes of expression from different historical time periods and in different geographical areas.
PO5	Students will offer multi-causal explanations of major historical developments based on a contextualized analysis of interrelated political, social, economic, cultural and intellectual processes
PO6	Students will be able to write an original research paper that locates and synthesizes relevant primary and secondary sources and has a clear, coherent and plausible argument, logical structure, proper references.
PO7	Students will present orally their research or a summary of another's research in an organized, coherent and compelling fashion.

### B) PROGRAM SPECIFIC OUTCOMES

PSO1	Students will have the ability to apply historical methods to evaluate critically the past and how historians and others have interpreted it.
PSO2	Students will be able to acquire basic historical research skills, including the effective use of libraries, archives and data bases.

<b>PSO3</b>	Students will be able to organise and express their thoughts clearly and coherently both in writing and orally.
<b>PSO4</b>	Students will be able to demonstrate broad knowledge of historical events and periods and their significance
<b>PSO5</b>	Students will be able to recognise how different individuals, groups, organisations, societies, cultures, countries and nations have affected history. History gave the students wisdom and foresight for the future.

### **C) COURSE OUTCOMES SEMESTER – I**

#### **Core – I (HISTORY OF INDIA – I)**

<b>CO1</b>	After completing this course, the students shall be able to Reconstruct Ancient Indian History.
<b>CO2</b>	Pre-historic hunter-gatherers.
<b>CO3</b>	The advent of food production.
<b>CO4</b>	The Harappan civilization.
<b>CO5</b>	Cultures in transition.

#### **Core – II (SOCIAL FORMATIONS AND CULTURAL PATTERNS)**

<b>CO1</b>	On completing the course, the students will be able to understand Evolution of humankind.
<b>CO2</b>	Neolithic culture.
<b>CO3</b>	Bronze age civilizations.
<b>CO4</b>	Nomadic groups in central and west Asia.
<b>CO5</b>	Ancient Greece.

### **SEMESTER – II**

#### **Core – III (HISTORY OF INDIA – II)**

<b>CO1</b>	The students will be able to understand Economy and Society.
<b>CO2</b>	Changing political formations (circa 300BCE to circa CE).
<b>CO3</b>	Towards early medieval India (circa CE fourth century to CE 750).
<b>CO4</b>	Religion, philosophy and society (circa 300 BCE-CE 750).
<b>CO5</b>	Cultural developments (circa 300 BCE-CE 750).

#### **Core – IV (SOCIAL FORMATIONS AND CULTURAL PATTERNS OF THE MEDIEVAL WORLD)**

<b>CO1</b>	The students will study Roman Republic.
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<b>CO2</b>	Religion and culture in ancient Rome.
<b>CO3</b>	Economic developments in Europe from 7 <sup>th</sup> to 14 <sup>th</sup> centuries.
<b>CO4</b>	Religion and culture in medieval Europe.
<b>CO5</b>	Societies in Central Islamic lands.

### **SEMESTER –III**

#### **Core – V (HISTORY OF INDIA – III)**

<b>CO1</b>	In this course, students will be studying early Medieval India.
<b>CO2</b>	Political Structure.
<b>CO3</b>	Agrarian Structure and Social change.
<b>CO4</b>	Trade and Commerce.
<b>CO5</b>	Religious and Cultural developments.

#### **Core – VI (RISE OF MODERN WEST – I)**

<b>CO1</b>	The students will be able to know transition from feudalism to capitalism.
<b>CO2</b>	Early colonial expansion.
<b>CO3</b>	Renaissance.
<b>CO4</b>	The reformation.
<b>CO5</b>	Economic developments of the sixteenth century.

#### **Core – VII (HISTORY OF INDIA – IV)**

<b>CO1</b>	After completion of the paper, the students shall be able to interpret the sources of Delhi Sultanate.
<b>CO2</b>	Sultanate Political structures.
<b>CO3</b>	Emergence of Regional identities.
<b>CO4</b>	Society and economy.
<b>CO5</b>	Religion, society and culture.

### **SEMESTER – IV**

#### **Core – VIII (RISE OF MODERN WEST – II)**

<b>CO1</b>	The students will be able to understand 17 <sup>th</sup> century European crises.
<b>CO2</b>	The English revolution and European politics in the 18 <sup>th</sup> century.
<b>CO3</b>	Rise of modern science.
<b>CO4</b>	Mercantilism, European economies and Preludes to the Industrial Revolution.
<b>CO5</b>	The American Revolution of 1776.

#### **Core – IX (HISTORY OF INDIA – V)**

<b>CO1</b>	The students will be able to find out sources and Historiography.
<b>CO2</b>	Establishment of Mughal rule.
<b>CO3</b>	Consolidation of Mughal rule.
<b>CO4</b>	Society and economy.
<b>CO5</b>	Cultural ideas.

### **Core – X (HISTORICAL THEORIES & METHODS)**

<b>CO1</b>	After completion of this course, the students shall be able to understand the meaning and scope of History.
<b>CO2</b>	Traditions of Historical Writings.
<b>CO3</b>	History as Interdisciplinary practice.
<b>CO4</b>	Modern theories.
<b>CO5</b>	Historical methods.

### **SEMESTER – V**

#### **Core – XI (HISTORY OF MODERN EUROPE – I)**

<b>CO1</b>	The students will be able to understand The French Revolution.
<b>CO2</b>	Revolution and its European repercussions.
<b>CO3</b>	Restoration and Revolution: c. 1815 – 1848.
<b>CO4</b>	Capitalist Industrialization and Socio-Economic transformation.
<b>CO5</b>	Varieties of Nationalism and the remaking of states in the 19 <sup>th</sup> and 20 <sup>th</sup> centuries.

#### **Core – XII (HISTORY OF INDIA – VII)**

<b>CO1</b>	After completion of the course, the students shall be able to understand India in the mid 18 <sup>th</sup> century.
<b>CO2</b>	Expansion and consolidation of colonial power.
<b>CO3</b>	Colonial state of ideology.
<b>CO4</b>	Economy and society.
<b>CO5</b>	Popular resistance: causes and consequences.

#### **DSE – I (HISTORY OF THE UNITED STATES OF AMERICA)**

<b>CO1</b>	The students will be able to know the background of USA.
<b>CO2</b>	Making of the republic.
<b>CO3</b>	Evolution of American Democracy.
<b>CO4</b>	Early capitalism.
<b>CO5</b>	The Agrarian south and civil war.

#### **DSE – II (HISTORY AND CULTURE OF ODISHA)**

<b>CO1</b>	The students will be able to know socio-political life of early and medieval Odisha.
<b>CO2</b>	Religion, Art and Literature of early and medieval Odisha.
<b>CO3</b>	Political and economic structure in medieval Odisha.
<b>CO4</b>	Colonialism in Odisha.
<b>CO5</b>	Socio-cultural changes in modern Odisha.

## **SEMESTER – VI**

### **Core – XIII (HISTORY OF INDIA – VIII)**

<b>CO1</b>	The students are expected to know cultural changes and social and religious reform movements.
<b>CO2</b>	Nationalism: Trends upto 1919.
<b>CO3</b>	Gandhian nationalism after 1919: Ideas and movements.
<b>CO4</b>	Communalism and Partition.
<b>CO5</b>	Emergence of a New State.

### **Core – XIV (HISTORY OF MODERN EUROPE – II)**

<b>CO1</b>	The students will be able to know liberal democracy, working class movements and socialism in the 19 <sup>th</sup> and 20 <sup>th</sup> centuries.
<b>CO2</b>	The crises of feudalism in Russia and experiments in socialism.
<b>CO3</b>	Imperialism, war and crises: c. 1880-1939.
<b>CO4</b>	Cultural transformation since circa 1850.
<b>CO5</b>	Intellectual developments since circa 1850.

### **DSE – III (HISTORY OF UNITED STATES OF AMERICA – II)**

<b>CO1</b>	The students shall be able to know about Reconstructions: Political changes and Economic transformation.
<b>CO2</b>	Resistance and reform.
<b>CO3</b>	U.S. imperialism.
<b>CO4</b>	Afro-American movements.
<b>CO5</b>	Socio-Cultural, religious and intellectual movements.

## 5.HOME SCIENCE

### A) PROGRAM OUTCOMES

<b>PO1</b>	<b>CRITICAL THINKING:</b> Take an informed and analytical approach to learning and demonstrate in-depth knowledge of the subject and give opinion(s) supported by logical reasoning that one have judged to be appropriate and understanding different approaches and using them .
<b>PO2</b>	<b>EFFECTIVE COMMUNICATION:</b> Demonstrate proficiency in communicating competently in groups and organizations, competence in interpersonal communication; possess skills to effectively deliver formal and informal presentations to a variety of audiences in multiple contexts .
<b>PO3</b>	<b>SOCIAL INTERACTION:</b> Foster social skills and peer interaction enabling them to make all people feel valued and respect their differences by being responsible citizens for creating a socially inclusive society GPO.4
<b>PO4</b>	<b>ETHICAL STANDARDS:</b> Recognize values such as justice, trust, equity, fairness, kindness and develop a commitment to meeting and upholding standards of ethical behavior in all walks of life and comprehending the moral dimensions of decisions and actions.
<b>PO5</b>	<b>ENVIRONMENTAL CONSCIOUSNESS:</b> Discern the issues of environmental contexts and engages in promoting values and attitudes that claim coexistence and sustainable living with reduced, minimal, or no harm upon ecosystems .
<b>PO6</b>	<b>LIFELONG LEARNING:</b> Acquire the skill to be an independent lifelong learner embracing real-time changes in the socio-technological context, promoting continuous development and improvement of the knowledge and skills needed for employment and personal fulfilment.

### B) PROGRAM SPECIFIC OUTCOMES

<b>PSO1</b>	Understand the basic concepts of Human Physiology, biochemistry, microbiology, environment and Human rights.
<b>PSO2</b>	Plan and prepare diet for healthy life style using the principles of food science and nutrition.
<b>PSO3</b>	Understand the principles and patterns of growth and development of humans from conception to old age and the role of family in development.
<b>PSO4</b>	Acquire scientific skills in the management of resources and develop basic skills for career options in the fields of dietetics, interior designing, textiles and fashion designing and preschool education.
<b>PSO5</b>	Appreciate the role of Home Science extension in community development and to conduct effective extension education programmes through different media.
<b>PSO6</b>	Apply the acquired conceptual knowledge of food quality assurance and sustainable waste management for holistic living .
<b>PSO7</b>	Use concepts, tools and techniques related to Chemistry and Zoology and its application in Home Science.
<b>PSO8</b>	Organize and deliver relevant applications of knowledge through effective

	written, verbal, graphical/virtual communications and internet productivity with people from diverse backgrounds.
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### **C) COURSE OUTCOMES SEMESTER – I**

#### **Core – 1 (INTRODUCTION TO NUTRITION AND FOOD SCIENCE)**

<b>CO1</b>	Basic concepts in food and nutrition.
<b>CO2</b>	Nutrients.
<b>CO3</b>	Food
<b>CO4</b>	Methods of cooking and preventing nutrient losses.

#### **Core – II (INTRODUCTION TO TEXTILE SCIENCE)**

<b>CO1</b>	Textiles.
<b>CO2</b>	Fibre Science.
<b>CO3</b>	Yarn Science.
<b>CO4</b>	Fabric Production.

### **SEMESTER – II**

#### **Core – III (INTRODUCTION TO FAMILY RESOURCE MANAGEMENT)**

<b>CO1</b>	Home management.
<b>CO2</b>	Family resources.
<b>CO3</b>	Time management.
<b>CO4</b>	Energy management.

#### **Core – IV (HUMAN PHYSIOLOGY)**

<b>CO1</b>	Digestive system.
<b>CO2</b>	Circulatory system.
<b>CO3</b>	Respiratory system.
<b>CO4</b>	The endocrine system.

### **SEMESTER – III**

#### **Core – V (HUMAN DEVELOPMENT)**

<b>CO1</b>	Prenatal development.
<b>CO2</b>	Physical development.

<b>CO3</b>	Social development.
<b>CO4</b>	Definition, value characteristics and types of play.

#### **Core – VI (FAMILY MEAL PLANNING)**

<b>CO1</b>	Basic concepts and importance of meal planning.
<b>CO2</b>	Meal planning during childhood.
<b>CO3</b>	Meal planning during the adult years.
<b>CO4</b>	Meal planning during the physiological stress.

#### **Core – VII (FAMILY CLOTHING AND CARE)**

<b>CO1</b>	Clothing selection.
<b>CO2</b>	Clothing needs of the family members at different age groups.
<b>CO3</b>	Laundry products.
<b>CO4</b>	Laundry procedures (washing of cotton, silk and woollen garments).

### **SEMESTER – IV**

#### **Core – VIII (FAMILY FINANCE AND CONSUMER SCIENCE)**

<b>CO1</b>	Money management.
<b>CO2</b>	Planning for family finance security.
<b>CO3</b>	Right and responsibility of consumer.
<b>CO4</b>	Consumer education.

#### **Core – IX (HOME SCIENCE EXTENSION EDUCATION)**

<b>CO1</b>	Extension education.
<b>CO2</b>	Home science extension education.
<b>CO3</b>	Extension teaching methods.
<b>CO4</b>	Teaching learning process.

#### **Core – X (TEXTILE CHEMISTRY)**

<b>CO1</b>	Identification of fibres.
<b>CO2</b>	Finishes.
<b>CO3</b>	Dyeing
<b>CO4</b>	Water.

### **SEMESTER – V**

#### **Core – XI (MARRIAGE AND FAMILY DYNAMICS)**



<b>CO1</b>	Marriage.
<b>CO2</b>	Marriage rituals and ceremonies in different Indian communities.
<b>CO3</b>	Family.
<b>CO4</b>	Problems of family and marital life.

### **Core – XII (RESEARCH METHODOLOGY)**

<b>CO1</b>	Research-Meaning, objective and types of research.
<b>CO2</b>	Research Process-Techniques involved in defining research problems.
<b>CO3</b>	Processing and analysis of data – Editing, coding, classification and tabulation of data.
<b>CO4</b>	Interpretation and report writing.

### **DSE – I (COMMUNITY NUTRITION)**

<b>CO1</b>	Concept of community, health and nutrition.
<b>CO2</b>	Common nutritional problems in India.
<b>CO3</b>	Role of International and national agency in combating malnutrition.
<b>CO4</b>	Role of national agency in combating malnutrition.

### **DSE – II (FUNDAMENTALS OF ART AND DESIGN)**

<b>CO1</b>	An introduction to art design in interiors.
<b>CO2</b>	Colour-importance, characteristics and application.
<b>CO3</b>	Furniture and its arrangement.
<b>CO4</b>	The kitchen.

## **SEMESTER – VI**

### **Core – XIII (INTRODUCTION TO FOOD PRESERVATION)**

<b>CO1</b>	Introduction to food preservation.
<b>CO2</b>	Preservation by the use of temperature.
<b>CO3</b>	Preservation by removal of moisture.
<b>CO4</b>	Preservation by using sugar, chemicals and salt.

### **Core – XIV (COMMUNICATION IN EXTENSION EDUCATION)**

<b>CO1</b>	Communication.
<b>CO2</b>	Models of communication.
<b>CO3</b>	Audio-visual aids classification.
<b>CO4</b>	Diffusion and adoption.

## DSE – III (EARLY CHILDHOOD CARE)

<b>CO1</b>	Early childhood care.
<b>CO2</b>	Children's environment.
<b>CO3</b>	Psychological care of the child.
<b>CO4</b>	Early childhood care and development in India.
<b>CO5</b>	Provisions and policies for child care and development in India.

## 6. PHILOSOPHY

### A) PROGRAM OUTCOMES

<b>PO1</b>	Students graduating through B.A. Hons Programme in Philosophy from this college are expected develop an analytical skill which will enable them to solve the problem related issues that he faces in next level of studies.
<b>PO2</b>	Students, although at the initial stage after getting admission faces difficulty in their language skill, but when they pass the programme, they are expected to become pretty able to communicate their understanding in the subject.
<b>PO3</b>	Students of this programme will become capable to ask questions, critically appreciate a scholarly presentation of any form and debate upon the issues which invite cross discussions.
<b>PO4</b>	Students graduating from this college in this programme become able to relate the social and national issues to what they have learnt from their books and in the classroom situations.
<b>PO5</b>	Project work and field study give them an experience to learn by themselves and experiment with the theoretical knowledge that they were given within the four wall of the classroom.
<b>PO6</b>	Students completing the programme become confident in the sense that they feel they are employable.
<b>PO7</b>	This college trains the students to undertake primary level of research work and thus they become motivated for advanced research when they go for higher studies.
<b>PO8</b>	The programme instils among the students the greater values of life to become worthy citizen of the country.

### B) PROGRAM SPECIFIC OUTCOMES

<b>PSO1</b>	BA Philosophy Honours students will be able to acquire knowledge that is vital to the disciple of Philosophy, including knowledge of core concepts, distinctions, theories, argumentative techniques, movements and influential figures within the core fields of aesthetics, ethics, epistemology, logic, metaphysics, social and political Philosophy.
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<b>PSO2</b>	The students will be able to reason clearly, employing the principles of logic to construct cogent arguments in both speech and writing.
<b>PSO3</b>	The students will be able to speak and write clearly and cogently.
<b>PSO4</b>	They will be able to think creatively and independently.
<b>PSO5</b>	The students will develop a strong set of critical, imaginative and informed reasoning skills which will help them to understand human mind.

### **C) COURSE OUTCOMES SEMESTER – I**

#### **Core – I (GENERAL PHILOSOPHY)**

<b>CO1</b>	Definition, nature and function of Philosophy.
<b>CO2</b>	Problems of being: Monism and Pluralism.
<b>CO3</b>	Problems of knowledge.
<b>CO4</b>	Problems of ethics.
<b>CO5</b>	Problems of metaphysics.

#### **Core – II (LOGIC AND SCIENTIFIC METHOD)**

<b>CO1</b>	Definition of logic.
<b>CO2</b>	Classification of propositions.
<b>CO3</b>	Inference – Immediate inference.
<b>CO4</b>	Inductive reasoning and scientific enquiry.
<b>CO5</b>	Science and probability.

### **SEMESTER – II**

#### **Core – III (SYSTEMS OF INDIAN PHILOSOPHY – I)**

<b>CO1</b>	Salient features of Indian Philosophy.
<b>CO2</b>	Carvakas.
<b>CO3</b>	Jainism.
<b>CO4</b>	Bhuddhism.
<b>CO5</b>	Samkhya dualistic system.

#### **Core – IV (SYMBOLIC LOGIC)**

<b>CO1</b>	Introduction to symbolic logic.
<b>CO2</b>	The calculus of propositions.
<b>CO3</b>	The elements of predicate calculus.

### **SEMESTER –III**

### **Core – V (SYSTEMS OF INDIAN PHILOSOPHY – II)**

<b>CO1</b>	Yoga system of Patanjali.
<b>CO2</b>	Nyaya:Pramanas.
<b>CO3</b>	Upanisadic view of Atma and Brahman Vidya and Avidya.
<b>CO4</b>	Sankara's view on Maya, jiva, isvara.
<b>CO5</b>	Ramanuja.

