BHARTIYA VIDYA MANDIR
SENIOR SECONDARY SCHOOL

2024-2025

CURRICULUM PATHWAY

CLASS XII

KITCHLU NAGAR, LUDHIANA.
PHONE : 0161-2301523, 2303400

SYLLABUS FOR SESSION 2024-25

CLASS–XII

SUBJECT : ENGLISH

TERM-I				
Topics	**Sub-Topics**	**Learning Objectives**	**Activities / Projects / Practicals**	**Assessment Tools & Values**
1. Reading	• Unseen passage : Factual Descriptive / Literary • Unseen Case-based factual passage	Students will be able to : 1. Engage themselves in the text. 2. Decode, analyze, infer & interpret the text. 3. Understand the core concept of the given passage and answer accordingly.	Reading Newspaper & Drawing inferences from Reading passages.	• Worksheets • Assignments • Analytical Thinking
2. Creative Writing • Short Writing Task • Long Writing Task	• Notice Writing • Invitations & Replies • Letter to the Editor, Job Application • Article & Report Writing	Students will be able to : 1. Use appropriate format & fluency. 2. Demonstrate information to a specific group of people. 3. Precisely classify vast amounts of information.	• Activities related to real life experiences.	• Worksheets • Class Test • Assignments • Creative Thinking
3. Literature Textbook & Supplementary Reading Text • Literature Text Book	**FLAMINGO – (Prose Text)** • The Last Lesson	Students will be able to : 1. Understand the need for preserving one's mother tongue. 2. be serious and sincere in doing work and not to Procrastinate. 3. Change their lackadaisical attitude towards their mother tongue.	Group Discussion on the question : • How would you respond when you discover that you will not be allowed to learn and speak in your mother tongue ?	• Worksheets • Assignments of Related Questions • Class Test • Responsibility
	• Lost Spring	Students will be able to : 1. Understand the plight of street children forced into labour early in life. 2. Create social awareness	Classroom discussion on : • plight of the street children forced into labour and deprived	• Worksheets • Assignment of Related Questions • Class Test

		regarding the laws against child labour. 3. Sensitize to the miserable plight of the poorest of the poor.	of the opportunities of schooling.	• Sympathy
	• Deep Water	Students will be able to : 1. develop positive attitude towards life. 2. Know the importance of decision making and determination in adverse circumstances. 3. gain knowledge about different types of Phobias.	• Personal Experience of swimming, if any • will be asked about different fears they have.	• Assignment of related questions. • Character sketch • Class Test • Courage & Consistency
	• The Rattrap	Students will be able to : 1. understand the values like trust, generosity, redemption and confession. 2. understand that everyone should get a second chance to improve onself. 3. understand that kindness & hospitality awaken conscience.	• About the Tom & Jerry Show • About the working of the Rattrap (Class Presentation)	• Assignment of related questions. • Character sketches • Class Test • Compassion
	FLAMINGO – (Poetry) • My Mother At Sixty-Six	Students will be able to : 1. understand the importance of near and dear ones. 2. realise and fulfill their duties toward the elders. 3. comprehend and read the poem with proper pauses & expressions.	Classroom discussion on : • Time spent daily with our elder ones.	• Extract-based questions • Assignments • Class Test • Adaptability & Acceptance
	• Keeping Quiet	Students will be able to : 1. inculcate values like concern, care for each other, patience & responsibility. 2. remain quiet and still be productive and active.	• Example of COVID-19 • About Meditation (Classroom Discussion)	• Extract-based questions • Assignments • Class-Test • Integrity

Supplementary Reader	**VISTAS – (Prose)** • The Third Level	Students will be able to : 1. understand the contrast between the fantasy world and real world. 2. acquire realistic approach towards real life challenges.	• Example of movies related to Time Travel / Virtual Games.	• Worksheets • Assignments • Class-Test • Reasoning & Accuracy
	• The Tiger King	Students will be able to : 1. Judge the consequences of sycophancy. 2. have insight into the political order. 3. understand that whimsical decisions may prove disastrous.	• Examples of vulnerable & extinct species. • Discussion about Astrology	• Assignments • Class Test • Worksheets • Courage & Commitment
	• Journey to the End of the Earth	Students will be able to : 1. analyse and evaluate the effect of human population and climate change. 2. understand that the young generation still has the idealism to save the world.	• About the continents. • About the movies related to climate change. (Group Discussion)	• Assignments • Class Test • Worksheets • Accoutability
	• The Enemy	Students will be able to : 1. Focus on the importance of fulfilling duties. 2. Understand the importance of being humane.	• Discussion About Wars & their consequences • Example of Crickt Teams	• Assignments • Class Test • Worksheets • Compassion & Accountability
TERM-II				
1. Reading	• Unseen Passage : Factual / Descriptive / Literary • Unseen Case-based Passage	Students will be able to : 1. Engage themselves in the text. 2. Decode, analyze, infer & interpret the text. 3. Understand the core concept of the given passage and answer accordingly.	Reading Newspaper & Drawing inferences from Reading Passages.	• Worksheets for Practice • Assignments • Analytical thinking