### **Core – VI (ETHICS)**

<b>CO1</b>	Definition, nature and scope of ethics.
<b>CO2</b>	Distinction between moral and non-moral action.
<b>CO3</b>	Utilitarianism, hedonism.
<b>CO4</b>	Rigorism, perfectionism.
<b>CO5</b>	Theories of punishment; Retributive, Reformative and Preventive theory.

### **Core – VII (HISTORY OF GREEK PHILOSOPHY)**

<b>CO1</b>	Nature of Greek Philosophy.
<b>CO2</b>	Pre-Socratic Thought.
<b>CO3</b>	Socrates.
<b>CO4</b>	Plato.
<b>CO5</b>	Aristotle.

## **SEMESTER – IV**

### **Core – VIII (CONTEMPORARY INDIAN PHILOSOPHY)**

<b>CO1</b>	R. N. Tagore.
<b>CO2</b>	Swami Vivekananda.
<b>CO3</b>	Sri Aurobindo.
<b>CO4</b>	M. K. Gandhi.
<b>CO5</b>	S. Radhakrishnan.

### **Core – IX**

<b>CO1</b>	Bacon-Theory of Idola.
<b>CO2</b>	Spinoza.
<b>CO3</b>	Locke.
<b>CO4</b>	Hume.
<b>CO5</b>	Kant.

### Core – X (PHILOSOPHY OF LANGUAGE)

CO1	Word-Meaning.
CO2	Definitions: Denotative, Connotative and Ostensive defining.
CO3	Sentence-Meaning; Proposition and sentence word-meaning and sentence-meaning.
CO4	Analytic-synthetic, a priori and a posterior, distinction.
CO5	Concept; Nature and source.

### SEMESTER – V

#### Core – XI (STUDY OF WESTERN CLASSIC)

CO1	Meditation - Sceptical doubts.
CO2	Meditation – Clear and distinct perceptions Theory of ideas.
CO3	Meditation – God is no Deceiver.
CO4	Meditation – Essence of Material Things.
CO5	Meditation – Mind-body Dualism.

#### Core – XII (ISAUPANISADS WITH SANKARA’S COMMENTARY)

CO1	What are Upanishads ?
CO2	Mantras.

### SEMESTER –VI

#### Core – XIV (APPLIED ETHICS)

CO1	What is applied Ethics?
CO2	Taking life : Animals.
CO3	Environmental Ethics.
CO4	Professional Ethics –Business and Bio-medical Ethics.

#### DSE – III (GANDHIAN STUDIES)

CO1	Political thought of Gandhi.
CO2	Economic Thought of Gandhi.
CO3	Gandhi’s social thought and social work.
CO4	Gandhi on Education and his idea of peace.

## 7. POLITICAL SCIENCE

### A) PROGRAM OUTCOMES

<b>PO1</b>	Students graduating through B.A. Hons Programme in Political Science from this college are expected develop an analytical skill which will enable them to solve the problem related issues that he faces in next level of studies.
<b>PO2</b>	Students, although at the initial stage after getting admission faces difficulty in their language skill, but when they pass the programme, they are expected to become pretty able to communicate their understanding in the subject
<b>PO3</b>	Students of this programme will become capable to ask questions, critically appreciate a scholarly presentation of any form and debate upon the issues which invite cross discussions.
<b>PO4</b>	Students graduating from this college in this programme become able to relate the social and national issues to what they have learnt from their books and in the classroom situations.
<b>PO5</b>	Project work and field study give them an experience to learn by themselves and experiment with the theoretical knowledge that they were given within the four wall of the classroom.
<b>PO6</b>	Students completing the programme become confident in the sense that they feel they are employable.
<b>PO7</b>	This college trains the students to undertake primary level of research work and thus they become motivated for advanced research when they go for higher studies.
<b>PO8</b>	The programme instils among the students the greater values of life to become worthy citizen of the country.

### B) PROGRAM SPECIFIC OUTCOMES

<b>PSO1</b>	A basic understanding of the Programme creates capabilities to articulate and participate as an informed and responsible citizen who has a direct role to play in nation-building.
<b>PSO2</b>	The Programme provides an introduction to the dynamics of Indian politics.
<b>PSO3</b>	This activity equips the student for competitive exams conducted by UPSC, WBPS, SSC, NET, SET and enhances employability.

<b>PSO4</b>	For those opting for a career in politics, study of this Programme greatly props ones meaningful engagement with policymaking and its implementation by developing relevant skills.
<b>PSO5</b>	With an exposure to the functioning of different political systems across the world and their constitutions and governing structures, students would have a leeway in taking up leadership roles as a result of this activity that enhances skills.

### **C) COURSE OUTCOMES SEMESTER – I**

#### **Core – I (UNDERSTANDING POLITICAL THEORY)**

<b>CO1</b>	Introducing Political Theory.
<b>CO2</b>	Traditions of Political Theory.
<b>CO3</b>	Democracy: The History of an idea.
<b>CO4</b>	Procedural Democracy and its critique.
<b>CO5</b>	Participation and representation.

#### **Core – II (CONSTITUTIONAL GOVERNMENT AND DEMOCRACY IN INDIA)**

<b>CO1</b>	Philosophy of the Constitution.
<b>CO2</b>	Fundamental Rights and Directive Principles.
<b>CO3</b>	The Legislature : Parliament and The Executive: President and Prime Minister.
<b>CO4</b>	The Judiciary: Supreme Court.
<b>CO5</b>	Federalism: Divisions of Powers, Emergency Provisions, Fifth and Sixth Schedules and Panchayati Raj and Municipalities.

### **SEMESTER – II**

#### **Core – III (POLITICAL THEORY-CONCEPTS AND DEBATES)**

<b>CO1</b>	Negative freedom: Liberty and Positive freedom: Freedom as Emancipation and Development.
<b>CO2</b>	Formal Equality: Equality of opportunity, Political equality, Egalitarianism.
<b>CO3</b>	Procedural Justice, Distributive Justice and Global Justice.
<b>CO4</b>	Natural Rights, Moral and Legal Rights, three generations of Rights and Rights and Obligations.
<b>CO5</b>	Major debates.

#### **Core – IV (POLITICAL PROCESS IN INDIA)**

<b>CO1</b>	Political parties and the party system.
<b>CO2</b>	Determinants of voting behaviour.
<b>CO3</b>	Regional aspirations.
<b>CO4</b>	Caste and Politics.
<b>CO5</b>	The changing nature of the Indian State.

### **SEMESTER – III**

#### **Core – V (INTRODUCTION TO COMPARATIVE GOVERNMENT AND POLITICS)**

<b>CO1</b>	Understanding comparative politics.
<b>CO2</b>	Historical context of modern government.
<b>CO3</b>	Colonialism and decolonialism.
<b>CO4</b>	Themes of comparative analysis – Britain, Brazil, Nigeria and China.

#### **Core – VI (PERSPECTIVES ON PUBLIC ADMINISTRATION)**

<b>CO1</b>	Public administration as a discipline.
<b>CO2</b>	Theoretical perspectives.
<b>CO3</b>	Neo-Classical theories.
<b>CO4</b>	Public policy.
<b>CO5</b>	Major approaches in public administration.

#### **Core – VII (PERSPECTIVES ON INTERNATIONAL RELATIONS AND WORLD HISTORY)**

<b>CO1</b>	Studying International relations.
<b>CO2</b>	Classical realism and Neo-Realism & Liberalism and Neo-liberalism.
<b>CO3</b>	Marxist approaches, Feminist perspectives, Eurocentricism and perspectives from the global south.
<b>CO4</b>	World War – I, Significance of the Bolshevik Revolution, Rise of Facism and World War – II.
<b>CO5</b>	Cold War, Emergence of the third World, collapse of the USSR, post Cold War.

### **SEMESTER – IV**

#### **Core – VIII (POLITICAL PROCESSES AND INSTITUTIONS IN COMPARATIVE PERSPECTIVE)**

<b>CO1</b>	Approaches to studying comparative politics.
<b>CO2</b>	Electoral system.
<b>CO3</b>	Party system.
<b>CO4</b>	Nation-State.
<b>CO5</b>	Democratization.



### **Core – IX (PUBLIC POLICY AND ADMINISTRATION IN INDIA)**

<b>CO1</b>	Public policy.
<b>CO2</b>	Decentralization.
<b>CO3</b>	Budget.
<b>CO4</b>	Citizen and Administration interference.
<b>CO5</b>	Social welfare administration.

### **Core – X (GLOBAL POLITICS)**

<b>CO1</b>	Globalization: Conceptions and Perspectives.
<b>CO2</b>	Contemporary Global issues.
<b>CO3</b>	Ecological issues, proliferation of Nuclear Weapons and International Terrorism.
<b>CO4</b>	Migration, Human Security.

### **SEMESTER – V**

### **Core – XI (CLASSICAL POLITICAL PHILOSOPHY)**

<b>CO1</b>	Text and interpretation.
<b>CO2</b>	Antiquity Plato and Aristotle.
<b>CO3</b>	Interlude : Machiavelli
<b>CO4</b>	Possessive individualism hobbes.
<b>CO5</b>	Locke: Laws of Nature and Presentation themes.

### **Core – XII (INDIAN POLITICAL THOUGHT – I)**

<b>CO1</b>	Traditions of Pre-colonial Indian Political Thought.
<b>CO2</b>	Ved Vyasa: Rajadharma and Manu: Social laws.
<b>CO3</b>	Kautilya: Theory of State.
<b>CO4</b>	Aggannasutta: Theory of Kingship.
<b>CO5</b>	Abul Fazal: Syncretism.

### **DSE – I (HUMAN RIGHTS IN A COMPARATIVE PERSPECTIVE)**

<b>CO1</b>	Human Rights: Theory and Institutionalization.
<b>CO2</b>	Issue: Torture-USA and India.
<b>CO3</b>	Surveillance and Censorship: China and India.
<b>CO4</b>	Caste and Race: South Africa and India.
<b>CO5</b>	Gender and Violence, Adivasis/Aboriginals and the Land Question: Australia and India.

### **DSE – II (INDIA'S FOREIGN POLICY IN A GLOBALIZATION WORLD)**

<b>CO1</b>	India's Foreign Policy: From a postcolonial state to an aspiring global power.
<b>CO2</b>	India's relations with the USA and USSR/Russia , India's engagements with china.
<b>CO3</b>	India in South Asia: Debating Regional Strategies.
<b>CO4</b>	India's negotiating style and strategies: Trade, Environment and Security regimes.
<b>CO5</b>	India in the contemporary multipolar world.

## **SEMESTER – VI**

### **Core – XIII (MODERN POITICAL PHILOSOPHY)**

<b>CO1</b>	Modernity and its discourses.
<b>CO2</b>	Romantics – Jean Jacques Rousseau and Mary Wollstonecraft.
<b>CO3</b>	Liberal socialist – John Stuart Mill.
<b>CO4</b>	Radicals – Karl Marx.
<b>CO5</b>	Alexandra Kollontal.

### **Core – XIV (INDIAN POLITICAL THOUGHT – II)**

<b>CO1</b>	<b>Introduction to modern Indian Political Thought – Rammohan Roy: Rights.</b>
<b>CO2</b>	<b>Pandit Ramabai: Gender, Vivekananda: Ideal Society.</b>
<b>CO3</b>	<b>Gandhi: Swaraj, Ambedkar: Social Justice.</b>
<b>CO4</b>	<b>Tagore: Critique of Nationalism, Iqbal: Community and Savarkar: Hindutva.</b>
<b>CO5</b>	<b>Nehru: Secularism and Lohia: Socialism.</b>

### **DSE – III (WOMeN, POWER AND POLITICS)**

<b>CO1</b>	<b>Patriarchy.</b>
<b>CO2</b>	<b>Feminism.</b>
<b>CO3</b>	<b>Family, Community and State.</b>
<b>CO4</b>	<b>History of the Women's Movement in India and Violence against women.</b>
<b>CO5</b>	<b>Work and Labour.</b>

## **8. SANSKRIT**

### **A) PROGRAM OUTCOMES**

<b>PO1</b>	Students graduating through B.A. Hons Programme in Sanskrit from this college are expected develop an analytical skill which will enable
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	them to solve the problem related issues that he faces in next level of studies.
<b>PO2</b>	Students, although at the initial stage after getting admission faces difficulty in their language skill, but when they pass the programme, they are expected to become pretty able to communicate their understanding in the subject.
<b>PO3</b>	Students of this programme will become capable to ask questions, critically appreciate a scholarly presentation of any form and debate upon the issues which invite cross discussions.
<b>PO4</b>	Students graduating from this college in this programme become able to relate the social and national issues to what they have learnt from their books and in the classroom situations.
<b>PO5</b>	Project work and field study give them an experience to learn by themselves and experiment with the theoretical knowledge that they were given within the four wall of the classroom.
<b>PO6</b>	Students completing the programme become confident in the sense that they feel they are employable.
<b>PO7</b>	This college trains the students to undertake primary level of research work and thus they become motivated for advanced research when they go for higher studies.
<b>PO8</b>	The programme instils among the students the greater values of life to become worthy citizen of the country

## **B) PROGRAM SPECIFIC OUTCOMES**

<b>PSO1</b>	Students are expected to develop the Sanskrit language skill to communicate both in writing and verbally.
<b>PSO2</b>	It is expected that at the end of the programme students will get a fair knowledge of the development of Sanskrit language and literature vis-à-vis its culture – how it emerged, evolved and sustained through the passage of more than thousand years.
<b>PSO3</b>	After graduating they are expected to grow the sense of art and literature that will enable them to understand better the human social and cultural relationships.
<b>PSO4</b>	Students will also become able to appreciate the art and literature, especially in terms of great Indian heritage which is embedded in Sanskrit literature.
<b>PSO5</b>	Students are also expected to learn analytical skills while learning the appreciation ability.

## **C) COURSE OUTCOMES SEMESTER – I**

**Core – I (MORAL TEACHINGS AND BASICS OF SANSKRIT)**

CO1	Hitopadesa.
CO2	Yaksaprasna of Mahabharata
CO3	Sabdarupa and dhaturupa.

**Core – II (DRAMA-I & HISTORY OF SANSKRIT LITERATURE-I)**

CO1	Abhijnanasakuntalam (Act I – IV)
CO2	History of Sanskrit Literature-I.

**SEMESTER – II**

**Core – III (DRAMA-II & DRAMATURGY)**

CO1	Abhijnanasakuntalam (Act V-VII)
CO2	Dramaturgy.

**Core – IV (AN INTRODUCTION TO THE TECHNIQUE OF PANINIAN GRAMMAR & PROSODY)**

CO1	Vocabulary relevant to Sanskrit grammar and arrangement of Paninian Grammar.
CO2	Samjnaprakaranam.
CO3	Chandas.

**SEMESTER – III**

**Core – V (POETRY & HISTORY OF SANSKRIT LITERATURE-II)**

CO1	Meghadutam.
CO2	History of Sanskrit Literature-II.

**Core – VI (META-RULES OF PANINIAN GRAMMAR, POETICS AND FIGURES OF SPEECH)**

CO1	Paribhasaprakaranam.
CO2	Sahityadarpanah (Ch. I & II)
CO3	Sahityadarpanah (Alamkaras).

**Core – VII (CASES AND CASE ENDINGS IN PANINIAN GRAMMAR & TRANSLATION-I)**

<b>CO1</b>	Siddhantakaumudi (Karka-Vibhakti I-IV)
<b>CO2</b>	Translation from Sanskrit-Odia/English.

## **SEMESTER –IV**

### **Core – VIII (INSCRIPTIONS, UPANISAD & BHAGAVADGITA)**

<b>CO1</b>	Inscriptions.
<b>CO2</b>	Kathopanisad .
<b>CO3</b>	Bhagavatagita.

### **Core – IX (CASE AND CASE ENDINGS OF PANINIAN GRAMMAR, TRANSLATION-II)**

<b>CO1</b>	Siddhantakaumudi.
<b>CO2</b>	Translation from Odia/English passage-Sanskrit.
<b>CO3</b>	Amarakosa.

### **Core – X (ORNATE PROSE & PROSE WRITING)**

<b>CO1</b>	Dasakumarracharitam.
<b>CO2</b>	Sukanasopadesa.
<b>CO3</b>	Essay in Sanskrit.
<b>CO4</b>	Expansion of idea in Sanskrit.

## **SEMESTER – V**

### **Core – XI (ORNATE POETRY IN SANSKRIT & HISTORY OF SANSKRIT LITERATURE-III)**

<b>CO1</b>	Sisupalabadham.
<b>CO2</b>	Kiratarjunyam.
<b>CO3</b>	History of Sanskrit Literature-III (Mahakavyas and Champu).

### **Core – XII (VEDA, VEDIC GRAMMAR & HISTORY OF VEDIC LITERATURE)**

<b>CO1</b>	Vedic Suktas.
<b>CO2</b>	Vedic Grammar.
<b>CO3</b>	History of Vedic Literature.

### **DSE – I (THE SCIENCE OF VASTU AND VRKSA)**

<b>CO1</b>	Gruhopakarana Prakarana of Vastu Ratnakara.
<b>CO2</b>	Vrksayurveda in Brhatsamhita.

## DSE- II (SOCIO-POLITICAL THOUGHT IN ANCIENT INDIA)

CO1	Yajnavalkyasmrti.
CO2	Manusmrti.

## SEMESTER – VI

### Core – XIII (ARTHASASTRA, DHARMASASTRA AND AYURVEDA)

CO1	Arthasastra.
CO2	Manusmrti.
CO3	Ayurveda.

### Core – IV (TECHNICAL LITERATURE IN SANSKRIT)

CO1	Jyotisha.
CO2	Vastu.

### DSE – III (ETHICAL LITERATURE IN SANSKRIT)

CO1	Chanakyaniti.
CO2	Nitisataka of Bhartrhari.
CO3	Viduraniti.

## 9. SOCIOLOGY

### A) PROGRAM OUTCOMES

PO1	Sociology seeks to understand all aspects of human social behaviour, including the behaviour of individuals as well as the social dynamics of small groups, large organizations, communities, institutions, and entire societies.
PO2	Sociologists are typically motivated both by the desire to better understand the principles of social life and by the conviction that understanding these principles may aid in the formulation of enlightened and effective social policy.
PO3	Sociology provides an intellectual background for students considering careers in the professions or business.
PO4	Students graduating through B.A. Honsin Sociology Programme from this college are expected develop an analytical skill which will enable them to solve the problem related issues that he faces in next level of studies.
PO5	Students, although at the initial stage after getting admission faces difficulty in their language skill, but when they pass the programme, they are expected to become pretty able to communicate their understanding in the subject.
PO6	Students of this programme will become capable to ask questions, critically appreciate a scholarly presentation of any form and debate upon

	the issues which invite cross discussions.
<b>PO7</b>	Students graduating from this college in this programme become able to relate the social and national issues to what they have learnt from their books and in the classroom situations.
<b>PO8</b>	Project work and field study give them an experience to learn by themselves and experiment with the theoretical knowledge that they were given within the four wall of the classroom.