2. Creative Writing Short Writing Task Long Writing Task	• Notice Writing • Invitations & Replies • Letter to the Editor, Job Application • Article & Reprot Writing	Students will be able to : 1. Use appropriate format & fluency. 2. Demonstrate information to a specific group of people. 3. Precisely clarify vast amounts of information.	Activities related to real life experiences.	• Worksheets • Assignments • Class Test • Creative thinking
3. Literature Text Book & Supple-mentary Reading Text Literature Text Book	**FLAMINGO - (Prose)** • Indigo	Students will be able to : 1. Understand the role of a leader. 2. Understand the importance of rights. 3. Know the sufferings & contributions of freedom fighters.	Classroom discussion on : • Role & Contribution of freedom fighters	• Worksheets • Assignments • Class Test • Credibility
	• Poets & Pancakes	Students will be able to : 1. Analyze the working conditions and people involved in the studios. 2. Understand the use of talent and creativity at its best. 3. Understand that ambition leads to success.	Classroom disussion on : • Today's film technology compared with that of early days of Indian Cinema.	• Worksheets • Assignments • Class Test • Leadership & Teamwork
	• The Interview	Students will be able to : 1. Express personal opinions on the interview genre. 2. Understand the art of questioning & answering skills. 3. Understand the challenges faced by journalists and reporters.	• Role-playing as an interviewer & an interviewee • Example of the movie – NAYAK	• Worksheets • Assignments • Class Test • Knowledge & Respect
	• Going Places	Students will be able to : 1. analyze the difference between realistic and unrealistic dreams. 2. Understand that there is no substitute to hard work. 3. to accept the reality in life and responsibility in the family.	• Describe about one's favourite player. • Discussion on one's ambition / goal in life.	• Worksheets • Assignments • Class Test • Realistic Goals

	FLAMINGO - (Poetry) • A Thing of Beauty	Students will be able to : 1. appreciate and admire the beauty of nature. 2. learn from the stories of great people. 3. understand that nature provide respite from sorrows.	• A meditation activity to think of a beautiful scenery / thing / story / thought	• Worksheets • Assignments • Class Test • Extract-based Questions • Beauty & Inspiration
	• A Roadside Stand	Students will be able to : 1. Understand the contrast between the lives of rich and poor. 2. Understand that the economic well-being of a country depends on a balanced development of the villages and the cities.	Classorm Discussion : • Have you ever stopped at the roadside stand while travelling ? List your observations.	• Worksheet • Assignment • Class Test • Extract-based Questions • Sympathy
	• Aunt Jennifer's Tigers	Students will be able to : 1. Empathise with the victims of male chauvinism. 2. Raise voice against domestic violence. 3. Visualise the constraint of married life experienced by a woman.	Group discussion on : • Gender Equality	• Worksheet • Assignment • Class Test • Extract-based Questions • Empathy
Supplementary Reading Text	**VISTAS – (Prose)** • On the face of it	Students will be able to : 1. gain insight into the loneliness of physically handicapped. 2. overcome negative attitude towards life. 3. face the challenges in life with a positive approach.	Example of "Stephen Hawking" (Class Presentation)	• Worksheet • Assignment • Class Test • Trust
	• Memories of Childhood	Students will be able to : 1. Raise Voice for injustice and discrimination. 2. learn and reflect their own perspective of treating underpriviledged & marginalized community.	Classroom Discussion on : • An incident from the history which tells about untouchability, discrimination social injustice.	• Worksheet • Assignment • Class Test • Respect & Leadership

SUBJECT : ECONOMICS (030)

TERM-I (APRIL TO SEPTEMBER)			
Unit & Chapter	**Key Concept**	**NCERT Learning Outcomes**	**Activities**
1. Introduction	Introduction to Macro Economics Emergence of Macro Economics Importance of Macro Economics	• Explain the nature, scope and methodology of Economics and find out the difference between Micro & Macro. • Explain the evolution of Macro-Economics. • Explain the characteristics of Macro-Economics.	Flow Chart Quiz
2. National Income Accounting National Accounting	Some Basic Concept of Macroeconomics Circular flow of income and Methods of Calculating N.Y Aggregate related to National Y	• Communicate economic information and ideas related to N.Y • Analyses the flow of Production in Economics • Discuss the three methods of Measuring national Income : Value added or Product method, Expenditure method, Income method • GNP, NNP, GDP and NDP at Market Price, at factor cost, Real & Nominal GDP, GDP Deflator, GDP & Welfare.	Mind Map Flow Chart M.C.Q.
3. Determination of Income & Employment	AD & its concepts A two-sector Model Short run Equilibrium output Investment Multiplier & its mechanism Problem of excess & Deficient Demand	• Explains the components of AD in closed & open economy. • Different terms related to Consumption. • Discuss AD and AS Propensity to Consume & Propensity to Save (Average & Marginal) • AS – AD & S + I approach • Working of Multiplier • Discuss the concept of MPC & K & MPS & K • Differentiate between excess & deficient demand. • Measures to correct Inflation & Deflation	Diagrams Case Studies Diagrams M.C.Q. Quiz

4. Government Budget and the Economy	Govt. Budget Objectives of Govt. Budget Classification of Receipts Classification of Expenditure Balanced, Surplus & Deficit Budget	• Explain budget and reason out the main areas of govt. spending and its impact on those areas. • Discuss the Role of the Govt. • Revenue & Capital Receipts • Revenue & Capital Expenditure • How to correct Deficit By adopting Monetary & Fiscal Policy.	Conduct Reserves and Present Findings
Part–B : Indian Economic Development			
6. Development Experience (1947-90)	Economic Development under Colonial Rule Indian Economy (1950-1990)	• Discuss the critical issues of the Indian economy since independence (All the Sectors). • Main features, Problems and Policies of Agriculture Industry (IPR-1956, SSI–Role & Importance) and Foreign Trade.	Conduct Research from Movies & History Books
Economic Reforms since 1991	Features & appraisals of LPG Policy; Concept of Demonetization and GST	• Discuss the need and main features of Liberalization, globalization and Privatization.	Research & Present Case Studies on successful & unsuccessful Economic reforms
7. Current Challenges Facing Indian Economy			
Human Capital Formation	How People become resources Role of HCF in economic Development; Growth of Education Sector in India	• Discuss the links between Investment in Human Capital & Economic Growth • Evaluate the State of India's educational attainment & Enlists the future prospects of Education in India.	Case Study M.C.Q. Research
Rural Development	Credit & Marketing, role of Co-operatives, Agriculture, Diversification, alternative farming, Organic farmking	• Describe the critical role of Credit • Describes the role of govt. in Agriculture Marketing & Evolution, the importance of diversification of Productive activities to sustain livelihood.	M.C.Q. Pre-testing Pilot Survey

Employment	Growth & Changes in Work force participation rate in formal and informal sectors; Problems & Policies	• Describes the importance of employment in a Nation. • Evaluate the distribution of workforce in different sectors. • Evaluate the initiatives taken by Govt. in generating employment opportunities in various sectors and regions.	Students will ask data from Govt. website
TERM-II (OCTOBER TO FEBRUARY)			
Part–A : Introductory Macro Economics			
Money & Banking	Money–Meaning & Functions		Research regarding Barter System
Supply of Money	Supply of Money – Currency held by the Public & Net demand deposits held by Commercial Banks	• Explain various roles of Money & functions of Money • Evaluates the demand of Money & describes the Supply of Money	
Banking	Money creation by Commercial Banking System CRR, SLR, Repo rate, Bank rate, MRL	• Discuss the role & importance of Central Banks and Commercial Banks for Govt., Consumer & Producers • Outline the Process of Money creation • Differentiate Repo rate, Reverse Repo rate and Open market Operations.	Project regarding visit of Bank.
5. Balance of Payments	BOP A/c – Meaning & Components BOP – Surplus & Deficit	• Explain the different components of Current & Capital A/c • Evaluates autonomous & accomodating transactions.	Hypothetical Example of BOP
Foreign Exchange	Foreign Exchange rate – Meaning & Components, Fixed, Flexible & Managed floating Determination of Exchange Rate, Merits & Demerits of Fixed & Flexible Exchange Rate	• Describe foreign exchange rate. • Describe fixed & flexible exchange rate & their merits & demerits. • Describes Managed Floating.	Understanding the Concept of Devaluation & Depreciation by Role Playing
Part–B : Indian Economic Development			
Current Challenges Facing Indian Economy			

* Sustainable Economic Development	Meaning, effects of Economic Development on Resources & Environment : including Global Warming	• Analyses the causes and effects of envrionmental degradation and Resources Depletion. • Discuss the strategies adopted for sustainable development in India.	Case Study M.C.Q.
8. Development Exeprience of India	A comparison with neighbours India & Pakistan; India & China	• Analyses Comparative trends in various economic & human development indicators of India & its neighbours, China and Pakistan.	Flow Chart Quiz

SYLLABUS FOR SESSION 2024-25

CLASS–XII

SUBJECT : BUSINESS STUDIES (054)

PART–A PRINCIPLES AND FUNCTIONS OF MANAGEMENT

	Chapters	Marks
1.	Nature and Significance of Management	16
2.	Principles of Management	
3.	Business Environment	
4.	Planning	14
5.	Organising	
6.	Staffing	20
7.	Directing	
8.	Controlling	
	TOTAL	**50**

PART–B BUSINESS FINANCE AND MARKETING

	Unit	Marks
9.	Financial Management	15
10.	Financial Markets	
11.	Marketing	15
12.	Consumer Protection	
	TOTAL	**30**