## **B) PROGRAM SPECIFIC OUTCOMES**

<b>PSO1</b>	Critical Thinking: The programme seeks to develop in students the sociological knowledge and skills that will enable them to think critically and imaginatively about society and social issues.
<b>PSO2</b>	Sociological Understanding: The ability to demonstrate sociological understandings of phenomena, for example, how individual biographies are shaped by social structures, social institutions, cultural practices, and multiple axes of difference and inequality.
<b>PSO3</b>	Written and Oral Communication: The ability to formulate effective and convincing written and oral arguments.
<b>PSO4</b>	Better understanding of real life situation: The ability to apply sociological concepts and theories to the real world and ultimately their everyday lives.
<b>PSO5</b>	Analytical thinking: Field survey and preparation of dissertation paper is an inseparable part of Sociology Hons Programme. Students have to collect primary data for census as well as his/her research topic and analyse the data to draw conclusions. So, qualitative and quantitative analytical skills are enhanced.
<b>PSO6</b>	Observation power: a sensible observation power is necessary to identify the research problems in field study. So a perception about human society slowly grows up.
<b>PSO7</b>	Communication skills and Social interaction power: Students of Sociology stream have to work beyond the class room boundary at the time of field study activities. As a result good communication skill develops while interacting with local people.
<b>PSO8</b>	Ethical and Social Responsibility: Students have to learn about institutions, folkways , mores, culture, social control ,social inequality, population composition, population policy, society and culture of India. All these help to instil among the students of Sociology a sense of ethical and social responsibility.
<b>PSO9</b>	Professional and Career Opportunities: Students will have the opportunity to join professional careers in Sociology and allied fields. Sociology provides an intellectual background for students considering careers in business, social services, public policy, government service, nongovernmental organizations, foundations, or academia. This programme lays foundation for further study in Sociology, Social work, Rural Development, Social Welfare and in other allied subjects.

## **C) COURSE OUTCOMES**

## **SEMESTER – I**

### **Core – I (INTRODUCTION TO SOCIOLOGY)**

<b>CO1</b>	Sociology: Definition and subject matter, nature and scope.
<b>CO2</b>	Basic Concepts: Society, culture, community, institutions, etc.
<b>CO3</b>	Individual and Society: Individual and Society, socialization, stages and agencies of socialization, etc.
<b>CO4</b>	Social Stratification: Meaning and definition, dimensions of stratification, etc.
<b>CO5</b>	Social Control: Meaning and types, formal and informal social control, etc.

### **Core – II (INDIAN SOCIETY)**

<b>CO1</b>	Composition of Indian Society: Caste, Tribe, Religion, Language.
<b>CO2</b>	Hindu Social Organisation: Bases of Hindu Social Organisation, Varna, Ashrama and Purushartha. Doctrine of Karma.
<b>CO3</b>	Marriage and Family in India: Hindu marriage as Sacrament, forms of hindu marriage, etc.
<b>CO4</b>	The caste system in India: Origin, features and functions, caste and class, etc.
<b>CO5</b>	Social change in modern India: Sanskritization, westernization, secularization and modernization.

## **SEMESTER – II**

### **Core – III (SOCIOLOGICAL THOUGHT)**

<b>CO1</b>	Auguste Comte.
<b>CO2</b>	Herbert Spencer.
<b>CO3</b>	Karl Max.
<b>CO4</b>	Emile Durkheim.
<b>CO5</b>	Max Weber.

### **Core – IV (SOCIAL CHANGE AND DEVELOPMENT)**

<b>CO1</b>	Social Change.
<b>CO2</b>	Theories of Social Change.
<b>CO3</b>	Factors of Social Change.
<b>CO4</b>	Economic Growth and Social Development.
<b>CO5</b>	Models of Development.

## **SEMESTER – III**



### **Core – V (RESEARCH METHODOLOGY)**

<b>CO1</b>	Meaning and Significance of Social Research.
<b>CO2</b>	Research Design and Types of Research Design.
<b>CO3</b>	Hypothesis: Meaning, characteristics etc.
<b>CO4</b>	Qualitative Social Research.
<b>CO5</b>	Quantitative methods in Social Research.

### **Core – VI (GENDER AND SOCIETY)**

<b>CO1</b>	Social Construction of Gender.
<b>CO2</b>	Feminism: Meaning, origin and growth of Feminist Theories.
<b>CO3</b>	Gender and Development.
<b>CO4</b>	Status of Women in India.
<b>CO5</b>	Major Challenges and issues affecting Women in India.

### **Core – VII (RURAL SOCIOLOGY)**

<b>CO1</b>	Origin and Scope of Rural Sociology.
<b>CO2</b>	Rural social structure.
<b>CO3</b>	Rural social problems.
<b>CO4</b>	History of Evolution.
<b>CO5</b>	Rural Development Programmes.

## **SEMESTER – IV**

### **Core – VIII (GLOBALIZATION AND SOCIETY)**

<b>CO1</b>	Meaning and characteristics of globalization.
<b>CO2</b>	Dimensions of contemporary globalization.
<b>CO3</b>	Consequences of globalization.
<b>CO4</b>	Globalization and Indian Society.
<b>CO5</b>	Impact of globalization on religion, culture, education, family, marriage, women and tribes.

### **Core – IX (MARRIAGE, FAMILY AND KINSHIP)**

<b>CO1</b>	Theoretical perspectives.
<b>CO2</b>	Marriage.
<b>CO3</b>	The family.
<b>CO4</b>	Contemporary issues.
<b>CO5</b>	The kinship and clan system.

### **Core – X (SOCIAL DISORGANIZATION AND DEVIANCE)**

<b>CO1</b>	Social disorganization.
<b>CO2</b>	Theories of deviant behaviour.
<b>CO3</b>	Crime and punishment.
<b>CO4</b>	Social problems.
<b>CO5</b>	Atrocities against women, domestic violence, dowry and divorce.

## **SEMESTER – V**

### **Core – XI (POLITICAL SOCIOLOGY)**

<b>CO1</b>	State: Characteristics, Aristotle’s classification of types of state.
<b>CO2</b>	Influence, power and authority.
<b>CO3</b>	Political culture and political socialization.
<b>CO4</b>	Political participation.
<b>CO5</b>	Political parties and pressure groups.

### **Core – XII (ENVIRONMENT AND SOCIETY)**

<b>CO1</b>	Environment and its concepts.
<b>CO2</b>	Environmental issues.
<b>CO3</b>	Environmental movements.
<b>CO4</b>	Contemporary environmental problems.
<b>CO5</b>	Environment protection efforts at the global level and the national level in India.

### **DSE – I (SOCIOLOGY OF MOVEMENTS)**

<b>CO1</b>	Social movements.
<b>CO2</b>	Religious movements in India.
<b>CO3</b>	Peasants movements in India.
<b>CO4</b>	Backward class movements in India.
<b>CO5</b>	Women’s movements in India.

### **DSE – II (INDUSTRIAL SOCIOLOGY)**

<b>CO1</b>	Introduction: Meaning and definition of Industrial Sociology.
<b>CO2</b>	Social-Industrial thought.
<b>CO3</b>	The Development of Industry.
<b>CO4</b>	Industrial Organisation.
<b>CO5</b>	Industrial and labour relations.

## **SEMESTER – VI**

### **Core – XIII (URBAN SOCIOLOGY)**

<b>CO1</b>	Meaning, nature, scope and importance of Urban Sociology.
<b>CO2</b>	Theories of patterns of city growth.
<b>CO3</b>	Social institutions of Indian urban communities.
<b>CO4</b>	Urban social problems.
<b>CO5</b>	Urban development in India plans.

**Core – XIV (SOCIOLOGY OF SOCIAL INSTITUTIONS)**

<b>CO1</b>	Community, groups, institutions and organizations.
<b>CO2</b>	Family, marriage and kinship.
<b>CO3</b>	Religion.
<b>CO4</b>	Education.
<b>CO5</b>	Economy.

**DSE – III (POPULATION STUDIES)**

<b>CO1</b>	Population studies.
<b>CO2</b>	Population theories.
<b>CO3</b>	Population consumptions in India.
<b>CO4</b>	Population planning and policies.
<b>CO5</b>	Population control.

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**SALIPUR AUTONOMOUS COLLEGE, SALIPUR  
CUTTACK, Odisha-754202**

**PROGRAM OUTCOMES(POs), PROGRAM SPECIFIC OUTCOMES(PSO) AND  
COURSE OUTCOMES(COs)**

**SCIENCE FACULTY**

**1) CHEMISTRY**

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

<b>Programme Specific Outcomes</b>	<p>PSO-1. Gain the knowledge of Chemistry through theory and practical's.</p> <p>PSO-2. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.</p> <p>PSO-3. Identify chemical formulae and solve numerical problems.</p> <p>PSO-4. Use modern chemical tools, Models, Chem-draw, Charts and Equipments.</p> <p>PSO-5. Know structure-activity relationship.</p> <p>PSO-6. Understand good laboratory practices and safety. PSO-7. Develop research oriented skills.</p> <p>PSO-8. make aware and handle the sophisticated instruments/equipments.</p>
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## Course Outcomes

After completion of these courses students should be able to;

CO-1. Write an expression for rate constant K for third order reaction

CO-2. Solve the numerical problems based on Rate constant

CO-3. Understand the term specific volume, molar volume and molar refraction

CO-4. Know the meaning of phase, component and degree of freedom and derive the expression for rotational spectra for the transition from J to J+1

CO-5. Know the meaning of various terms involved in co-ordination chemistry

CO-6. To understand Werner's formulation of complexes and identify the types of valences

CO-7. Know the limitations of VBT

CO-8. Know the shapes of d-orbital's and degeneracy of d-orbital's and draw the geometrical and optical isomerism of complexes

CO-9. Define organic acids and bases.

CO-10. Distinguish between geometrical and optical isomerism.

CO-11. Discuss kinetics, mechanism and stereochemistry of  $SN^1$  and  $SN^2$  reactions.

CO-12. Compare between  $E_1$  and  $E_2$  reactions.

CO-13. Understand the evidences, reactivity and mechanism of various elimination and substitution reactions.

CO-14. Know the principles of common ion effect and solubility product and study the methods of thermo-gravimetric analysis.

CO-15. Understand the principles of Spectro-photometric analysis and properties of electromagnetic radiations.

CO-16. Study the Voltammetry and Polarography as an analytical tool and measure the absorbance of atoms by AAS.

CO-17. Know the importance of chemical industry and classify various insecticides.

CO-18. Study the nutritive aspects of food constituents.

CO-19. Understand the characteristics of some food starches and study the manufacture of cement, dyes, Glass, Soap and detergents by modern methods.

CO-20. Know the role of agriculture chemistry and its potential

CO-21. Understand the basic concept of soil, properties of soil & its classification on the basis of pH.

CO-23. Know the different plant nutrients, their functions and deficiency symptoms.

CO-24. Identify the problematic soil and recommend a method for their reclamation.

CO-25. Have the knowledge of various pesticides, insecticides, fungicides and herbicides.

CO-26. Understand Mechanics of system of particles and know the Redox reaction.

CO-27. Study the Crystal Field Theory.

CO-28. Solve the cell reaction and calculate EMF and calculate interplanar distance.

CO-29. Understand De-Broglie hypothesis and Uncertainty principle

CO-30. Derive Schrödinger's time dependent and independent equations

CO-31. Study the electronic configuration of lanthanides and actinides and get knowledge of Crystalline solid.

CO-32. Understand different operation in stoichiometric molecule and study the Bio-inorganic chemistry.

CO-33. Understand the p-type semiconductor and n-type semiconductor.

CO-34. To study UV, IR and NMR spectroscopy.

CO-35. Discuss different types of rearrangement reactions.

CO-36. Determine structure of compound by spectroscopic methods and understand the difference between carbocation and carbanion.

CO-37. To study alkaloids, Ephedrine, citral molecule with their properties and application.

CO-38. Know the different analytical techniques.

CO-39. To understand different types of separation techniques and to study principle, construction and working of GC and HPLC and to give an extended knowledge about chromatographic techniques used for separation of amino acids.

CO-40. Discuss the problem based on distribution coefficient and extraction techniques.

- CO-41. Know the various pharmaceutical drugs, their application and synthesis.
- CO-42. To study the waste management.
- CO-43. To understand the function of dyes, paints and pigments.
- CO-44. To study the various type of surfactants.
- CO-45. To know about molasses and bagasse and to study the different types of polymer.
- CO-46. Know the market of milk in different breeds.
- CO-47. Understand the basic principle of sterilization, homogenization, and standardization of milk.
- CO-48. Study the flow sheet diagram of shrikhand powder, whey powder, and ice-cream.
- CO-49. Study the different nutrient value in milk.
- CO-50. Calculate molar and normal solution of various concentrations and determine specific rotations and percentage of to optically active substances by polarimetrically.
- CO-51. Study the energy of activation and second order reaction and study the stability of complex ion and stranded free energy change and equilibrium constant by potentiometry.
- CO-52. Find out the acidity, Basicity and PKa Value on pH meter.
- CO-53. Study the gravimetric and volumetric analysis of ores and alloy and prepare a various inorganic complexes and determine its % purity and to study binary mixture with removal of borate and phosphate.
- CO-54. To understand the chromatographic techniques
- CO-55. Perform the Binary mixtures.
- CO-56. Preparation of organic compounds, their purifications and run TLC.
- CO-57. Determination of physical constant: Melting point, Boiling point.
- CO-58. Different separation techniques.

## 2)PHYSICS

<b>Department of Physics</b>	After successful completion of three year degree program in physics a student should be able to;
<b>PROGRAM OUTCOMES</b>	PO-1. Demonstrate, solve and an understanding of major concepts in all disciplines of physics.
	PO-2. Solve the problem and also think methodically, independently and draw a logical conclusion.
	PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments.

	PO-4. Create an awareness of the impact of Physics on the society, and development outside the scientific community.
	PO-5. To inculcate the scientific temperament in the students and outside the scientific community.
	PO-6. Use modern techniques, decent equipments and Phonics software's

### **PROGRAM SPECIFIC OUTCOMES**

PSO-1.	Gain the knowledge of Physics through theory and practical's.
PSO-2.	Understand good laboratory practices and safety.
PSO-3.	Develop research oriented skills
PSO-4.	Make aware and handle the sophisticated instruments/equipments.

### **COURSE OUTCOMES**

CO-1. Know the Cartesian, spherical polar and cylindrical co-ordinate systems.

CO-2. To understand the Special Theory of Relativity.

CO-3. Discuss the Michelson- Morley Experiment.

CO-4 To obtain the series solution by Frobenius method .

CO-5 Study the Generating function for Legendre, Hermite polynomials.

CO-6. Know the principles of structures determination by diffraction

CO-7. To understand the principles and techniques of X-rays diffraction

CO-8. Know the fundamental principles of semiconductors and be able to estimate the charge carrier mobility and density

CO-9. To give an extended knowledge about magnetic properties like diamagnetic, paramagnetic, ferromagnetic, ferrites and superconductors.

CO-10. Understand Newton's Laws of motion and their applications such as projectile and rocket motion

CO-11. Gain the knowledge of motion in central force field

CO-12. Classify elastic and inelastic scattering

CO-13. Know the difference between Laboratory and centre of mass system

CO-14. Understands Lagrangian and Hamiltonian formulation

CO-15 Solve the problems using Lagrangian and Hamiltonian formulation



- CO-16 Get knowledge of canonical transformation and Poisson's bracket .
- CO-17. To know the Rutherford Experiment of atom.
- CO-18. To understand molecular spectra of atom.
- CO-19. To study the Raman spectra.
- CO-20. To study the Zeeman Effect.
- CO-21. To understand the Quantum Numbers.
- CO-22. Write algorithm and flow chart for c-programming language.
- CO-23. To use of iterative, decision making and the jump statement.
- CO-24. Understand the concept of arrays and pointers.
- CO-25. Study of user defined functions and program structures.
- CO-26. Able to use the concept graphics in c language.
- CO-27. To study the Mechanical, Electrical and Thermal Properties of material.
- CO-28. Discuss the type of Phase Diagrams.
- CO-29. Know the solid solution and types of solid solution.
- CO-30. Understanding the Point Defect, Line Defect with example.
- CO-31. Study the Diffusion Mechanism.
- CO-31. Know the difference between Elastic and Plastic Deformation.
- CO-32. To understand the Polymer Vulcanization of rubber.
- CO-33. Know the AX-type crystal structure – eg. NaCl, ZnS etc.
- CO-34. Understand Mechanics of system of particles.
- CO-35. Know the Motion in Central Force Field.
- CO-36 Elastic and inelastic scattering.
- CO-37. Solve Lagrangian and Hamiltonian formulation.
- CO-38. Learn Canonical Transformation and Poisson's Bracket.
- CO-39. Understand De-Broglie hypothesis and Uncertainty principle.
- CO-40. Derive Schrödinger's time dependent and independent equations
- CO-41. Solve the problems using Schrödinger's steady state equation
- CO-42. Get knowledge of rigid rotator
- CO-43. Understand different operators in Quantum Mechanics.
- CO-44. To study kinetic theory of Gases.
- CO-45. To study Maxwell Relations and Application.
- CO-46. Know the elementary concept of statistics.
- CO-47. Understand statistical distribution of system of particles.
- CO-48. To study statistical ensembles.
- CO-49. To study Quantum statistics.
- CO-50. Know the properties of nucleus like binding energy, magnetic dipole moment and

electric quadruple moment

CO-51. To understand the concept of radioactivity and decays law

CO-52. To study achievement of Nuclear Models of Physics and its limitations

CO-53. To give an extended knowledge about nuclear reactions such as nuclear fission and fusion

CO-54. To understand the basic concept of Particle Physics.

CO-55. Know the special purpose Diode.

CO-56. To study the Transistor Amplifier.

CO-57. To understand the FET, JFET, MOSFET.

CO-58. To study the Operational Amplifier and their types.

CO-

59. To know the Timer IC- 555 and its classification.

CO-

60. To study the Regulated Power supply.

CO-61. To understand the Sequential Logic Circuits.

CO-62. Know the history of LASERS and its basic concepts.

CO-63. Understand the basic principle and working of different types of lasers.

CO-64. Know the applications of lasers in various fields.

CO-65. Understand the characteristics of LASERS.

CO-66. Learn safety precaution and measures while handling the lasers.

### 3) MATHEMATICS

#### PROGRAM OUTCOMES

PO1.	Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.
PO2.	A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.
PO3.	Ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.
PO4.	Introduction to various courses like group theory, ring theory, field theory, metric spaces, number theory.
PO5.	Enhancing students' overall development and to equip them with mathematical modelling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.
PO6.	Ability to pursue advanced studies and research in pure and applied mathematical science.