SUBJECT : BUSINESS STUDIES

TERM-I

Topic and Subtopics	Learning Outcomes	Values	Activities, Project, Specific Assessment Tools
Ch-1 Nature and Significance of Management • Management – Concept, Objectives, and Importance • Management as Science, Art and Profession • Levels of Management • Management functions – Planning, Organizing, Staffing, Directing and Controlling • Coordination – Concept and Importance	**After going through the chapter, the students will be able to :** • Understand the concept of management • Explain the meaning of Effectiveness and Efficiency • Discuss the objective of management • Describe the importance of management • Examine the nature of management as a science, art and profession • Understand the role of top, middle and lower levels of management • Explain the functions of management • Discuss the concept and characteristics of coordination • Explain the importance of coordination	• Decision Making • Problem solving	Case Studies Mind Map Pictorial MCQ Class test
Ch-2 Principles of Management • Principles of Management – Concept and Significance • Fayol's principles of Management • Taylor's Scientific management – Principles and Techniques	**After going through the chapter, the students will be able to :** • Understand the concept of principles of management • Explain the significance of management principles • Discuss the principles of management developed by Fayol • Explain the principles and techniques of 'Scientific Management' • Compare the contributions of Fayol and Taylor	• Rational thinking • Scientific aptitude • Interpersonal relationship • Problem Solving	Case Studies Mind Map Project Work Class test Crossword puzzles

Ch-3 Business Environment • Business Environment – Concept and Importance • Dimensions of Business Environment – Economic, Social, Technological, Political and Legal Demonetization – Concept and Features	**After going through the chapter, the students will be able to :** • Understand the concept of 'Business Environment'. • Describe the importance of business environment. • Describe the various dimensions of 'Business Environemnt'. • Understand the concept of demonetization	• Rational thinking • Analytical Approach	Case Studies Mind Map Project Work
Ch-4 Planning • Concept, importance and limitations • Planning process • Single use and standing plans : Objectives, Strategy, Policy, Procedure, Method, Rule, Budget and Programme	**After going through the chapter, the students will be able to :** • Understand the concept of planning • Describe the importance of planning • Understand the limitations of planning • Describe the steps in the process of planning • Develop an understanding of single use and standing plans • Describe objectives, policies, strategy, procedure, method, rule, budget and programme as types of plans	• Rational thinking	Case Studies Mind Map Class Test
Ch-5 Organising • Concept and importance • Organising Process • Structure of Organisation – Functional and Divisional Concept, Formal and informal organisation – concept • Delegation : Concept, Elements and Importance • Decentralisation : Concept and Importance	**After going through the chapter, the students will be able to :** • Understand the concept of organising as a structure and as a process. • Explain the importance of organising. • Describe the steps in the process of organising. • Describe functional and divisional structures of organisation. • Explain the advantages, disadvantages and suitability of functional and divisional structure. • Understand the concept of formal and informal organisation. • Discuss the advantages, disadvantages of formal and informal organisation.	• Decision Making • Rational thinking • Interpersonal relationship	Case Studies Mind Map Pictorial MCQ Class Test

	• Understand the concept of delegation. • Describe the elements of delegation. • Appreciate the importance of Delegation. • Understand the concept of decentralisation. • Explain the importance of decentralisation. • Differentiate between delegation and decentralisation.		
Ch-6 Staffing • Concept and Importance of Staffing • Staffing as a part of Human Resource Management – Concept • Staffing Process • Recruitment Process • Selection – Process • Training and Development – Concept and Importance, Methods of Training – On-the-Job and Off-the-Job : Vestibule Training, Apprenticeship Training and Internship Training	**After going through the chapter, the students will be able to :** • Understand the concept of staffing. • Explain the importance of staffing. • Understand the specialized duties and activities performed by Human Resource Management • Describe the steps in the process of staffing • Understand the meaning of recruitment • Discuss the sources of recruitment • Explain the merits and demerits of internal and external sourrces of recruitment • Understand the meaning of selection • Describe the steps involved in the process of selection • Understand the concept of training and development • Appreciate the importance of training to the organisation and to the employees • Discuss the meaning of induction training, vestibule training, apprenticeship training and internship training • Differentiate between training and development • Discuss on-the-job and off-the-job methods of training	Decisoin Making Rational Thinking	Case Studies Mind Map Cross Word Puzzles Pictorial MCQ Class Test

Ch-7 Directing • Concept and Importance • Elements of Directing • Motivation – Concept, Maslow's hierarchy of needs, financial and non-financial incentives • Leadership – Concept, styles – authoritative, democratic and laissez faire • Communication – Concept, formal and informal communication; barriers to effective communication, how to overcome the barriers	**After going through the chapter, the students will be able to :** • Describe the concept of driecting • Discuss the importance of directing • Describe the various elements of directing • Understand the concept of motivation • Develop an understanding of Maslow's Hierachy of needs • Discuss the various financial and non-financial incentives • Understand the concept of leadership • Understand the various styles of leadership • Understand the concept of communication • Understand the elements of the communication process • Discuss the concept of formal and informal communication • Discuss the various barriers to effective communication • Suggest measures for overcoming barriers to communication	• Interpersonal relationship	Case Studies Mind Map Pictorial MCQ Class test
Ch-8 Controlling • Controlling – Concept and importance • Relationship between planning and controlling • Steps in process of control	**After going through the chapter, the students will be able to :** • Understand the concept of controlling. • Explain the importance of controlling. • Describe the relationship between planning and controlling • Discuss the steps in the process of controlling.	• Rational thinking	Case Studies Mind Map Class test Practice test