## PROGRAM SPECIFIC OUTCOMES

PSO1.	Think in a critical manner.
PSO2.	Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
PSO3.	Formulate and develop mathematical arguments in a logical manner.
PSO4.	Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.
PSO5	.Understand, formulate and use quantitative models arising in social science, Business and other context.

## COURSE OUTCOMES

- CO1. Learn to solve system of linear equation.
- CO2. Learn to solve Diophantine equation.
- CO3. Learn to find roots of polynomial over rational.
- CO4. Learn to find graphs, roots and primes integer using maxima software.
- CO5. Introduction to complex analysis.
- CO6. Gain Knowledge of fundamental concepts of real numbers.
- CO7. Verify the value of the limit of a function at a point using the definition of the limit
- CO8. Introduction to sequence and series.
- CO9. Learn to check function is continuous understand the consequences of the intermediate value theorem for continuous functions.
- CO10. Learn Maxima software.
- CO11. Problem solve on algebra and calculus by using maxima software.
- CO12. Knowledge of application of mathematics
- CO13. Introduction to analytical geometry of 2 dimensional.
- CO14. Study of lines in 2 and 3 dimension.
- CO15. Finding equation in various form of line, circle, ellipse, sphere, cones etc.
- CO16. Give the knowledge of geometry using maxima software.
- CO17. Student will be to understand differentiation and fundamental theorem in differentiation and various rules.
- CO18. Geometrical representation and problem solving on MVT and Rolls theorem.
- CO19. Finding extreme values of function.
- CO20. Introduction to Ordinary Differential Equation.
- CO21. Learn Maxima software.
- CO22. Problem solve on analytic geometry and calculus by using maxima software.
- CO23. Problem solving on geometry and calculus.
- CO24. Gain Knowledge of fundamental concepts of real numbers in n dimensions.  
verify the value of the limit of a function at a point using the definition of the limit in  $\mathbb{R}^n$
- CO25. Find the extreme value in 2 dimensions.
- CO26. Study multiple integration.
- CO27. To understand logical concepts and to show logical equivalences by using truth tables and rules in logics.

- CO28. Learn concept related to counting.
- CO29. Introduction to advanced counting.
- CO30. Problem solving on multivariable calculus and discrete mathematics.
- CO31. Introduction to application of mathematics in real life.
- CO32. Learn to build logical concept.
- CO33. Introduction to vector space and subspace.
- CO34. Use computational techniques and algebraic skills essential for the study of systems of
- CO35. Linear equations, matrix algebra, vector spaces, eigen values and eigenvectors,
- CO36. Orthogonality and Diagonalization.
- CO37. To apply appropriate numerical methods to solve the problem with most accuracy.
- CO38. Using appropriate numerical methods determine approximate solution of ODE and system of linear equation.
- CO39. Compare different methods in numerical analysis w.r.t accuracy and efficiency of solution.
- CO40. To demonstrate used of interpolation method in numerical analysis.
- CO41. Use computational techniques and algebraic skills essential for the study of systems of  
Linear equations, matrix algebra, vector spaces, eigen values and eigenvectors, Orthogonality and Diagonalization.
- CO42. Able to understand the Euclidean distance function on  $\mathbb{R}^n$  and appreciate its properties, and state and use the Triangle and Reverse Triangle Inequalities for the Euclidean distance function on  $\mathbb{R}^n$  Explain the definition of continuity for functions from  $\mathbb{R}^n$  to  $\mathbb{R}^m$  and determine whether a given function from  $\mathbb{R}^n$  to  $\mathbb{R}^m$  is continuous
- CO43. Explain the geometric meaning of each of the metric space
- CO44. Distinguish between open and closed balls in a metric space
- CO45. Define convergence for sequences in a metric space and
- CO46. Determine whether a given sequence in a metric space converges
- CO47. Describe fundamental properties of the real numbers that lead to the formal development of real analysis.
- CO48. Comprehend rigorous arguments developing the theory underpinning real analysis.
- CO49. Demonstrate an understanding of limits and how they are used in sequences, series,
- CO50. Construct rigorous mathematical proofs of basic results in real analysis
- CO51. Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
- CO52. Problem solving on metric space and connected and contactless.
- CO53. Understand the importance of algebraic properties with regard to working within various number systems.
- CO54. Extend group structure to finite permutation groups (Caley Hamilton Theorem).  
Generate groups given specific conditions.
- CO55. Symmetry using group theory.
- CO56. Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.
- CO57. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases.

- CO58. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution.
- CO59. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
- CO60. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters.
- CO61. Demonstrate by solving various problem based on Symmetry using group theory
- CO62. Find quotients and remainders from integer division
- CO63. Apply Euclid's algorithm and backwards substitution
- CO64. Understand the definitions of congruence, residue classes and least residues add and subtract integers, modulo  $n$ , multiply integers and calculate powers, modulo  $n$
- CO65. Determine multiplicative inverses, modulo  $n$  and use to solve linear congruence.
- CO66. Theory of quadratic residue
- Develop linear programming (LP) models for shortest path, maximum flow, minimal spanning tree, critical path, minimum cost flow, and transshipment problems.
- CO67. Understand the mathematical tools that are needed to solve optimization problems.
- CO68. Formulate pure, mixed, and binary integer programming models.  
Formulate the nonlinear programming models.  
Use some solution methods for solving the nonlinear optimization problems.
- CO69. Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering
- CO70. Understand the definitions of congruence, residue classes and least residues add and subtract integers, modulo  $n$ , multiply integers and calculate powers, modulo  $n$
- CO71. Application based on Diophantine and Chinese remainder theorem and operational research. Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers · Define and analyze limits and continuity for complex functions as well as consequences of continuity Conceive the concepts of analytic functions and will be familiar with the elementary complex functions and their properties ·
- CO72. Determine whether a given function is differentiable, and if so find its derivative. Applies the theory into application of the power series expansion of analytic functions · Understand the basic methods of complex integration and its application in contour integration. · Analyze sequences and series of analytic functions and types of convergence, ·
- CO73. Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula.
- CO74. Understand Integrability and theorems on integrability. Recognize the difference between point wise and uniform convergence of a sequence of functions.  
Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability.
- CO75. Study improper integration using Riemann integration.  
Applies the theory into application of the power series expansion of analytic functions · CO76.  
Understand the basic methods of complex integration and its application in contour integration. ·

- CO77. To analyze sequences and series of analytic functions and types of convergence, Evaluate complex contour integrals directly and by the fundamental theorem, apply the CO78. Cauchy integral theorem in its various versions, and the Cauchy integral formula  
Solve improper integration using Riemann integration.  
Solve problem on convergence of function.
- CO79. Students will be able to define ring and subrings.  
Study of ideals and concept related to ideal.  
Study of various integral domain in ring.
- CO80. Introduction to field.  
Be familiar with the modeling assumptions and derivations that lead to PDEs.  
Recognize the major classification of PDEs and the qualitative differences between the classes of equations.
- CO81. Be competent in solving linear PDEs using classical solution methods.  
Problem on ring and PDE.  
Application of PDE in real life.
- CO82. Various structural study of ring.  
Students will be able to understand two dimensional transformations.
- CO83. Students will be able to understand three dimensional transformations.  
To get acquainted with typical problem on CG and existence solution.
- CO84. Introduction to projection and its types. Bezier curves.  
Understand and apply the concept of optimality criteria for various type of optimization problems.
- CO85. Solve various constrained and unconstrained problems in single variable as well as multivariable. Solve simple games using various techniques ·
- CO86. Analyze economic situations using game theoretic techniques ·  
Recommend and prescribe which strategies to implement
- CO87. Problem solving on CG & OT.  
Application of projection in real life.
- CO88. Solve optimal real life problem based on supply and demands.  
Solve simple games using various techniques ·
- CO89. Analyze economic situations using game theoretic techniques ·  
Recommend and prescribe which strategies to implement.

#### 4)BOTANY

##### PROGRAM OUTCOME

<b>PO1.</b>	Knowledge and understanding of: 1. The range of plant diversity in terms of structure, function and environmental relationships. 2. The evaluation of plant diversity. 3. Plant classification and the flora of Maharashtra. 4. The role of plants in the functioning of the global ecosystem. 5. A selection of more specialized, optional topics. 6. Statistics as applied to biological data.
<b>PO2.</b>	<b>Intellectual skills – able to:</b> 1. Think logically and organize tasks into a structured form. 2. Assimilate knowledge and ideas based on wide reading

	and through the internet. 3. Transfer of appropriate knowledge and methods from one topic to another within the subject. 4. Understand the evolving state of knowledge in a rapidly developing field. 5. Construct and test hypothesis. 6. Plan, conduct and write a report on an independent term project.
PO3.	<b>Practical skills:</b> Students learn to carry out practical work, in the field and in the laboratory, with minimal risk. They gain introductory experience in applying each of the following skills and gain greater proficiency in a selection of them depending on their choice of optional modules. 1. Interpreting plant morphology and anatomy. 2. Plant identification. 3. Vegetation analysis techniques. 4. A range of physiochemical analyses of plant materials in the context of plant physiology and biochemistry. 5. Analyze data using appropriate statistical methods and computer packages. 6. Plant pathology to be added for sharing of field and lab data obtained.
PO4.	<b>Transferable skills:</b> 1. Use of IT (word-processing, use of internet, statistical packages and databases). 2. Communication of scientific ideas in writing and orally. 3. Ability to work as part of a team. 4. Ability to use library resources. 5. Time management. 6. Career planning.
PO5.	<b>Scientific Knowledge:</b> Apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form.
PO6.	<b>Problem analysis:</b> Identify the taxonomic position of plants, formulate the research literature, and analyze non reported plants with substantiated conclusions using first principles and methods of nomenclature and classification in Botany.

### PROGRAM SPECIFIC OUTCOMES

PSO1.	Design solutions from medicinal plants for Health problems, disorders and disease of human beings and estimate the phytochemical content of plants which meet the specified needs to appropriate consideration for the public health.
PSO2	. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and development of the information to provide valid conclusions.
PSO3.	Create, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations.
PSO4.	Apply reasoning informed by the contextual knowledge to assess plant diversity, its importance for society, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice.
PSO6.	Apply ethical principles and commit to environmental ethics and responsibilities and norms of the biodiversity conservation.

PSO7.	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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## **COURSE OUTCOMES**

1. Understand the diversity among Algae.
2. Know the systematic, morphology and structure, of Algae. Understand the life cycle pattern of Algae.
3. Understand the useful and harmful activities of Algae.
4. Understand the Biodiversity of Fungi
5. Know the Economic Importance of Fungi
6. Understand the morphological diversity of Bryophytes.
7. Understand the economic importance of the Bryophytes.
8. Understand the Biochemical nature of cell.
9. Know the chemical nature of biomolecules.
10. Understand the different types of interaction in Biomolecules.
11. Structure and general features of enzymes.
12. Concept of enzyme activity and enzyme inhibition.
13. Learn about the movement of sap and absorption of water in plant body.
14. Understand the plant movements.
15. Understand the morphological diversity of Bryophytes and Pteridophytes and Gymnosperms.
16. Understand the economic importance of the Bryophytes and Pteridophytes and Gymnosperms.
17. Know the evolution of Bryophytes and Pteridophytes and Gymnosperms.
18. Understand the habit of the angiosperm plant body.
19. Know the vegetative characteristics of the plant.
20. Learn about the reproductive characteristics of the plant.
21. Understand the plant morphology and basic taxonomy.
22. The eukaryotic cell cycle and mitotic and meiotic cell division
23. Structure and organization of cell membrane
24. Process of membrane transport and membrane models
25. Mendelian and Neo-mendelian genetics
26. To study the phenomenon of dominance, laws of segregation, independent



assortment of genes.

27. To understand the different types of genetic interaction, incomplete dominance, codominance, inter allelic genetic interactions, multiple alleles and quantitative inheritance etc.
28. Understand the diversity among Algae.
29. Know the systematic, morphology and structure, of Algae.
30. Understand the life cycle pattern of Algae.
31. Understand the useful and harmful activities of Algae.
32. Understand the Biodiversity of Fungi
33. Know the Economic Importance of Fungi
34. Understand the morphological diversity of Bryophytes.
35. Understand the economic importance of the Bryophytes.
36. Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes.
37. Become aware of applications of different plants in various industries.
38. To highlight the potential of these studies to become an entrepreneur.
39. To equip the students with skills related to laboratory as well as industries based studies
  
40. Know importance and scope of plant physiology.
41. 2Understand the plants and plant cells in relation to water.
42. Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C<sub>3</sub> and C<sub>4</sub> pathways.
43. Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
44. Learn about the movement of sap and absorption of water in plant body
45. Understand the plant movements.
46. Know the scope and importance of the discipline.
47. Understand plant communities and ecological adaptations in plants.
48. Know the concept of methodology in taxonomy.
49. Learn about conservation of biodiversity, Non-conventional Energy and Pollution.
50. Discover botanical regions of India and vegetation types of Maharashtra.
51. Understand Bioremediation, Global warming and climate change.
52. On completion of the course, students are able to:
53. Gain knowledge about “Cell Science”.
54. Understand Cell wall Plasma membrane, Cell organelles and cell division.

55. Learn the scope and importance of molecular biology.
56. Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material.
57. Understand the process of synthesis of proteins and role of genetic code in polypeptide formation.
58. Understand the role plants in human welfare.
59. Gain knowledge about various plants of economic use.
60. Know importance of plants & plant products.
61. Understand the chemical contents of the plant products.
62. Know about the utility of plant resources.
63. Understand the diversity among Algae.
64. Know the systematic, morphology and structure, of Algae.
65. Understand the life cycle pattern of Algae.
66. Understand the useful and harmful activities of Algae.
67. Understand the Biodiversity of Fungi
68. Know the Economic Importance of Fungi
69. Understand the morphological diversity of Bryophytes.
70. Understand the economic importance of the Bryophytes.
71. Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes.
72. Know the scope of Paleobotany, types of fossils, its role in global economy and geological time scale.
73. Understand the various fossil genera representing different fossil groups.
74. Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material.
75. Understand the process of synthesis of proteins and role of genetic code in polypeptide formation.
76. Know the details of Microscopy- Principles of light microscopy, electron microscopy (TEM and SEM).
77. Understand & perform Chromatography and cultural techniques in Botany.
78. Understand the methods used in Micrometry, Microtomy and Microphotography.
79. Learn and understand about mineral nutrition in plants.
80. Understand the growth and developmental processes in plants.
81. Know about Photosynthesis and Respiration in plants.
82. Understand the process of translocation of solutes in plants
83. Know the nitrogen metabolism and its importance.

84. Understand the properties of Monosaccharides, Oligosaccharides and Polysaccharides.
85. They will learn about the Significance of Carbohydrates.
86. Understand the Properties of saturated fatty acids, and unsaturated fatty acids.
87. Understand lipid metabolism in plants.
88. Understand the Beta Oxidation, Gluconeogenesis and its role in mobilization of fatty acids during germination.
89. They will learn about the Significance of lipids.
90. They will be able to understand Brief outline of biosynthesis of amino acid.
91. Understand the protein - structure and classification and protein biosynthesis in prokaryotes and eukaryotes.
92. They will learn about the nucleic acid metabolism.
  
93. Understand the diversity of Gymnosperms in India
94. Know the evolutionary trends and affinities of living gymnosperms with respect to external and internal features
95. Know the conceptual development of „taxonomy“ and „systematics“
96. Understand the Phylogeny of angiosperms -A general account of the origin of Angiosperms.
97. Understand the general range of variations in the group of angiosperms.
98. Trace the history of development of systems of classification emphasizing angiospermic taxa.
99. To learn the wide activities in angiosperm and trends in classification.
100. Learn about the characters of biologically important families of angiosperms.
101. Know the floral variations in angiospermic families, their phylogeny and evolution.
102. Understand various rules, principles and recommendations of plant nomenclature produces in plant identification.
103. Understand major evolutionary trends in various parts of angiospermic plants
104. Know the methods of pollination and fertilization.
105. Know fertilization, endosperm and embryogeny.
106. Understand the scope & importance of Anatomy.
107. Know various tissue systems.
108. Understand the normal and anomalous secondary growth in plants and their causes.
109. Perform the techniques in anatomy.
110. With respect to recent knowledge students should know about the different tools in the taxonomy so as to relocate the phylogenetic position of plant or taxa.

111. Understand the concept, principle and types of sterilization methods.
112. Know the concept and characteristics of antiseptic, disinfectant and their mode of action.
113. Know the cultivation methods of bacteria, yeast, fungi and virus.
114. Principle, working and applications of instruments viz, pH meters, spectrophotometer, centrifuge, viscometer, and laminar air flow.
115. Understand the Microbial Genetics and Recombination in Bacteria.
116. Know the terminologies in plant pathology.
117. Understand the scope and importance of Plant Pathology.
118. Know the prevention and control measures of plant diseases and its effect on economy of crops.
119. Understand the science of plant breeding.
120. To introduce the student with branch of plant breeding for the survival of human being from starvation.
121. To study the techniques of production of new superior crop varieties.
122. Understand the modern strategies applied in Genetics and Plant Breeding to sequence and analyze genomes
123. Get the detail knowledge about modern strategies applied in Plant Breeding for crop improvement i.e. Mass selection, Pureline Selection and Clonal selection.
124. Know about exploitation of Heterosis, hybrid and variety development and their release through artificial hybridization.
125. Understand the role plants in human welfare.
126. Gain knowledge about various plants of economic use.
127. Know importance of plants & plant products.
128. Understand the chemical contents of the plant products.
129. Know about the utility of plant resources.
130. Know about the genomic organization of living organisms, study of genes genome, chromosome etc.
131. Gain knowledge about the mechanism and essential component required for prokaryotic DNA replication.
132. Understand the fundamentals of Recombinant DNA Technology.
133. Know about the Genetic Engineering.
134. Understand the principle and basic protocols for Plant Tissue Culture.
135. The concept of operon and its structure and regulation.

## 5) ZOOLOGY PROGRAM OUTCOMES

PO-1.	Demonstrate, solve and an understanding of major concepts in all disciplines of Zoology.
PO-2	. Solve the problem and also think methodically, independently and draw a logical conclusion.
PO-3.	Understand the evolution, history of phylum.
PO-4.	Create an awareness of the impact of Zoology on the environment, society, and development outside the scientific community.
PO-5.	To study and understand the classification of whole phyla includes in Non chordates with the help of charts/models/pictures.
PO-6.	To inculcate the scientific temperament in the students and outside the scientific community.
PO-7.	Use modern techniques, decent equipments and Zoology software"s

### PROGRAM SPECIFIC OUTCOMES

PSO-1.	Gain the knowledge of Zoology through theory and practical"s.
PSO-2.	Study and understand the DNA Recombinant technology.
PSO-3.	Understand the testing of hypothesis.
PSO-4.	Use modern Zoological tools, Models, Charts and Equipments.
PSO-5.	Know structure-activity relationship.
PSO-6.	Understand good laboratory practices and safety.
PSO-7.	Develop research oriented skills.
PSO-8.	Make aware and handle the sophisticated instruments/equipments.

### COURSE COUTCOMES

CO-1 Understand the evolution, history of phylum.

CO-2 Understand about the Non Chordate animals.

CO-3 To study the external as well as internal characters of non chordates.

CO-4 To study the distinguishing characters of non chordates.

CO-5 Understand the economical importance of Molluscs

CO-6 Understand the various internal systems like Digestive system, nervous system with the help of charts.

CO-7 Understand the functions of Gemmules and spicules.

CO-8 Understand the economical importance of Molluscan shells.

- CO-9. Understand the terms Histology and Physiology
- CO-10. Understand the cell, tissue, organ, system and organisms.
- CO-11. Study the derivatives of skin- horns, nails, hairs.
- CO\_12. Study and understand the terms- acidosis, alkalosis, asphexia, hypoxia, anoxia and cyanosis.
- CO-13. Understand about the agencies responsible for Production of various products using biochemistry.
- CO-14. Understand the term pH, Buffer.
- CO-15. Understand the structure and function of carbohydrate, amino acids, proteins, and lipids.
- CO-16. Understand the concept Enzymes and also Vitamins and minerals.
- CO-17. Understand the Principle role of Vitamins in metabolism and Deficiency diseases.
- CO-18. Know the biotic and abiotic components of ecosystem.
- CO-19. Food chain & food web in ecosystem.
- CO-20. Understand diversity among various groups of animal kingdom.
- CO-21. Understand Animal community & ecological adaptation in animals.
- CO-22. Scope, importance and management of biodiversity
- CO-23. To study and understand the scope and branches of Medical Zoology.
- CO-24. To aware the students for various parasites and diseases which spreads in human with the help of study of host-parasite relationship.
- CO-25. To increase awareness for the health in students.
- CO-26. Understand the various disease causing vectors like Mosquitoes. CO-
27. To aware about the typhoid, cholera like disease.
- CO-28. Understand the importance of medical diagnostic and also understand the term forensic Entomology
- CO-29. Understand the Scope of cell biology, because cell is the basic unit of life.
- CO-30. Understand the Main distinguishing characters between plant cell and animal cell.
- CO-31. To study and understand the whole cell organelles with their structure and function.
- CO-32. Understand the cell cycle and know the importance of various cells in body of organisms.
- CO-33. Understand the various applications of cells by using cell biology like study of various types of tumour.
- CO-34. Understand the Animal cells and various cell organelles by using microphotographs.
- CO-35. Understand the various Applications of Biotechnology.
- CO-36. Study and Understand the Hybridoma technology as well as Enzyme biotechnology.
- CO-37. Study and understand the DNA Recombinant technology.
- CO-38. Understand the industrial and environmental biotechnology.
- CO-39. Study and understand the Stem cell biotechnology.
- CO-40. Understand the Scope and Significance of Biotechnology.
- CO-41. Understand the Importance of physiology and branches of it.
- CO-42. Understand the terms-Osmosis, diffusion, pH and Buffer.
- CO-43. Understand the Digestion and Excretion process, by studying the Organs of it
- CO-44. Understand the process of Metabolism.
- CO-45. Understand the term Detoxification.

- CO-46. Understand the Circulatory system and Lymphatic system.
- CO-47. Study the nervous system.
- CO-48. Understand the Molecular biology and molecular biology.
- CO-49. Understand the cell divisions and types of mutation.
- CO-50. Understand the structure and function of the cells.
- CO-51. Understand the term cell signalling.
- CO-52. Aware the students for Cancer.
- CO-53. Understand the Tools and Techniques in Molecular Biology.
- CO- 54. Understand the term ELISA technique and DNA finger printing.
- CO-55. To understand Origin of life with respect to prokaryotic and eukaryotic cells.
- CO-56. Understand the evidences of organic evolution by anatomical embryological list, paleontological, physiological, genetics and molecular biology evidences.
- CO-57. Understand theories of organic evolution, isolation, speciation. CO-
58. Understand geological time scale, methods and classification of animal distribution and factors affecting animal distribution.
- CO-59. Understand the terms: Gametogenesis, Fertilization and early development.
- CO- 60. Understand the Morphogenesis and Organogenesis in animals. CO-
61. Understand the Aging, Apoptosis and Senescence.
- CO-62. Understand the fundamentals of agricultural, forest, medical and veterinary entomology.
- CO-63. Understand, Morphology and Anatomy of Insects.
- CO-64. Understand intra specific and inter specific relationships among insects.
- CO-65. To understand significance of beneficial and harmful insects with reference to their habit and habitat, life cycle, diseases caused by them and their control measures.

## 6) STATISTICS

### PROGRAM OUTCOMES

When the student joins college after school they are free to make their own choices which are very instrumental in changing their attitude towards life and society. It is very important to give them an appropriate and conducive environment to learn and grow. After completion of the degree apart from his/her specialty in the program of his/her choice the student learns a lot during their three year stay that makes them mature enough to take the right decisions at the right time. Students develop analytical thinking and good communication skills during classroom teaching (through projects/presentation/practical) and also as they participate in various activities both at departmental as well as college level.

Being a Central University, the student gets a chance to communicate with students of other states of India which makes them culturally sensitive and socially interactive.

As part of various departmental /college seminars and workshops he learns to respect and protect the environment. These programs also help in generating gender sensitization and building of ethical values to become a responsible citizen when he/she graduates from the college.

### PROGRAM SPECIFIC OUTCOMES

Statistics is the language of the uncertainties riddled modern information age. This program

is a compact combination of detailed courses of Statistics and adequate amount of courses on Computer Science, Mathematics and Operations research to complement and offer diversification after the completion of program. The thrust of the program is to provide a platform for pursuing higher studies leading to post-graduate or doctorate degrees. Along with this students are equipped with skill enhancement courses like Research methodology, Statistical packages and R language. Apart from this there is a range of Generic electives courses in Economics, Commerce, Computer Science etc. which students choose as per their interest and aptitude. This enhances theoretical rigor with technical skills which prepare students to become globally competitive to enter into a promising professional life even after graduation.

This program offers a range of traditional avenues in academics, Govt. Service, IAS, Indian Statistical/ Economic Services, Industries, Commerce, Investment Banking, Banks and Insurance Sectors, CSO and NSSO, Research Personnel/Investigator in Govt. organizations such as NCAER, IAMR, ICMR, Statistical and Economic Bureau & various PSUs., Market Research, Actuarial Sciences, Biostatistics, Demography etc. It also provides an array of non-traditional employment avenues ranging from Stock Brokers Analyst, Sports Analyst, Poll Analyst, Business Analyst, Financial Analyst, Content Analyst etc.

## **COURSE OUTCOMES**

### **Descriptive Statistics**

The learning objectives include summarizing the data and to obtain its salient features from the vast mass of original data.

After completing this course, the students should have developed a clear understanding of

- Concepts of statistical population and sample, variables and attributes.
- Tabular and graphical representation of data based on variables.
- ‘Conditions for the consistency’ and criteria for the independence of data based on attributes.
- Measures of central tendency, Dispersion, Skewness and Kurtosis.
- Moments and their use in studying various characteristics of data.
- Different approaches to the theory of probability.
- Important theorems on probability and their use in solving problem
- Concept of correlation, various correlation coefficients- Pearson’s correlation coefficient, Spearman’s rank correlation coefficient, partial correlation coefficient and Multiple correlation coefficient.
- Concept of Principle of least squares for curve fitting and regression lines.

### **Calculus**

Calculus is versatile and Valuable tool for the statistics. Calculus being used in statistics involves integrating over sections of a probability distribution. The content of this paper involves differential calculation, integral calculus and solution of different differential equations which are extremely prevalent in more advanced statistical application.

### **Probability and Probability Distributions**

A probability distribution is a statistical model that shows the possible outcomes of a particular event or course of action as well as the statistical likelihood of each event. Probability distribution functions are quite important and widely used in actuarial science



(insurance), engineering, physics, evolutionary biology, computer science and even social sciences such as psychiatry, economics and even medical trials.

### **Algebra**

Algebra is one of the most important courses in the field of statistical computing. The course serves as a building block that will enable students to learn more advanced techniques that will help them to solve problems more quickly and easily.

After completing course, students should have developed a clear understanding of:

- Theory of equations
- Properties of matrices and determinants
- Linear equations
- Rank of a matrix
- Generalized inverse
- Characteristics roots and vectors
- Quadratic forms

. The students will be conversant for their potential studies of Markov chain & stochastic process, Multivariate analysis, Regression analysis, Design of Experiments.

### **Sampling Distribution**

1. To understand the concept of sampling distributions and their applications in statistical inference.
2. To understand the process of hypothesis testing and its significance
3. Importance of Standard Error and to draw conclusions using p-value

### **Survey Sampling and Indian Official Statistics**

Survey Sampling provides the tolls/ techniques for selecting a sample of elements from a target population keeping in mind the objectives and nature of population. Most of the research work is done through Sample Survey. The students are able to know about Indian Official Statistical System.

After completing the course, students should have developed clear understanding of:

- Basic concepts of survey sampling
- Principles of survey sampling and main steps involved in selecting a sample
- Simple random sampling
- Stratified random sampling
- Systematic sampling
- Ratio and Regression method of estimation
- Cluster sampling (equal cluster size)
- Concepts of sub sampling
- Indian Official Statistical System

## **Mathematical Analysis**

### Numerical Analysis:

Theory of finite differences deals with the changes that take place in the value of the dependent variable due to finite changes in the independent variable.

On completion of the course, students should have achieved the following

- 1) Mathematical Operators ( Forward and Backward difference operators , Shift Operator ,Central difference operator ,Derivative)
- 2) Approximating a given set of data by a function using interpolation formula.
- 3) Newton Gregory interpolation formula (forward and backward) for arguments at equal intervals
- 4) Newton's Divided difference interpolation formula and Lagrange's interpolation formula( for unequal intervals)
- 5) Central Difference interpolation formula(Gauss and Sterling's)
- 6) Representation of a polynomial in factorial Notation
- 7) Numerical Quadrature using the interpolation formula( Trapezoidal Rule, Simpson's 1/3<sup>rd</sup> and 3/8<sup>th</sup> quadrature formula
- 8) Solution of Difference equations

### Real Analysis:

Students will have the knowledge of basic properties of the field of real numbers, the knowledge of the series of real numbers and convergence, Bolzano –Weirstrass theorem, Cauchy criteria, the knowledge of real functions-limits of functions and their properties, notion of continuous functions and their properties and the differentiability of real functions and related theorems

### **Statistical Inference**

Statistical inference: Drawing conclusions about the whole population on the basis of a sample.

Statistical inference is the process of deducing properties of an underlying probability distribution by analysis of data. Inferential statistical analysis infers properties about a population, this includes testing hypotheses and deriving estimates.

### **Linear Models**

The learning objectives includes developing a clear understanding of the fundamental concepts of linear models and a range of associated skills allowing the students to work effectively with them. The linear models are useful both in the planning stages of research and in the analysis of resulting data. The combination of theory and applications will prepare students to explore the course & more correctly interpret the output from linear model computer package.

After completing the course students should have developed clear understanding of:

- Basic concepts of linear models. Theory and estimation of linear models
- Gauss Markov Theorem and its use
- Fitting of these models, derivation of confidence interval, testing the hypothesis and interpretation of results
- Simple and multiple linear regression models and their applications
- Distribution of Quadratic Forms
- Techniques of analysis of variance and covariance for fixed effect models
- Concepts of residuals and outliers.

### **Stochastic Processes and Queuing Theory**

After completing this course, students should have developed a clear understanding of

- 1) The fundamental concepts of stochastic processes
- 2) Tools needed to analyze stochastic processes
- 3) Markov chains
- 4) Stability of Markov chains
- 5) Poisson process and its variations
- 6) Queuing systems
- 7) Random walk and ruin theory
- 8) To identify the real life applications of stochastic processes

### **Statistical Computing Using C/C++ Programming**

1. In this course students learn to write code in C to do statistical computing and its role in problem solving. C is a powerful, structured programming language widely used in all areas of study.
2. Student will understand basic data structures and develop logics which will help them to create well-structured programs using C language. It develops the analytical as well as logical thinking of the student.
3. It also opens the adaptability to learn any other programming language and using computer languages/software as a tool to analyze data statistically.

### **Design of Experiments**

DOE is a tool to develop an experimentation strategy that maximizes learning using a minimum of resources. Extensively used by engineers and scientists involved in the improvement of manufacturing processes to maximize yield and decrease variability. It is widely used in many fields with broad application across all the natural and social sciences, to name a few: Biostatistics, Agriculture, Marketing, Software engineering. Industry etc. After completing Course in DOE students should have developed a clear understanding of:

- The fundamental concepts of design of experiments.
- Introduction to planning valid and economical experiments within given resources.
- Completely randomized design.
- Randomized block design.
- Latin square design.

- Balanced incomplete block design.
- Full and confounded factorial designs with two and three levels.
- Fractional factorial designs with two levels.

### **Multivariate Analysis and Nonparametric Methods**

The learning objectives include:

- 1) Study of theoretical concepts of Bi variant Normal and Multivariate Normal Distributions along with their properties.
- 2) Analyze multivariate data.
- 3) Application of Wald's SPRT and Non-Parametric methods of testing of hypothesis

On completion of the course, students should have achieved the following

- 1) The understanding of basic concepts associated with Multivariate Normal Distributions and their properties with special emphasis on Bivariate Normal Distribution.
- 2) Analyzing Multivariate data using data reduction techniques like Principal Component Analysis, Factor Analysis.
- 3) Classification method namely Discriminate Analysis.
- 4) Application of Wald's SPRT for testing simple null hypothesis vs simple alternative hypothesis along with the study of the O.C. function and the ASN function for various underlying continuous and discrete distributions.
- 5) Testing of hypothesis using Non-Parametric tests like Median test, Runs test, U test, Kruskal Wallis test etc. and ability to use them judiciously for the testing of given data.

### **Discipline Specific Elective Papers**

Students of this course are taught to understand and predict the changes in economy. Areas of learning include:

- 1 Profit of experience.
- 2 Safety from future
- 3 Utility Studies
- 4 Sales Forecasting
- 5 Budgetary Analysis
- 6 Stock Market Analysis
- 7 Yield projections
- 8 Economic Forecasting
- 9 Census Analysis
- 10 Risk Analysis & Evaluation of changes.

The 'Operations Research' is not only confined to any specific agency like defense services but today it is widely used in all industrial organizations. It can be used to find the best solution to any problem be it simple or complex. It is useful in every field of human activities. Thus, it attempts to resolve the conflicts of interest among the components of organization in a way that is best for the organization as a whole. Main fields where OR is extensively used are:

1. National Planning and Budgeting
2. Defense Services
3. Industrial Establishment and Private Sector Units
4. Research & Development and Engineering

Econometrics deals with the measurement of economic relationships. It is an integration of economics, mathematical economics and statistics with an objective to provide numerical values to the parameters of economic relationships. It may be pointed out that the econometric methods can be used in other areas like engineering sciences, biological sciences, medical sciences, geosciences, agricultural sciences etc. In simple words, whenever there is a need of finding the stochastic relationship in mathematical format, the econometric methods and tools help.

After completing this course, students should have developed a clear understanding of:

- The fundamental concepts of econometrics.
- Specification of the model.
- Multiple Linear Regression.
- Multi collinearity.
- Heteroscedasticity.
- Autocorrelation.
- Autoregressive and Lag models
- Use of Dummy Variables
- Specification Errors

Students learn to handle censored data, techniques and tools to obtain survival probability and knowledge of clinical drug trials. After completion they can work in health industry.

In this course students learn about Probability, Tools Needed for Option Pricing: Wiener process, stochastic integration, and stochastic differential equations; Pricing Derivatives: Arbitrage relations and perfect financial markets, pricing futures, put-call parity for European options, relationship between strike price and option price; Stochastic Models in Finance; Continuous time-process-geometric Brownian motion; Ito's lemma, Black-Scholes formula for European options; Hedging portfolios: Delta, Gamma and Theta hedging; Binomial Model for European options: Cox-Ross-Rubinstein approach to option pricing and discrete dividends

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**SALIPUR AUTONOMOUS COLLEGE, SALIPUR  
CUTTACK, Odisha-754202**

**PROGRAM OUTCOMES(POs), PROGRAM SPECIFIC OUTCOMES(PSO) AND  
COURSE OUTCOMES(COs)**

**SCIENCE FACULTY**

**A)CHEMISTRY**

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

<p><b>Programme Specific Outcomes</b></p>	<p>PSO-1. Gain the knowledge of Chemistry through theory and practical's.</p> <p>PSO-2. To explain nomenclature, stereochemistry, structures, reactivity, and mechanism of the chemical reactions.</p> <p>PSO-3. Identify chemical formulae and solve numerical problems.</p> <p>PSO-4. Use modern chemical tools, Models, Chem-draw, Charts and Equipments.</p> <p>PSO-5. Know structure-activity relationship.</p> <p>PSO-6. Understand good laboratory practices and safety. PSO-7. Develop research oriented skills.</p> <p>PSO-8. make aware and handle the sophisticated instruments/equipments.</p>
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## Course Outcomes

After completion of these courses students should be able to;

CO-1. Write an expression for rate constant K for third order reaction

CO-2. Solve the numerical problems based on Rate constant

CO-3. Understand the term specific volume, molar volume and molar refraction

CO-4. Know the meaning of phase, component and degree of freedom and derive the expression for rotational spectra for the transition from J to J+1

CO-5. Know the meaning of various terms involved in co-ordination chemistry

CO-6. To understand Werner's formulation of complexes and identify the types of valences

CO-7. Know the limitations of VBT

CO-8. Know the shapes of d-orbital's and degeneracy of d-orbital's and draw the geometrical and optical isomerism of complexes

CO-9. Define organic acids and bases.

CO-10. Distinguish between geometrical and optical isomerism.

CO-11. Discuss kinetics, mechanism and stereochemistry of  $SN^1$  and  $SN^2$  reactions.

CO-12. Compare between  $E_1$  and  $E_2$  reactions.

CO-13. Understand the evidences, reactivity and mechanism of various elimination and substitution reactions.

CO-14. Know the principles of common ion effect and solubility product and study the methods of thermo-gravimetric analysis.

CO-15. Understand the principles of Spectro-photometric analysis and properties of electromagnetic radiations.

CO-16. Study the Voltammetry and Polarography as an analytical tool and measure the absorbance of atoms by AAS.

CO-17. Know the importance of chemical industry and classify various insecticides.

CO-18. Study the nutritive aspects of food constituents.

CO-19. Understand the characteristics of some food starches and study the manufacture of cement, dyes, Glass, Soap and detergents by modern methods.

CO-20. Know the role of agriculture chemistry and its potential

CO-21. Understand the basic concept of soil, properties of soil & its classification on the basis of pH.

CO-23. Know the different plant nutrients, their functions and deficiency symptoms.

CO-24. Identify the problematic soil and recommend a method for their reclamation.