TERM-II			
Ch-9 Financial Management • Concept, role and objectives of Financial Management • Financial decisions : investment, financing and dividend - Meaning and factors affecting • Financial Planning - Concept and Importance • Capital Structure – concept and factors affecting capital structure • Fixed and Working Capital – Concept and factors affecting their requirements	**After going through the chapter, the students will be able to :** • Understand the concept of Financial Management. • Explain the role of financial management in an organisation. • Discuss the objectives of financial management • Discuss the three financial decisions and the factors affecting them. • Describe the concept of financial planning and its objectives. • Explain the importance of financial planning. • Understand the concept of capital structure. • Describe the factors determining the choice of an appropriate capital structure of a company. • Understand the concept of fixed and working capital. • Describe the factors determining the requirements of fixed and working capital.	• Decision Making • Problem Solving • Financial discipline	Case Studies Mind Map Cross word puzzles Class test
Ch-10 Financial Markets • Financial Markets : Concept • Money Markets : Concept • Capital Market and its types (Primary and Secondary) • Stock Exchange – Functions and trading procedure • Securities and Exchange Board of India (SEBI) – Objectives and Functions	**After going through the chapter, the students will be able to :** • Understand the concept of Financial market. • Understand the concept of money market. • Discuss the concept of capital market. • Explain primary and secondary markets as types of capital market. • Differentiate between capital market and money market. • Distinguish between primary and secondary markets. • Give the meaning of a stock exchange. • Explain the functions of a stock exchange.	• Financial discipline • Rational thinking	Case Studies Mind Map Class test

	• Discuss the trading procedure in a stock exchange. • Give the meaning of depository services and demat account as used in the trading procedure of securities. • State the objectives of SEBI. • Explain the functions of SEBI.		
Ch-11 Marketing • Marketing – Concept, Functions and Philosophies • Marketing Mix – Concept and Elements • Product - branding, labelling and packaging - Concept • Price - Concept, Factors determining price • Physical Distribution – Concept, Components and Channels of Distribution • Promotion – Concept and Elements; Advertising, Personal Selling, Sales Promotion and Public Relations	**After going through the chapter, the students will be able to :** • Understand the concept of marketing. • Explain the features of marketing. • Discuss the functions of marketing. • Explain the marketing philosophies. • Understand the concept of marketing mix. • Describe the elements of marketing mix. • Understand the concept of product as an element of marketing mix. branding, labelling and packaging price. • Describe the factors determining price of a product. • Understand the concept of physical distribution. • Explain the components of physical distribution. • Describe the various channels of distribution. • Understand the concept of promotion as an element of marketing mix. • Describe the elements of promotion mix. • Understand the concept of advertising. • Understand the concept of sales promotion. • Discuss the concept of public relations.	Rational Thinking	Case Studies Mind Map Pictorial MCQs Class Test Project Work

Ch-12 Consumer Protection • Concept and importance of Consumer Protection • Consumer Protection Act 2019 – Meaning of consumer – Consumer Rights and Responsibilities – Who can file a complaint ? – Redressal machinery – Remedies available • Consumer awareness – Role of consumer organization and Non-Governmental Organization (NGOs)	**After going through the chapter, the students will be able to :** • Understand the concept of consumer protection. • Describe the importance of consumer protection. • Discuss the scope of Consumer Protection Act, 2019 • Understand the concept of a consumer according to the Consumer Protection Act, 2019 • Explain the consumer rights • Understand the responsibilities of consumers • Understand who can file a complaint and against whom ? • Discuss the legal rederessal machinery under Consumer Protection Act, 2019 • Examine the remedies available to the consumer under Consumer Protection Act, 2019 • Describe the role of consumer organizations and NGOs in protecting consumers' interests.	• Problem Solving • Rational thinking	Case Studies Mind Map Class test

SYLLABUS FOR SESSION 2024-25

CLASS–XII

SUBJECT : PHYSICAL EDUCATION

COURSE CONTENT

TERM-I (APRIL TO SEPTEMBER)			
Unit No., Name & Topics	**Specific Learning Objectives**	**Suggested Teaching Learning Process**	**Learning Outcomes with specific competencies**
UNIT–1 : Management of Sporting Events 1. Functions of Sports Events Management (Planning, Organising, Staffing, Directing & Controlling) 2. Various Committees & their Responsibilities (pre; during & post) 3. Fixtures and their Procedures – Knock-Out (Bye & Seeding) & League (Staircase, Cyclic, Tabular method) and Combination tournaments. 4. Intramural & Extramural tournaments – Meaning, Objectives & its Significance	• To make the students understand the need and meaning of planning in sports, committees, and their responsibilities for conducting the sports events or tournament. • To teach them about the different types of tournaments and the detailed procedure of drawing fixtures for Knock Out, League Tournaments, and Combination tournaments. • To make the students understand the need for the meaning and significance of intramural and extramural tournaments	• Lecture-based instruction, • Technology-based learning. • Group learning. • Individual learning • Inquiry-based learning • Kinesthetic learning. • Game-based learning • Expeditionary learning	**After completing the unit, the students will be able to :** • Describe the functions of Sports Event Management • Classify the committees and their responsibilities in the sports event • Differentiate the different types of tournaments. • Prepare fixtures of knockout, league & combination. • Distinguish between intramural and extramural sports events. • Design and prepare different types of community