CO-25. Have the knowledge of various pesticides, insecticides, fungicides and herbicides.

CO-26. Understand Mechanics of system of particles and know the Redox reaction.

CO-27. Study the Crystal Field Theory.

CO-28. Solve the cell reaction and calculate EMF and calculate interplanar distance.

CO-29. Understand De-Broglie hypothesis and Uncertainty principle

CO-30. Derive Schrödinger's time dependent and independent equations

CO-31. Study the electronic configuration of lanthanides and actinides and get knowledge of Crystalline solid.

CO-32. Understand different operation in stoichiometric molecule and study the Bio-inorganic chemistry.

CO-33. Understand the p-type semiconductor and n-type semiconductor.

CO-34. To study UV, IR and NMR spectroscopy.

CO-35. Discuss different types of rearrangement reactions.

CO-36. Determine structure of compound by spectroscopic methods and understand the difference between carbocation and carbanion.

CO-37. To study alkaloids, Ephedrine, citral molecule with their properties and application.

CO-38. Know the different analytical techniques.



CO-39. To understand different types of separation techniques and to study principle, construction and working of GC and HPLC and to give an extended knowledge about chromatographic techniques used for separation of amino acids.

CO-40. Discuss the problem based on distribution coefficient and extraction techniques.

CO-41. Know the various pharmaceutical drugs, their application and synthesis.

CO-42. To study the waste management.

CO-43. To understand the function of dyes, paints and pigments.

CO-44. To study the various type of surfactants.

CO-45. To know about molasses and bagasse and to study the different types of polymer.

CO-46. Know the market of milk in different breeds.

CO-47. Understand the basic principle of sterilization, homogenization, and standardization of milk.

CO-48. Study the flow sheet diagram of shrikhand powder, whey powder, and ice-cream.

CO-49. Study the different nutrient value in milk.

CO-50. Calculate molar and normal solution of various concentrations and determine specific rotations and percentage of to optically active substances by polarimetrically.

CO-51. Study the energy of activation and second order reaction and study the stability of complex ion and stranded free energy change and equilibrium constant by potentiometry.

CO-52. Find out the acidity, Basicity and PKa Value on pH meter.

CO-53. Study the gravimetric and volumetric analysis of ores and alloy and prepare a various inorganic complexes and determine its % purity and to study binary mixture with removal of borate and phosphate.

CO-54. To understand the chromatographic techniques

CO-55. Perform the Binary mixtures.

CO-56. Preparation of organic compounds, their purifications and run TLC.

CO-57. Determination of physical constant: Melting point, Boiling point.

CO-58. Different separation techniques.

## 2)PHYSICS

<b>Department of Physics</b>	After successful completion of three year degree program in physics a student should be able to;
<b>PROGRAM OUTCOMES</b>	PO-1. Demonstrate, solve and an understanding of major concepts in all disciplines of physics.
	PO-2. Solve the problem and also think methodically, independently

	and draw a logical conclusion.
	PO-3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments.
	PO-4. Create an awareness of the impact of Physics on the society, and development outside the scientific community.
	PO-5. To inculcate the scientific temperament in the students and outside the scientific community.
	PO-6. Use modern techniques, decent equipments and Phonics software's

### PROGRAM SPECIFIC OUTCOMES

PSO-1.	Gain the knowledge of Physics through theory and practical's.
PSO-2.	Understand good laboratory practices and safety.
PSO-3.	Develop research oriented skills
PSO-4.	Make aware and handle the sophisticated instruments/equipments.

### COURSE OUTCOMES

CO-1. Know the Cartesian, spherical polar and cylindrical co-ordinate systems.

CO-2. To understand the Special Theory of Relativity.

CO-3. Discuss the Michelson- Morley Experiment.

CO-4 To obtain the series solution by Frobenius method .

CO-5 Study the Generating function for Legendre, Hermite polynomials.

CO-6. Know the principles of structures determination by diffraction

CO-7. To understand the principles and techniques of X-rays diffraction

CO-8. Know the fundamental principles of semiconductors and be able to estimate the charge carrier mobility and density

CO-9. To give an extended knowledge about magnetic properties like diamagnetic, paramagnetic, ferromagnetic, ferrites and superconductors.

CO-10. Understand Newton's Laws of motion and their applications such as projectile and rocket motion

- CO-11. Gain the knowledge of motion in central force field
- CO-12. Classify elastic and inelastic scattering
- CO-13. Know the difference between Laboratory and centre of mass system
- CO-14. Understands Lagrangian and Hamiltonian formulation
- CO-15 Solve the problems using Lagrangian and Hamiltonian formulation
- CO-16 Get knowledge of canonical transformation and Poisson's bracket .
- CO-17. To know the Rutherford Experiment of atom.
- CO-18. To understand molecular spectra of atom.
- CO-19. To study the Raman spectra.
- CO-20. To study the Zeeman Effect.
- CO-21. To understand the Quantum Numbers.
- CO-22. Write algorithm and flow chart for c-programming language.
- CO-23. To use of iterative, decision making and the jump statement.
- CO-24. Understand the concept of arrays and pointers.
- CO-25. Study of user defined functions and program structures.
- CO-26. Able to use the concept graphics in c language.
- CO-27. To study the Mechanical, Electrical and Thermal Properties of material.
- CO-28. Discuss the type of Phase Diagrams.
- CO-29. Know the solid solution and types of solid solution.
- CO-30. Understanding the Point Defect, Line Defect with example.
- CO-31. Study the Diffusion Mechanism.
- CO-31. Know the difference between Elastic and Plastic Deformation.
- CO-32. To understand the Polymer Vulcanization of rubber.
- CO-33. Know the AX-type crystal structure – eg. NaCl, ZnS etc.
- CO-34. Understand Mechanics of system of particles.
- CO-35. Know the Motion in Central Force Field.
- CO-36 Elastic and inelastic scattering.
- CO-37. Solve Lagrangian and Hamiltonian formulation.
- CO-38. Learn Canonical Transformation and Poisson's Bracket.
- CO-39. Understand De-Broglie hypothesis and Uncertainty principle.
- CO-40. Derive Schrödinger's time dependent and independent equations
- CO-41. Solve the problems using Schrödinger's steady state equation
- CO-42. Get knowledge of rigid rotator
- CO-43. Understand different operators in Quantum Mechanics.
- CO-44. To study kinetic theory of Gases.

- CO-45. To study Maxwell Relations and Application.
- CO-46. Know the elementary concept of statistics.
- CO-47. Understand statistical distribution of system of particles.
- CO-48. To study statistical ensembles.
- CO-49. To study Quantum statistics.
- CO-50. Know the properties of nucleus like binding energy, magnetic dipole moment and electric quadrupole moment
- CO-51. To understand the concept of radioactivity and decay law
- CO-52. To study achievement of Nuclear Models of Physics and its limitations
- CO-53. To give an extended knowledge about nuclear reactions such as nuclear fission and fusion
- CO-54. To understand the basic concept of Particle Physics.
- CO-55. Know the special purpose Diode.
- CO-56. To study the Transistor Amplifier.
- CO-57. To understand the FET, JFET, MOSFET.
- CO-58. To study the Operational Amplifier and their types. CO-
59. To know the Timer IC- 555 and its classification. CO-
60. To study the Regulated Power supply.
- CO-61. To understand the Sequential Logic Circuits.
- CO-62. Know the history of LASERS and its basic concepts.
- CO-63. Understand the basic principle and working of different types of lasers.
- CO-64. Know the applications of lasers in various fields.
- CO-65. Understand the characteristics of LASERS.
- CO-66. Learn safety precaution and measures while handling the lasers.

#### 4) MATHEMATICS

#### PROGRAM OUTCOMES

PO1.	Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.
PO2.	A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.
PO3.	Ability to analyze a problem, identify and define the computing requirements, which may be appropriate to its solution.
PO4.	Introduction to various courses like group theory, ring theory, field theory, metric spaces, number theory.

PO5.	Enhancing students' overall development and to equip them with mathematical modelling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.
PO6.	Ability to pursue advanced studies and research in pure and applied mathematical science.

#### PROGRAM SPECIFIC OUTCOMES

PSO1.	Think in a critical manner.
PSO2.	Know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand.
PSO3.	Formulate and develop mathematical arguments in a logical manner.
PSO4.	Acquire good knowledge and understanding in advanced areas of mathematics and statistics, chosen by the student from the given courses.
PSO5	.Understand, formulate and use quantitative models arising in social science, Business and other context.

#### COURSE OUTCOMES

- CO1. Learn to solve system of linear equation.
- CO2. Learn to solve Diophantine equation.
- CO3. Learn to find roots of polynomial over rational.
- CO4. Learn to find graphs, roots and primes integer using maxima software.
- CO5. Introduction to complex analysis.
- CO6. Gain Knowledge of fundamental concepts of real numbers.
- CO7. Verify the value of the limit of a function at a point using the definition of the limit
- CO8. Introduction to sequence and series.
- CO9. Learn to check function is continuous understand the consequences of the intermediate value theorem for continuous functions.
- CO10. Learn Maxima software.
- CO11. Problem solve on algebra and calculus by using maxima software.
- CO12. Knowledge of application of mathematics
- CO13. Introduction to analytical geometry of 2 dimensional.
- CO14. Study of lines in 2 and 3 dimension.
- CO15. Finding equation in various form of line, circle, ellipse, sphere, cones etc.
- CO16. Give the knowledge of geometry using maxima software.
- CO17. Student will be to understand differentiation and fundamental theorem in differentiation and various rules.
- CO18. Geometrical representation and problem solving on MVT and Rolls theorem.
- CO19. Finding extreme values of function.
- CO20. Introduction to Ordinary Differential Equation.

- CO21. Learn Maxima software.
- CO22. Problem solve on analytic geometry and calculus by using maxima software.
- CO23. Problem solving on geometry and calculus.
- CO24. Gain Knowledge of fundamental concepts of real numbers in  $n$  dimensions.  
verify the value of the limit of a function at a point using the definition of the limit in  $\mathbb{R}^n$
- CO25. Find the extreme value in 2 dimensions.
- CO26. Study multiple integration.
- CO27. To understand logical concepts and to show logical equivalences by using truth tables and rules in logics.
- CO28. Learn concept related to counting.
- CO29. Introduction to advanced counting.
- CO30. Problem solving on multivariable calculus and discrete mathematics.
- CO31. Introduction to application of mathematics in real life.
- CO32. Learn to build logical concept.
- CO33. Introduction to vector space and subspace.
- CO34. Use computational techniques and algebraic skills essential for the study of systems of
- CO35. Linear equations, matrix algebra, vector spaces, eigen values and eigenvectors,
- CO36. Orthogonality and Diagonalization.
- CO37. To apply appropriate numerical methods to solve the problem with most accuracy.
- CO38. Using appropriate numerical methods determine approximate solution of ODE and system of linear equation.
- CO39. Compare different methods in numerical analysis w.r.t accuracy and efficiency of solution.
- CO40. To demonstrate used of interpolation method in numerical analysis.
- CO41. Use computational techniques and algebraic skills essential for the study of systems of  
Linear equations, matrix algebra, vector spaces, eigen values and eigenvectors,  
Orthogonality and Diagonalization.
- CO42. Able to understand the Euclidean distance function on  $\mathbb{R}^n$  and appreciate its properties, and state and use the Triangle and Reverse Triangle Inequalities for the Euclidean distance function on  $\mathbb{R}^n$  Explain the definition of continuity for functions from  $\mathbb{R}^n$  to  $\mathbb{R}^m$  and determine whether a given function from  $\mathbb{R}^n$  to  $\mathbb{R}^m$  is continuous
- CO43. Explain the geometric meaning of each of the metric space
- CO44. Distinguish between open and closed balls in a metric space
- CO45. Define convergence for sequences in a metric space and
- CO46. Determine whether a given sequence in a metric space converges
- CO47. Describe fundamental properties of the real numbers that lead to the formal development of real analysis.
- CO48. Comprehend rigorous arguments developing the theory underpinning real analysis.
- CO49. Demonstrate an understanding of limits and how they are used in sequences, series,
- CO50. Construct rigorous mathematical proofs of basic results in real analysis
- CO51. Appreciate how abstract ideas and rigorous methods in mathematical analysis can be applied to important practical problems.
- CO52. Problem solving on metric space and connected and contactless.

- CO53. Understand the importance of algebraic properties with regard to working within various number systems.
- CO54. Extend group structure to finite permutation groups (Caley Hamilton Theorem).  
Generate groups given specific conditions.
- CO55. Symmetry using group theory.
- CO56. Understand the three major concrete models of Boolean algebra: the algebra of sets, the algebra of electrical circuits, and the algebra of logic.
- CO57. Student will be able to solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, or Bernoulli cases.
- CO58. Student will be able to find the complete solution of a nonhomogeneous differential equation as a linear combination of the complementary function and a particular solution.
- CO59. Student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients.
- CO60. Student will be able to find the complete solution of a differential equation with constant coefficients by variation of parameters.
- CO61. Demonstrate by solving various problem based on Symmetry using group theory
- CO62. Find quotients and remainders from integer division
- CO63. Apply Euclid's algorithm and backwards substitution
- CO64. Understand the definitions of congruence, residue classes and least residues add and subtract integers, modulo  $n$ , multiply integers and calculate powers, modulo  $n$
- CO65. Determine multiplicative inverses, modulo  $n$  and use to solve linear congruence.
- CO66. Theory of quadratic residue  
Develop linear programming (LP) models for shortest path, maximum flow, minimal spanning tree, critical path, minimum cost flow, and transshipment problems.
- CO67. Understand the mathematical tools that are needed to solve optimization problems.
- CO68. Formulate pure, mixed, and binary integer programming models.  
Formulate the nonlinear programming models.  
Use some solution methods for solving the nonlinear optimization problems.
- CO69. Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering
- CO70. Understand the definitions of congruence, residue classes and least residues add and subtract integers, modulo  $n$ , multiply integers and calculate powers, modulo  $n$
- CO71. Application based on Diophantine and Chinese remainder theorem and operational research. Compute sums, products, quotients, conjugate, modulus, and argument of complex numbers · Define and analyze limits and continuity for complex functions as well as consequences of continuity Conceive the concepts of analytic functions and will be familiar with the elementary complex functions and their properties ·
- CO72. Determine whether a given function is differentiable, and if so find its derivative.  
Applies the theory into application of the power series expansion of analytic functions ·  
Understand the basic methods of complex integration and its application in contour integration.  
· Analyze sequences and series of analytic functions and types of convergence, ·
- CO73. Evaluate complex contour integrals directly and by the fundamental theorem, apply

the Cauchy integral theorem in its various versions, and the Cauchy integral formula.

CO74. Understand Integrability and theorems on integrability. Recognize the difference between point wise and uniform convergence of a sequence of functions.

Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability.

CO75. Study improper integration using Riemann integration.

Applies the theory into application of the power series expansion of analytic functions · CO76.

Understand the basic methods of complex integration and its application in contour integration. ·

CO77. To analyze sequences and series of analytic functions and types of convergence, Evaluate complex contour integrals directly and by the fundamental theorem, apply the CO78.

Cauchy integral theorem in its various versions, and the Cauchy integral formula

Solve improper integration using Riemann integration.

Solve problem on convergence of function.

CO79. Students will be able to define ring and subrings.

Study of ideals and concept related to ideal.

Study of various integral domain in ring.

CO80. Introduction to field.

Be familiar with the modeling assumptions and derivations that lead to PDEs.

Recognize the major classification of PDEs and the qualitative differences between the classes of equations.

CO81. Be competent in solving linear PDEs using classical solution methods.

Problem on ring and PDE.

Application of PDE in real life.

CO82. Various structural study of ring.

Students will be able to understand two dimensional transformations.

CO83. Students will be able to understand three dimensional transformations.

To get acquainted with typical problem on CG and existence solution.

CO84. Introduction to projection and its types. Bezier curves.

Understand and apply the concept of optimality criteria for various type of optimization problems.

CO85. Solve various constrained and unconstrained problems in single variable as well as multivariable. Solve simple games using various techniques ·

CO86. Analyze economic situations using game theoretic techniques ·

Recommend and prescribe which strategies to implement

CO87. Problem solving on CG & OT.

Application of projection in real life.

CO88. Solve optimal real life problem based on supply and demands.

Solve simple games using various techniques ·

CO89. Analyze economic situations using game theoretic techniques ·

Recommend and prescribe which strategies to implement.

## **D)BOTANY**



## PROGRAM OUTCOME

PO1.	Knowledge and understanding of: 1. The range of plant diversity in terms of structure, function and environmental relationships. 2. The evaluation of plant diversity. 3. Plant classification and the flora of Maharashtra. 4. The role of plants in the functioning of the global ecosystem. 5. A selection of more specialized, optional topics. 6. Statistics as applied to biological data.
PO2.	<b>Intellectual skills – able to:</b> 1. Think logically and organize tasks into a structured form. 2. Assimilate knowledge and ideas based on wide reading and through the internet. 3. Transfer of appropriate knowledge and methods from one topic to another within the subject. 4. Understand the evolving state of knowledge in a rapidly developing field. 5. Construct and test hypothesis. 6. Plan, conduct and write a report on an independent term project.
PO3.	<b>Practical skills:</b> Students learn to carry out practical work, in the field and in the laboratory, with minimal risk. They gain introductory experience in applying each of the following skills and gain greater proficiency in a selection of them depending on their choice of optional modules. 1. Interpreting plant morphology and anatomy. 2. Plant identification. 3. Vegetation analysis techniques. 4. A range of physiochemical analyses of plant materials in the context of plant physiology and biochemistry. 5. Analyze data using appropriate statistical methods and computer packages. 6. Plant pathology to be added for sharing of field and lab data obtained.
PO4.	Transferable skills: 1. Use of IT (word-processing, use of internet, statistical packages and databases). 2. Communication of scientific ideas in writing and orally. 3. Ability to work as part of a team. 4. Ability to use library resources. 5. Time management. 6. Career planning.
PO5.	<b>Scientific Knowledge:</b> Apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form.
PO6.	<b>Problem analysis:</b> Identify the taxonomic position of plants, formulate the research literature, and analyze non reported plants with substantiated conclusions using first principles and methods of nomenclature and classification in Botany.

## PROGRAM SPECIFIC OUTCOMES

PSO1.	Design solutions from medicinal plants for Health problems, disorders and disease of human beings and estimate the phytochemical content of plants which meet the specified needs to appropriate consideration for the public health.
PSO2	. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and development of the information to provide valid conclusions.
PSO3.	Create, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Molecular Biology,

	Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations.
PSO4.	Apply reasoning informed by the contextual knowledge to assess plant diversity, its importance for society, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice.
PSO6.	Apply ethical principles and commit to environmental ethics and responsibilities and norms of the biodiversity conservation.
PSO7.	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

### **COURSE OUTCOMES**

136. Understand the diversity among Algae.
137. Know the systematic, morphology and structure, of Algae. Understand the life cycle pattern of Algae.
138. Understand the useful and harmful activities of Algae.
139. Understand the Biodiversity of Fungi
140. Know the Economic Importance of Fungi
141. Understand the morphological diversity of Bryophytes.
142. Understand the economic importance of the Bryophytes.
143. Understand the Biochemical nature of cell.
144. Know the chemical nature of biomolecules.
145. Understand the different types of interaction in Biomolecules.
146. Structure and general features of enzymes.
147. Concept of enzyme activity and enzyme inhibition.
148. Learn about the movement of sap and absorption of water in plant body.
149. Understand the plant movements.
150. Understand the morphological diversity of Bryophytes and Pteridophytes and Gymnosperms.
151. Understand the economic importance of the Bryophytes and Pteridophytes and Gymnosperms.
152. Know the evolution of Bryophytes and Pteridophytes and Gymnosperms.
153. Understand the habit of the angiosperm plant body.
154. Know the vegetative characteristics of the plant.

155. Learn about the reproductive characteristics of the plant.
156. Understand the plant morphology and basic taxonomy.
157. The eukaryotic cell cycle and mitotic and meiotic cell division
158. Structure and organization of cell membrane
159. Process of membrane transport and membrane models
160. Mendelian and Neo-mendelian genetics
161. To study the phenomenon of dominance, laws of segregation, independent assortment of genes.
162. To understand the different types of genetic interaction, incomplete dominance, codominance, inter allelic genetic interactions, multiple alleles and quantitative inheritance etc.
163. Understand the diversity among Algae.
164. Know the systematic, morphology and structure, of Algae.
165. Understand the life cycle pattern of Algae.
166. Understand the useful and harmful activities of Algae.
167. Understand the Biodiversity of Fungi
168. Know the Economic Importance of Fungi
169. Understand the morphological diversity of Bryophytes.
170. Understand the economic importance of the Bryophytes.
171. Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes.
172. Become aware of applications of different plants in various industries.
173. To highlight the potential of these studies to become an entrepreneur.
174. To equip the students with skills related to laboratory as well as industries based studies
175. Know importance and scope of plant physiology.
176. 2Understand the plants and plant cells in relation to water.
177. Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways.
178. Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration.
179. Learn about the movement of sap and absorption of water in plant body
180. Understand the plant movements.

181. Know the scope and importance of the discipline.
182. Understand plant communities and ecological adaptations in plants.
183. Know the concept of methodology in taxonomy.
184. Learn about conservation of biodiversity, Non-conventional Energy and Pollution.
185. Discover botanical regions of India and vegetation types of Maharashtra.
186. Understand Bioremediation, Global warming and climate change.
187. On completion of the course, students are able to:
188. Gain knowledge about “Cell Science”.
189. Understand Cell wall Plasma membrane, Cell organelles and cell division.
190. Learn the scope and importance of molecular biology.
191. Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material.
192. Understand the process of synthesis of proteins and role of genetic code in polypeptide formation.
193. Understand the role plants in human welfare.
194. Gain knowledge about various plants of economic use.
195. Know importance of plants & plant products.
196. Understand the chemical contents of the plant products.
197. Know about the utility of plant resources.
198. Understand the diversity among Algae.
199. Know the systematic, morphology and structure, of Algae.
200. Understand the life cycle pattern of Algae.
201. Understand the useful and harmful activities of Algae.
202. Understand the Biodiversity of Fungi
203. Know the Economic Importance of Fungi
204. Understand the morphological diversity of Bryophytes.
205. Understand the economic importance of the Bryophytes.
206. Know the taxonomic position, occurrence, thallus structure, reproduction of Bryophytes.
207. Know the scope of Paleobotany, types of fossils, its role in global economy and geological time scale.
208. Understand the various fossil genera representing different fossil groups.
209. Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material.

210. Understand the process of synthesis of proteins and role of genetic code in polypeptide formation.
211. Know the details of Microscopy- Principles of light microscopy, electron microscopy (TEM and SEM).
212. Understand & perform Chromatography and cultural techniques in Botany.
213. Understand the methods used in Micrometry, Microtomy and Microphotography.
214. Learn and understand about mineral nutrition in plants.
215. Understand the growth and developmental processes in plants.
216. Know about Photosynthesis and Respiration in plants.
217. Understand the process of translocation of solutes in plants
218. Know the nitrogen metabolism and its importance.
219. Understand the properties of Monosaccharides, Oligosaccharides and Polysaccharides.
220. They will learn about the Significance of Carbohydrates.
221. Understand the Properties of saturated fatty acids, and unsaturated fatty acids.
222. Understand lipid metabolism in plants.
223. Understand the Beta Oxidation, Gluconeogenesis and its role in mobilization of fatty acids during germination.
224. They will learn about the Significance of lipids.
225. They will be able to understand Brief outline of biosynthesis of amino acid.
226. Understand the protein - structure and classification and protein biosynthesis in prokaryotes and eukaryotes.
227. They will learn about the nucleic acid metabolism.
228. Understand the diversity of Gymnosperms in India
229. Know the evolutionary trends and affinities of living gymnosperms with respect to external and internal features
230. Know the conceptual development of „taxonomy“ and „systematics“
231. Understand the Phylogeny of angiosperms -A general account of the origin of Angiosperms.
232. Understand the general range of variations in the group of angiosperms.
233. Trace the history of development of systems of classification emphasizing angiospermic taxa.
234. To learn the wide activities in angiosperm and trends in classification.
235. Learn about the characters of biologically important families of angiosperms.

236. Know the floral variations in angiospermic families, their phylogeny and evolution.
237. Understand various rules, principles and recommendations of plant nomenclature produces in plant identification.
238. Understand major evolutionary trends in various parts of angiospermic plants
239. Know the methods of pollination and fertilization.
240. Know fertilization, endosperm and embryogeny.
241. Understand the scope & importance of Anatomy.
242. Know various tissue systems.
243. Understand the normal and anomalous secondary growth in plants and their causes.
244. Perform the techniques in anatomy.
245. With respect to recent knowledge students should know about the different tools in the taxonomy so as to relocate the phylogenetic position of plant or taxa.
246. Understand the concept, principle and types of sterilization methods.
247. Know the concept and characteristics of antiseptic, disinfectant and their mode of action.
248. Know the cultivation methods of bacteria, yeast, fungi and virus.
249. Principle, working and applications of instruments viz, pH meters, spectrophotometer, centrifuge, viscometer, and laminar air flow.
250. Understand the Microbial Genetics and Recombination in Bacteria.
251. Know the terminologies in plant pathology.
252. Understand the scope and importance of Plant Pathology.
253. Know the prevention and control measures of plant diseases and its effect on economy of crops.
254. Understand the science of plant breeding.
255. To introduce the student with branch of plant breeding for the survival of human being from starvation.
256. To study the techniques of production of new superior crop varieties.
257. Understand the modern strategies applied in Genetics and Plant Breeding to sequence and analyze genomes
258. Get the detail knowledge about modern strategies applied in Plant Breeding for crop improvement i.e. Mass selection, Pureline Selection and Clonal selection.
259. Know about exploitation of Heterosis, hybrid and variety development and their release through artificial hybridization.
260. Understand the role plants in human welfare.
261. Gain knowledge about various plants of economic use.

262. Know importance of plants & plant products.
263. Understand the chemical contents of the plant products.
264. Know about the utility of plant resources.
265. Know about the genomic organization or living organisms, study of genes genome, chromosome etc.
266. Gain knowledge about the mechanism and essential component required for prokaryotic DNA replication.
267. Understand the fundamentals of Recombinant DNA Technology.
268. Know about the Genetic Engineering.
269. Understand the principle and basic protocols for Plant Tissue Culture.
270. The concept of operon and its structure and regulation.

## 7) ZOOLOGY

### PROGRAM OUTCOMES

PO-1.	Demonstrate, solve and an understanding of major concepts in all disciplines of Zoology.
PO-2	. Solve the problem and also think methodically, independently and draw a logical conclusion.
PO-3.	Understand the evolution, history of phylum.
PO-4.	Create an awareness of the impact of Zoology on the environment, society, and development outside the scientific community.
PO-5.	To study and understand the classification of whole phyla includes in Non chordates with the help of charts/models/pictures.
PO-6.	To inculcate the scientific temperament in the students and outside the scientific community.
PO-7.	Use modern techniques, decent equipments and Zoology software's

### PROGRAM SPECIFIC OUTCOMES

PSO-1.	Gain the knowledge of Zoology through theory and practical's.
PSO-2.	Study and understand the DNA Recombinant technology.
PSO-3.	Understand the testing of hypothesis.

PSO-4.	Use modern Zoological tools, Models, Charts and Equipments.
PSO-5.	Know structure-activity relationship.
PSO-6.	Understand good laboratory practices and safety.
PSO-7.	Develop research oriented skills.
PSO-8.	Make aware and handle the sophisticated instruments/equipments.

## COURSE COUTCOMES

CO-1 Understand the evolution, history of phylum.

CO-2 Understand about the Non Chordate animals.

CO-3 To study the external as well as internal characters of non chordates.

CO-4 To study the distinguishing characters of non chordates.

CO-5 Understand the economical importance of Molluscs

CO-6 Understand the various internal systems like Digestive system, nervous system with the help of charts.

CO-7 Understand the functions of Gemmules and spicules.

CO-8 Understand the economical importance of Molluscan shells.

CO-9. Understand the terms Histology and Physiology

CO-10. Understand the cell, tissue, organ, system and organisms.

CO-11. Study the derivatives of skin- horns, nails, hairs.

CO\_12. Study and understand the terms- acidosis, alkalosis, asphexia, hypoxia, anoxia and cyanosis.

CO-13. Understand about the agencies responsible for Production of various products using biochemistry.

CO-14. Understand the term pH, Buffer.

CO-15. Understand the structure and function of carbohydrate, amino acids, proteins, and lipids.

CO-16. Understand the concept Enzymes and also Vitamins and minerals.

CO-17. Understand the Principle role of Vitamins in metabolism and Deficiency diseases.

CO-18. Know the biotic and abiotic components of ecosystem.

CO-19. Food chain & food web in ecosystem.

CO-20. Understand diversity among various groups of animal kingdom.

CO-21. Understand Animal community & ecological adaptation in animals.

CO-22. Scope, importance and management of biodiversity

CO-23. To study and understand the scope and branches of Medical Zoology.

CO-24. To aware the students for various parasites and diseases which spreads in human with the help of study of host-parasite relationship.

CO-25. To increase awareness for the health in students.

CO-26. Understand the various disease causing vectors like Mosquitoes.

CO-

27. To aware about the typhoid, cholera likes disease.



- CO-28. Understand the importance of medical diagnostic and also understand the term forensic Entomology
- CO-29. Understand the Scope of cell biology, because cell is the basic unit of life.
- CO-30. Understand the Main distinguishing characters between plant cell and animal cell.
- CO-31. To study and understand the whole cell organelles with their structure and function.
- CO-32. Understand the cell cycle and know the importance of various cells in body of organisms.
- CO-33. Understand the various applications of cells by using cell biology like study of various types of tumour.
- CO-34. Understand the Animal cells and various cell organelles by using microphotographs.
- CO-35. Understand the various Applications of Biotechnology.
- CO-36. Study and Understand the Hybridoma technology as well as Enzyme biotechnology.
- CO-37. Study and understand the DNA Recombinant technology.
- CO-38. Understand the industrial and environmental biotechnology.
- CO-39. Study and understand the Stem cell biotechnology.
- CO-40. Understand the Scope and Significance of Biotechnology.
- CO-41. Understand the Importance of physiology and branches of it.
- CO-42. Understand the terms-Osmosis, diffusion, pH and Buffer.
- CO-43. Understand the Digestion and Excretion process, by studying the Organs of it
- CO-44. Understand the process of Metabolism.
- CO-45. Understand the term Detoxification.
- CO-46. Understand the Circulatory system and Lymphatic system.
- CO-47. Study the nervous system.
- CO-48. Understand the Molecular biology and molecular biology.
- CO-49. Understand the cell divisions and types of mutation.
- CO-50. Understand the structure and function of the cells.
- CO-51. Understand the term cell signalling.
- CO-52. Aware the students for Cancer.
- CO-53. Understand the Tools and Techniques in Molecular Biology.
- CO-54. Understand the term ELISA technique and DNA finger printing.
- CO-55. To understand Origin of life with respect to prokaryotic and eukaryotic cells.
- CO-56. Understand the evidences of organic evolution by anatomical embryological list, paleontological, physiological, genetics and molecular biology evidences.
- CO-57. Understand theories of organic evolution, isolation, speciation. CO-
- CO-58. Understand geological time scale, methods and classification of animal distribution and factors affecting animal distribution.
- CO-59. Understand the terms: Gametogenesis, Fertilization and early development.
- CO-60. Understand the Morphogenesis and Organogenesis in animals. CO-
- CO-61. Understand the Aging, Apoptosis and Senescence.
- CO-62. Understand the fundamentals of agricultural, forest, medical and veterinary entomology.
- CO-63. Understand, Morphology and Anatomy of Insects.
- CO-64. Understand intra specific and inter specific relationships among insects.

CO-65. To understand significance of beneficial and harmful insects with reference to their habit and habitat, life cycle, diseases caused by them and their control measures.

## 16. STATISTICS

### PROGRAM OUTCOMES

When the student joins college after school they are free to make their own choices which are very instrumental in changing their attitude towards life and society. It is very important to give them an appropriate and conducive environment to learn and grow. After completion of the degree apart from his/her specialty in the program of his/her choice the student learns a lot during their three year stay that makes them mature enough to take the right decisions at the right time. Students develop analytical thinking and good communication skills during classroom teaching (through projects/presentation/practical) and also as they participate in various activities both at departmental as well as college level.

Being a Central University, the student gets a chance to communicate with students of other states of India which makes them culturally sensitive and socially interactive.

As part of various departmental /college seminars and workshops he learns to respect and protect the environment. These programs also help in generating gender sensitization and building of ethical values to become a responsible citizen when he/she graduates from the college.

### PROGRAM SPECIFIC OUTCOMES

Statistics is the language of the uncertainties riddled modern information age. This program is a compact combination of detailed courses of Statistics and adequate amount of courses on Computer Science, Mathematics and Operations research to complement and offer diversification after the completion of program. The thrust of the program is to provide a platform for pursuing higher studies leading to post-graduate or doctorate degrees. Along with this students are equipped with skill enhancement courses like Research methodology, Statistical packages and R language. Apart from this there is a range of Generic electives courses in Economics, Commerce, Computer Science etc. which students choose as per their interest and aptitude. This enhances theoretical rigor with technical skills which prepare students to become globally competitive to enter into a promising professional life even after graduation.

This program offers a range of traditional avenues in academics, Govt. Service, IAS, Indian Statistical/ Economic Services, Industries, Commerce, Investment Banking, Banks and Insurance Sectors, CSO and NSSO, Research Personnel/Investigator in Govt. organizations such as NCAER, IAMR, ICMR, Statistical and Economic Bureau & various PSUs., Market Research, Actuarial Sciences, Biostatistics, Demography etc. It also provides an array of non-traditional employment avenues ranging from Stock Brokers Analyst, Sports Analyst, Poll Analyst, Business Analyst, Financial Analyst, Content Analyst etc.

### COURSE OUTCOMES

#### Descriptive Statistics

The learning objectives include summarizing the data and to obtain its salient features from the vast mass of original data.

After completing this course, the students should have developed a clear understanding of

- Concepts of statistical population and sample, variables and attributes.

- Tabular and graphical representation of data based on variables.
- ‘Conditions for the consistency’ and criteria for the independence of data based on attributes.
- Measures of central tendency, Dispersion, Skewness and Kurtosis.
- Moments and their use in studying various characteristics of data.
- Different approaches to the theory of probability.
- Important theorems on probability and their use in solving problem
- Concept of correlation, various correlation coefficients- Pearson’s correlation coefficient, Spearman’s rank correlation coefficient, partial correlation coefficient and Multiple correlation coefficient.
- Concept of Principle of least squares for curve fitting and regression lines.

### **Calculus**

Calculus is versatile and Valuable tool for the statistics. Calculus being used in statistics involves integrating over sections of a probability distribution. The content of this paper involves differential calculation, integral calculus and solution of different differential equations which are extremely prevalent in more advanced statistical application.

### **Probability and Probability Distributions**

A probability distribution is a statistical model that shows the possible outcomes of a particular event or course of action as well as the statistical likelihood of each event. Probability distribution functions are quite important and widely used in actuarial science (insurance), engineering, physics, evolutionary biology, computer science and even social sciences such as psychiatry, economics and even medical trials.

### **Algebra**

Algebra is one of the most important courses in the field of statistical computing. The course serves as a building block that will enable students to learn more advanced techniques that will help them to solve problems more quickly and easily.

After completing course, students should have developed a clear understanding of:

- Theory of equations
- Properties of matrices and determinants
- Linear equations
- Rank of a matrix
- Generalized inverse
- Characteristics roots and vectors
- Quadratic forms

. The students will be conversant for their potential studies of Markov chain & stochastic process, Multivariate analysis, Regression analysis, Design of Experiments.

### **Sampling Distribution**

4. To understand the concept of sampling distributions and their applications in statistical

inference.

5. To understand the process of hypothesis testing and its significance
6. Importance of Standard Error and to draw conclusions using p-value

### **Survey Sampling and Indian Official Statistics**

Survey Sampling provides the tolls/ techniques for selecting a sample of elements from a target population keeping in mind the objectives and nature of population. Most of the research work is done through Sample Survey. The students are able to know about Indian Official Statistical System.

After completing the course, students should have developed clear understanding of:

- Basic concepts of survey sampling
- Principles of survey sampling and main steps involved in selecting a sample
- Simple random sampling
- Stratified random sampling
- Systematic sampling
- Ratio and Regression method of estimation
- Cluster sampling (equal cluster size)
- Concepts of sub sampling
- Indian Official Statistical System

### **Mathematical Analysis**

Numerical Analysis:

Theory of finite differences deals with the changes that take place in the value of the dependent variable due to finite changes in the independent variable.

On completion of the course, students should have achieved the following

- 1) Mathematical Operators ( Forward and Backward difference operators , Shift Operator ,Central difference operator ,Derivative)
- 2) Approximating a given set of data by a function using interpolation formula.
- 3) Newton Gregory interpolation formula (forward and backward) for arguments at equal intervals
- 4) Newton's Divided difference interpolation formula and Lagrange's interpolation formula( for unequal intervals)
- 5) Central Difference interpolation formula(Gauss and Sterling's)
- 6) Representation of a polynomial in factorial Notation
- 7) Numerical Quadrature using the interpolation formula( Trapezoidal Rule, Simpson's  $1/3^{\text{rd}}$  and  $3/8^{\text{th}}$  quadrature formula
- 8) Solution of Difference equations

Real Analysis:

Students will have the knowledge of basic properties of the field of real numbers, the knowledge of the series of real numbers and convergence, Bolzano –Weirstrass theorem, Cauchy criteria, the knowledge of real functions-limits of functions and their properties, notion of continuous functions and their properties and the differentiability of real functions and related theorems

### **Statistical Inference**

Statistical inference: Drawing conclusions about the whole population on the basis of a sample.