5. Community Sports Program (Sports Day, Health Run, Run for Fun, Run for Specific Cause & Run for Unity)	• To teach them about the different types of community sports and their importance in our society.		
UNIT–2 : Children & Women in Sports 1. Exercise guidelines of WHO for different age groups. 2. Common postural deformities-knock knees, flat foot, round shoulders, Lordosis, Kyphosis, Scoliosis, and bow legs and their respective corrective measures. 3. Women's participation in Sports – Physical, Psychological, and Social benefits. 4. Special consideration (menarche and menstrual dysfunction) 5. Female athlete triad (osteoporosis, amenorrhea, eating disorders).	• To make students understand teh exercise guidelines of WHO for different age group • To make students aware of the common postural deformities • To make students aware of women's sports participation in India and about the special conditions of women. • To make them understand about female athlete triad.	• Lecture-based instruction, • Technology-based learning. • Group learning. • Individual learning • Inquiry-based learning • Kinesthetic learning. • Game-based learning • Expeditionary learning	**After completing the unit, the students will be able to :** • Differentiate exercise guidelines for different stages of growth and development. • Classify common postural deformities and identify corrective measures. • Recognize the role and importance of sports participation of women in India. • Identify special considerations relate to menarche and menstrual dysfunction. • Express female athlete triad according to eating disorders.
UNIT–3 : Yoga as Preventive measure for Lifestyle Disease 1. **Obesity :** Procedure, Benefits & Contraindications for Tadasana, Katichakrasana, Pavanmuktasana,	• To make students Understand about the main life style disease – Obesity, Hypertension, Diabetes, Back Pain and Asthma.	• Lecture-based instruction, • Technology-based learning. • Group learning.	**After completing the unit, the students will be able to :** • Identify the asanas beneficial for different ailments and health problems. • Recognize importance of various asanas for

Matsayasana, Halasana, Pachimottasana, Ardha – Matsyednrasana, Dhanurasana, Ushtrasana, Suryabedhan pranayama. **2. Diabetes :** Procedure, Benefits & Contraindications for Katichakrasana, Pavanmuktasana, Bhujangasana, Shalabhasana, Dhanurasana, Supta-vajarasana, Paschimottanasana, Ardha-Mastendrasana, Mandukasana, Gomukhasana, Yogmudra, Ushtrasana, Kapalabhati. **3. Asthma :** Procedure, Benefits & Contraindications for Tadasana, Urdhwahastottansan a, UttanMandukasan-a, Bhujangasana, Dhanurasana, Ushtrasana, Vakrasana, Kapalbhati, Gomukhasana Matsyasana, Anuloma-Viloma. **4. Hypertension :** Procedure, Benefits & Contraindications for Tadasana, Katichakransana, Uttanpadasana,	• To teach about different Asanas in detail which can help as a preventive Measures for those Lifestyle Diseases.	• Individual learning • Inquiry-based learning • Kinesthetic learning. • Game-based learning • Expeditionary learning	preventive measures of obesity, diabetes, asthma, hypertension, back pain and arthritis • Describe the procedure for performing a variety of asanas for maximal benefits. • Distinguish the contraindications associated with performing different asanas. • Outline the role of yogic management for various health benefits and preventive measures.

Ardha Halasana, Sarala Matyasana, Gomukhasana, UttanMandukasan-a, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadi-shodhanapranayam, Sitlipranayam. 5. **Back Pain and Arthritis :** Procedure, Benefits & Contraindications of Tadasan, Urdhawahastottasana, Ardh-Chakrasana, Ushtrasana, Vakrasana, Sarala Matsyendrsana, Bhujangasana, Gomukhasana, Bhadrasana, Makarasana, Nadi-Shodhana pranayama.			
UNIT–4 : Physical Education and Sports for CWSN (Children with Special Needs – Divyang) 1. Organizations promoting Disability Sports (Special Olympics; Paralympics; Deaflympics) 2. Concept of Classification and Divisioning in Sports 3. Concept of Inclusion in sports, its need, and implementation.	• To make students understand the concept of Disability and Disorder. • To teach the students about the types of disabilities & disorders, their causes, and their nature. • To make them aware of Disability Etiquette.	• Lecture-based instruction, • Technology-based learning. • Group learning. • Individual learning • Inquiry-based learning • Kinesthetic learning. • Game-based learning • Expeditionary learning	**After completing the unit, the students will be able to :** • Value the advantages of physical activities for children with special needs • Differentiate between methods of categorization in sports for CWSN • Understand concepts and the importance of inclusion in sports • Create advantages for Children with Special