Statistical inference is the process of deducing properties of an underlying probability distribution by analysis of data. Inferential statistical analysis infers properties about a population, this includes testing hypotheses and deriving estimates.

### **Linear Models**

The learning objectives includes developing a clear understanding of the fundamental concepts of linear models and a range of associated skills allowing the students to work effectively with them. The linear models are useful both in the planning stages of research and in the analysis of resulting data. The combination of theory and applications will prepare students to explore the course & more correctly interpret the output from linear model computer package.

After completing the course students should have developed clear understanding of:

- Basic concepts of linear models. Theory and estimation of linear models
- Gauss Markov Theorem and its use
  
- Fitting of these models, derivation of confidence interval, testing the hypothesis and interpretation of results
- Simple and multiple linear regression models and their applications
- Distribution of Quadratic Forms
- Techniques of analysis of variance and covariance for fixed effect models
- Concepts of residuals and outliers.

### **Stochastic Processes and Queuing Theory**

After completing this course, students should have developed a clear understanding of

- 9) The fundamental concepts of stochastic processes
- 10) Tools needed to analyze stochastic processes
- 11) Markov chains
- 12) Stability of Markov chains
- 13) Poisson process and its variations
- 14) Queuing systems
- 15) Random walk and ruin theory

16) To identify the real life applications of stochastic processes  
**Statistical Computing Using C/C++ Programming**

4. In this course students learn to write code in C to do statistical computing and its role in problem solving. C is a powerful, structured programming language widely used in all areas of study.

5. Student will understand basic data structures and develop logics which will help them to create well-structured programs using C language. It develops the analytical as well as logical thinking of the student.

6. It also opens the adaptability to learn any other programming language and using computer languages/software as a tool to analyze data statistically.

### **Design of Experiments**

DOE is a tool to develop an experimentation strategy that maximizes learning using a minimum of resources. Extensively used by engineers and scientists involved in the improvement of manufacturing processes to maximize yield and decrease variability. It is widely used in many fields with broad application across all the natural and social sciences, to name a few: Biostatistics, Agriculture, Marketing, Software engineering. Industry etc. After completing Course in DOE students should have developed a clear understanding of:

- The fundamental concepts of design of experiments.
- Introduction to planning valid and economical experiments within given resources.
- Completely randomized design.
- Randomized block design.
- Latin square design.
- Balanced incomplete block design.
- Full and confounded factorial designs with two and three levels.
- Fractional factorial designs with two levels.

### **Multivariate Analysis and Nonparametric Methods**

The learning objectives include:

4) Study of theoretical concepts of Bi variant Normal and Multivariate Normal Distributions along with their properties.

5) Analyze multivariate data.

6) Application of Wald's SPRT and Non-Parametric methods of testing of hypothesis

On completion of the course, students should have achieved the following

- 6) The understanding of basic concepts associated with Multivariate Normal Distributions and their properties with special emphasis on Bivariate Normal Distribution.
- 7) Analyzing Multivariate data using data reduction techniques like Principal Component Analysis, Factor Analysis.
- 8) Classification method namely Discriminate Analysis.
- 9) Application of Wald's SPRT for testing simple null hypothesis vs simple alternative hypothesis along with the study of the O.C. function and the ASN function for various underlying continuous and discrete distributions.
- 10) Testing of hypothesis using Non-Parametric tests like Median test, Runs test, U test, Kruskal Wallis test etc. and ability to use them judiciously for the testing of given data.

### **Discipline Specific Elective Papers**

Students of this course are taught to understand and predict the changes in economy. Areas of learning include:

- 1 Profit of experience.
- 2 Safety from future
- 3 Utility Studies
- 4 Sales Forecasting
- 5 Budgetary Analysis
- 6 Stock Market Analysis
- 7 Yield projections
- 8 Economic Forecasting
- 9 Census Analysis
- 10 Risk Analysis & Evaluation of changes.

The 'Operations Research' is not only confined to any specific agency like defense services but today it is widely used in all industrial organizations. It can be used to find the best solution to any problem be it simple or complex. It is useful in every field of human activities. Thus, it attempts to resolve the conflicts of interest among the components of organization in a way that is best for the organization as a whole. Main fields where OR is extensively used are:

5. National Planning and Budgeting
6. Defense Services
7. Industrial Establishment and Private Sector Units
8. Research & Development and Engineering

Econometrics deals with the measurement of economic relationships. It is an integration of economics, mathematical economics and statistics with an objective to provide numerical values to the parameters of economic relationships. It may be pointed out that the econometric methods can be used in other areas like engineering sciences, biological sciences, medical sciences, geosciences, agricultural sciences etc. In simple words, whenever there is a need of finding the stochastic relationship in mathematical format, the econometric methods and tools help.

After completing this course, students should have developed a clear understanding of:

- The fundamental concepts of econometrics.
- Specification of the model.
- Multiple Linear Regression.
- Multi collinearity.
- Heteroscedasticity.
- Autocorrelation.
- Autoregressive and Lag models
- Use of Dummy Variables
- Specification Errors

Students learn to handle censored data, techniques and tools to obtain survival probability and knowledge of clinical drug trials. After completion they can work in health industry.

In this course students learn about Probability, Tools Needed for Option Pricing: Wiener process, stochastic integration, and stochastic differential equations; Pricing Derivatives: Arbitrage relations and perfect financial markets, pricing futures, put-call parity for European options, relationship between strike price and option price; Stochastic Models in Finance; Continuous time-process-geometric Brownian motion; Ito's lemma, Black-Scholes formula for European options; Hedging portfolios: Delta, Gamma and Theta hedging; Binomial Model for European options: Cox-Ross-Rubinstein approach to option pricing and discrete dividends

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# SALIPUR AUTONOMOUS COLLEGE, SALIPUR ,CUTTACK, Odisha-754202

**PROGRAM OUTCOMES(POs), PROGRAM SPECIFIC OUTCOMES(PSO) AND COURSE OUTCOMES(COs)**

## **COMMERCE FACULTY**

### **B.Com. Honours Programme**

#### **A) PROGRAM OUTCOME**

PO1	This program could provide Industries, Banking Sectors, Insurance Companies, Financing companies, Transport Agencies, Warehousing etc., well trained professionals to meet the requirements
PO2	After completing graduation, students can get skills regarding various aspects like Marketing Manager, Selling Manager, over all Administration abilities of the Company
PO3	Capability of the students to make decisions at personal & professional level will increase after completion of this course.
PO4	Students can independently start up their own Business.
PO5	Students can get thorough knowledge of finance and commerce
PO6	The knowledge of different specializations in Accounting, costing, banking and finance with the practical exposure helps the students to stand in organization.

#### **B) Program Specific Outcome**

Statements of Programme Specific Outcomes (PSOs)

By the end of the programme, the student will be able to

PS O1	Understand the basic concepts of the commerce, management, accounting & economics.
PS O2	Analyse relationship among commerce, trade industry, services, management and administration.
PS O3	Perform all accounting activities and can handle type of business very well.

PS O4	Understand application of knowledge of commerce in business service sector industry, marketing, finance entrepreneurship development etc.
PS O5	Develop communication skills and computer awareness and rules of income tax act.
PSO6	Think about commercial and professional way or point of view.
PS O7	Understanding legal issue/ law relating to banking and insurance sector.
PS O8	Self employment confidences develop.
PS O9	Students will prove themselves in different professional exams like C.A. , C S, CMA, MPSC, UPSC. As well as other coerces
PS O1 0	Students will gain thorough systematic and subject skills within various disciplines of finance, auditing and taxation, accounting, management, communication, computer.
PS O1 1	The students will acquire the knowledge, skill in different areas of communication, decision making, innovations and problem solving in day to day business activities.
PS O1 2	Students can also get the practical skills to work as accountant, audit assistant, tax consultant, and computer operator. As well as other financial supporting services.
PS O1 3	Students will be able to do their higher education and can make research in the field of finance and commerce.
PS O1 4	Students will learn relevant Advanced accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business.

### C) Statements of Course Outcomes (COs)

CO1	<p><u>FINANCIAL ACCOUNTING:</u></p> <ul style="list-style-type: none"> <li>✓ To enable the students to learn principles and concepts of Accountancy.</li> <li>✓ Students are enabled with the Knowledge in the practical applications of accounting.</li> <li>✓ To enable the students to learn the basic concepts of Partnership Accounting, and allied aspects of accounting.</li> <li>✓ The student will get thorough knowledge on the accounting practice prevailing in partnership firms and other allied aspects.</li> <li>✓ To find out the technical expertise in maintaining the books of accounts.</li> <li>✓ To encourage the students about maintaining the books of accounts for further reference..</li> </ul>
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CO2	<p><b><u>BUSINESS LAW:</u></b></p> <ul style="list-style-type: none"> <li>✓ The student will well verse in basic provisions regarding legal frame work governing the business world.</li> <li>✓ To know the students with the basic concepts, terms &amp; provisions of Mercantile and Business Laws.</li> <li>✓ To develop the awareness among the students regarding these laws affecting trade business, and commerce</li> </ul>
CO3	<p><b><u>COST ACCOUNTING:</u></b></p> <ul style="list-style-type: none"> <li>✓ To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment. To understand Basic Cost concepts, Elements of cost and cost sheet.</li> <li>✓ Providing knowledge about difference between financial accounting and cost accounting.</li> <li>✓ Ascertainment of Material and Labor Cost.</li> <li>✓ Student's Capability to apply theoretical knowledge in practical situation will be increased</li> </ul>
CO4	<p><b><u>CORPORATE LAWS:</u></b></p> <ul style="list-style-type: none"> <li>✓ The objective of the course is to impart basic knowledge of the provisions of the Companies Act, 2013 and the Depositories Act, 1996. To impart students with the knowledge of fundamentals of Company Law and provisions of the Companies Act of 2013.</li> <li>✓ To apprise the students of new concepts involving in company law regime.</li> <li>✓ To acquaint the students with the duties and responsibilities of Key Managerial Personnel. Case studies involving issues in corporate laws are required to be discussed.</li> </ul>
CO5	<p><b><u>CORPORATE ACCOUNTING</u></b></p> <ul style="list-style-type: none"> <li>✓ This course aims to enlighten the students on the accounting procedures followed by the Companies.</li> <li>✓ Student's skills about accounting standards will be developed.</li> <li>✓ To make aware the students about the valuation of shares.</li> <li>✓ To impart knowledge about holding company accounts, amalgamation, absorption and reconstruction of company.</li> </ul>
CO6	<p><b><u>INCOME TAX LAW AND PRACTICE</u></b></p> <ul style="list-style-type: none"> <li>✓ To provide basic knowledge and equip students with the application of principles and provisions of Income Tax Act 1961.</li> <li>✓ To give knowledge about preparation &amp; Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961.</li> </ul>

<b>CO7</b>	<p data-bbox="453 142 1133 178"><u>MANAGEMENT PRINCIPLES &amp;APPLICATIONS</u></p> <ul data-bbox="453 199 1485 388" style="list-style-type: none"><li data-bbox="453 199 1388 273">✓ The objective of the course is to provide the student with an understanding of basic management concepts, principles and practices.</li><li data-bbox="453 304 1469 340">✓ To understand the concept &amp; functions and importance of management and its application.</li><li data-bbox="453 352 1485 388">✓ To make the student understand principles, functions and d</li></ul>
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CO8	<p><b>GST &amp; INDIRECT TAX</b></p> <p>To equip students with the principles and provisions of Goods and Services Tax (GST), which is, implemented from 2017 under the notion of One Nation, One Tax and One Market and to acquaint students with basic provisions of GST Law and basic working knowledge.</p> <p>To instill the Salient features of CGST Act, SGST Act (Odisha State), IGST Act.</p> <p>To acquaint the students on the procedure relating to levy of, collection and exemption from,tax: (CGST &amp; SGST)- <b>meaning and scope of ‘supply’ under GST law,</b></p>
CO9	<p><b>FUNDAMENTALS OF DATA MANAGEMENT</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> To make students familiar with computer environment &amp; operating systems</li> <li><input type="checkbox"/> To introduce students with accounting packages like tally.</li> <li><input type="checkbox"/> To develop skill and knowledge among students in applications of internet in education of commerce.</li> </ul>
CO10	<p><b>MANAGEMENT ACCOUNTING</b></p> <p>✓ To acquaint the students with basic concepts of management accounting, and basic understanding of tools and techniques used for managerial decision making.</p> <p>✓ After the completion of this paper, the students will be able to have confidence in managing cost issues and also to keep a check on cost control and taking managerial decisions.</p>
CO11	<p><b>COMPUTERIZED ACCOUNTING &amp; E-FILING OF TAX RETURNS</b></p> <ul style="list-style-type: none"> <li>✓ To make students familiar with computer environment</li> <li>✓ To make students familiar with operating systems.</li> <li>✓ To make students aware of accounting packages like tally.</li> <li>✓ To develop skill among students in applications of internet in commerce education</li> <li>✓ To educate students with the networking and different languages of computer.</li> </ul>

CO12	<p><b>FUNDAMENTALS OF FINANCIAL MANAGEMENT</b></p> <ul style="list-style-type: none"> <li>✓ To familiar the students with the fundamentals of banking and thorough knowledge of Financial operations.</li> <li>✓ To build up the capability of students for knowing Business Finance concepts and operations.</li> <li>✓ To make the students aware of business finance tools and practices.</li> <li>✓ To make understandable to the students regarding the new concepts introduced in the business finance system.</li> </ul>
CO13	<p><b>AUDITING AND CORPORATE GOVERNANCE</b></p> <ul style="list-style-type: none"> <li>✓ At the end of the paper student will have detail knowledge about principles and techniques of audit in accordance with current legal requirement and as per the guidelines of different statutory authorities.</li> <li>✓ Students will be versed in the fundamental concepts of Auditing and different aspects of tax.</li> <li>✓ At the end of the paper student will have detail knowledge about principles and techniques of audit in accordance with current legal requirement and as per the guidelines of different statutory authorities.</li> </ul>
CO14	<p><b><u>BUSINESS MATHEMATICS</u></b></p> <ul style="list-style-type: none"> <li>✓ To use and understand useful functions in business as well as the concept of EMI.</li> <li>✓ To understand the different concept of population and sample and to make students familiar with Calculation of various types of averages and variation.</li> <li>✓ To learn the applications of matrices in business.</li> <li>✓ To understand the students to solve LPP to maximize the profit and to minimize the cost.</li> <li>✓ To use regression analysis to estimate the relationship between two variables and to use frequency distribution to make decision.</li> <li>✓ To understand the techniques and concept of different types of index</li> </ul>

	numbers.
<b>CO15</b>	<p><b><u>DSE –1:Financial Markets, Institutions, &amp; Services</u></b></p> <ul style="list-style-type: none"> <li>✓ This course enables the students, the practical knowledge and the tactics in the Financial market.</li> <li>✓ To study and critically analyze the basic concepts and trends in Financial Institutions.</li> <li>✓ To aware of the recent changes in the field of financial market.</li> </ul>
<b>CO16</b>	<p><b><u>DSE-2:MERCHANT BANKING AND FINANCIAL SERVICES</u></b></p> <ul style="list-style-type: none"> <li>✓ Enable the students with Financial Markets and its various segments.</li> <li>✓ To give the students and understanding of the operations and developments in financial markets in India.</li> <li>✓ To acquaint them to gain an insight into the functioning and role of financial institutions in the Indian Economy.</li> <li>✓ To enlighten the students’ knowledge on Banking Regulation Acts.</li> <li>✓ To give a thorough knowledge on Indian Banking System and Acts pertaining to it.</li> <li>✓ To provide understanding of nature, importance, of banking sector.</li> <li>✓ To know the structure of finance related areas.</li> </ul>
<b>CO17</b>	<p><b><u>DSE – 3:Fundamentals of Corporate Tax Planning</u></b></p> <ul style="list-style-type: none"> <li>✓ To provide a conceptual idea about the various provisions of tax planning related to corporate sector.</li> <li>✓ After completion of this paper, students will be able to help tax consultants in tax planning, assessment and filing income tax returns of corporate sector, thereby they can get themselves self-employed.</li> </ul>
<b>CO18</b>	<p><b><u>DSE-4:Business Research Methods and Project Work</u></b></p> <ul style="list-style-type: none"> <li>✓ This course aims at providing the general understanding of business research and the methods of business research. The course will impart learning about how to collect, analyze, present and interpret data.</li> <li>✓ After completion of this paper, the students will be able to assess and apply a range of research method on a practical project.</li> </ul>

<b>CO14</b>	<p><b>GE-1: MICRO ECONOMICS</b></p> <ul style="list-style-type: none"> <li>✓ To provide students knowledge of Micro Economic concepts and inculcate an analytical approach to the subject matter.</li> <li>✓ To arouse the students interest by showing the relevance and use of various economic theories.</li> <li>✓ To apply economic reasoning to solve business problems.</li> </ul>
<b>CO19</b>	<p><b><u>GE-2:Macro &amp; Indian Economy</u></b></p> <ul style="list-style-type: none"> <li>✓ To familiarize the students with the basic concept of Macro Economics and its application.</li> <li>✓ To aware students about Gross National Product (GNP), Net National Product (NNP) ,Income at Factor cost or National Income at Factor Prices,Per Capita Income , Personal Income ( PI ) ,Disposable Income etc.</li> <li>✓ To Study the relationship among broad aggregates.</li> <li>✓ To apply economic reasoning to solve the problems of the economy.</li> </ul>
<b>CO20</b>	<p><b><u>GE-3: Business Statistics</u></b></p> <ul style="list-style-type: none"> <li>✓ The objective of this course is to familiarize students with the basic statistical toolsused for managerial decision-making.</li> <li>✓ To equip the Students with the knowledge of using different statistical tools very much required in the decision making process in any business as well as business research.</li> </ul>
<b>CO21</b>	<p><b><u>GE-4 :Principles of Marketing</u></b></p> <ul style="list-style-type: none"> <li>✓ The objective of this course is to provide basic knowledge of concepts, principles, tools and techniques of marketing.</li> <li>✓ After the completion of this paper, the students will able to identify marketing components and fit them in the value chain along with the various marketing strategies.</li> </ul>
	<p><b><u>SEC-1 :COMMUNICATIVE ENGLISH</u></b></p> <ul style="list-style-type: none"> <li>✓ To offer relevant and practically helpful pieces of prose and poetry to students so that they not only get to know the beauty and</li> </ul>



	<p>communicative power of English but also its practical application</p> <ul style="list-style-type: none"><li>✓ To expose students to a variety of topics that dominates the contemporary socio-economic and cultural life. To make the students aware about the business communication.</li><li>✓ To understand the process and importance of communication.</li><li>✓ To develop awareness regarding new trends in business communication, various media of communication and communication devices.</li><li>✓ To extend business communication skills through the application and exercises</li></ul>
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