4. Advantages of Physical Activities for children with special needs. 5. Strategies to make Physical Activities assessable for children with special needs.	• To make the students Understand the advantage of physical activity for CWSN. • To make the students aware of different strategies for making physical activity accessible for Children with Special Needs.		Needs through Physical Activities • Strategies physical activities accessible for children with special needs.
UNIT–5 : Sports & Nutrition 1. Concept of balanced diet and nutrition 2. Macro and Micro Nutrients : Food Sources & Functions 3. Nutritive & Non-Nutritive Components of Diet 4. Eating for Weight control – A Healthy Weight, The Pitfalls of Dieting, Food Intolerance, and Food Myths 5. Importance of Diet in Sports-Pre, During and Post competition Requirements	• To make the students understand the importance of a balanced diet • To clear the concept of Nutrition – Micro & Macro nutrients, Nutritive & non-Nutritive Components of diet • To make them aware of eating for weight loss and the results of the pitfalls of dieting. • To understand food intolerance & food myths	• Lecture-based instruction, • Technology-based learning. • Group learning. • Individual learning • Inquiry-based learning • Kinesthetic learning. • Game-based learning • Expeditionary learning	**After completing the unit, the students will be able to :** • Understand the concept of a balanced diet and nutrition. Classify Nutritive and Non-Nutritive components of the Diet • Identify the ways to maintain a healthy weight • Know about foods commonly causing food intolerance • Recognize the pitfalls of dieting and food myths
UNIT–6 : Test & Measurement in Sports 1. Fitness Test – SAI Khelo India Fitness Test in School : Age group 5-8 years/ class 1-3 : BMI, Flamingo Balance	• To make students Understand and conduct SAI KHELO INDIA Fitness Test and to make students Understand and conduct General Motor Fitness Test.	• Lecture-based instruction, • Technology-based learning. • Group learning.	**After completing the unit, the students will be able to :** • Perform SAI Khelo India Fitness Test in School [Age group 5-8 years/ (class 1-3) and Age group 9-18 yrs/ (class 4-12)

Test, Plate Tapping Test Age group 9-18 yrs/ class 4-12 : BMI, 50mt Speed test, 600mt Run/Walk, Sit & Reach Flexibility test, Strength test (Partial Abdominal Curl Up, Push-Ups for boys, Modified Push-Ups for girls). 2. Measurement of Cardio-Vascular Fitness – Harvard Step Test – Duration of the Exercise in Seconds × 100/5.5 X Pulse count of 1-1.5 Min after Exercise. 3. Computing Basal Metabolic Rate (BMR) 4. Rikli & Jones - Senior Citizen Fitness Test • Chair Stand Test for lower body strength • Arm Curl Test for upper body strength • Chair Sit & Reach Test for lower body flexibility • Back Scratch Test for upper body flexibility • Eight Foot Up & Go Test for agility • Six-Minute Walk Test for Aerobic Endurance 5. Johnsen – Methney Test of Motor Educability (Front Roll, Roll, Jumping Half-Turn, Jumping full-turn)	• To make students to determine physical fitness Index through Harvard Step Test/ Rockport Test • To make students to calculate Basal Metabolic Rate (BMR) • To measure the fitness level of Senior Citizens through Rikli and Jones Senior Citizen Fitness Test.	• Individual learning • Inquiry-based learning • Kinesthetic learning. • Game-based learning • Expeditionary learning	• Determine physical fitness Index through Harvard Step Test/ Rock- port Test • Compute Basal Metabolic Rate (BMR) • Describe the procedure of Rikli and Jones - Senior Citizen Fitness Test

UNIT–7 : Physiology & Injuries in Sport 1. Physiological factors determining components of physical fitness 2. Effect of exercise on the Muscular System 3. Effect of exercise on the Cardio-Respiratory System 4. Physiological changes due to aging 5. Sports injuries : Classification (Soft Tissue Injuries - Abrasion, Contusion, Laceration, Incision, Sprain & Strain; Bone & Joint Injuries - Dislocation, Fractures - Green Stick, Comminuted, Transverse Oblique & Impacted)	• Understanding the physiological factors determining the compounds of physical fitness • Learning the effects of exercises on Cardiovascular system. • Learning the effects of exercises on the Respiratory System. • Learning the changes caused due to aging. • Understanding the Sports Injuries (Classification, Causes, and Prevention) • Understanding the Aims & Objectives of First Aid • Understanding the Management of Injuries	• Lecture-based instruction, • Technology-based learning. • Group learning. • Individual learning • Inquiry-based learning • Kinesthetic learning. • Game-based learning • Expeditionary learning	**After completing the unit, the students will be able to :** • Recognize the physiological factors determining the components of physical fitness. • Comprehend the effects of exercise on the Muscular system and cardiorespiratory systems. • Figure out the physiological changes due to ageing • Classify sports injuries with its Management.
TERM-II (OCTOBER TO FEBRUARY)			
UNIT–8 : Biomechanics and Sports 1. Newton's Law of Motion & its application in sports 2. Types of Levers and their application in Sports 3. Equilibrium – Dynamic & Static and Centre of Gravity and its application in sports	• Understanding Newton's Laws of Motion and their Application in Sports. • Make students understand the level and its application in sports. • Make students understand the concept of Equilibrium and its application in sports.	• Lecture-based instruction, • Technology-based learning. • Group learning. • Individual learning • Inquiry-based learning • Kinesthetic learning.	**After completing the unit, the students will be able to :** • Understand Newton's Law of Motion and its application in sports • Recognize the concept of Equilibrium and its application in sports. • Know about the Centre of Gravity and will be able to apply it in sports

4. Friction & Sports 5. Projectile in Sports	• Understanding Friction in Sports. • Understanding the concept of Projectile in sports.	• Game-based learning • Expeditionary learning	• Define Friction and application in sports. • Understand the concept of Projectile in sports.
UNIT–9 : Psychology and Sports 1. Personality; its definition & types (Jung Classification & Big Five Theory) 2. Motivation, its type & techniques. 3. Exercise Adherence : Reasons, Benefits & Strategies for Enhancing it 4. Meaning, Concept & Types of Aggressions in Sports 5. Psychological Attributes in Sports – Self-Esteem, Mental Imagery, Self-Talk, Goal Setting	• To make students understand Personality & its classifications. • To make students understand motivtaion and its techniques. • To make students about Exercise Adherence and Strategies for enhancing Adherence to Exercise. • To make them aware of Aggression in sports and types. • To make students understand Psychological Attributes in Sports.	• Lecture-based instruction, • Technology-based learning. • Group learning. • Individual learning • Inquiry-based learning • Kinesthetic learning. • Game-based learning • Expeditionary learning	**After completing the unit, the students will be able to :** • Classify different types of personality and their relationship with sports performance. • Recognise the concept of motivation and identify various types of motivation. • Identify various reasons to exercise, its associated benefits and strategies to promote exercise adherence. • Differentiate between different types of aggression in sports. • Explain various psychological attributes in sports.
UNIT–10 : Training in Sports 1. Concept of Talent Identification and Talent Development in Sports 2. Introduction to Sports Training Cycle – Micro, Meso, Macro Cycle.	• Making the students understand the concept of talent identification and methods in sports • Making the students understand sports training and the different cycle in sports training.	• Lecture-based instruction, • Technology-based learning. • Group learning. • Individual learning • Inquiry-based learning	**After completing the unit, the students will be able to :** • Understand the concept of talent identification and methods used for talent development in sports. • Understand sports training and the different cycle used in the training process.

3. Types & Methods to Develop – Strength, endurance, and Speed. 4. Types & Methods to Develop – Flexibility and Coordinative Ability 5. Circuit Training – Introduction & its importance	• Making the students understand different types & methods of strengths, endurance, and speed. • Making the students understand different types & methods of flexibility and coordinative ability. • Making the students understand Circuit training and its importance.	• Kinesthetic learning. • Game-based learning • Expeditionary learning	• Understand different types & methods to develop – strength, endurance, and speed in sports training. • Understand different types & methods to develop – flexibility and coordinative ability. • Understand Circuit training and its importance.

GUIDELINES FOR INTERNAL ASSESSMENT (PRACTICAL / PROJECTS ETC.)

PRACTICAL	**(Max. Marks 30)**
Physical Fitness Test : SAI Khelo India Test, Brockport Physical Fitness Test (BPFT)*	6 Marks
Proficiency in Games and Sports (Skill of any one IOA recognized Sport/Game of Choice)**	7 Marks
Yogic Practices	7 Marks
Record File***	5 Marks
Viva Voce (Health/Games & Sports/Yoga)	5 Marks

- *Test for CWSN (any 4 items out of 27 items. One item from each component : Aerobic Function, Body Composition, Muscular strength & Endurance, Range of Motion or Flexibility)
- **CWSN (Children With Special Needs – Divyang) : Bocce / Boccia, Sitting Volleyball, Wheel Chair Basketball, Unified Badminton, Unified Basketball, Unified Football, Blind Cricket, Goalball, Floorball, Wheel Chair Races and Throws, or any other Sport/Game of choice.
- **Children with Special Needs can also opt any one Sport/Game from the list as alternative to Yogic Practices. However, the Sport/Game must be different from Test - 'Proficiency in Games and Sports'

******Record File shall include :***

- ***Practical-1*** **:** Fitness tests administration (SAI Khelo India Test)
- ***Practical-2*** **:** Procedure for Asanas, Benefits & Contraindication for any two Asanas for each lifestyle disease.
- ***Practical-3*** **:** Anyone IOA recognized Sport/Game of choice. Labelled diagram of Field & Equipment. Also mention its Rules, Terminologies & Skills.

SUBJECT : MATHEMATICS (041)

Recommended Books : NCERT Part-1, NCERT Part-2

TERM-I (APRIL TO SEPTEMBER)				
Chapters	**Topics**	**Learning Objectives**	**Values**	**Activities**
3. Matrices	• Types of Matrices • Operations on Matrices • Transpose of a matrix • Symmetric and Skew Symmetric Matrices	• Types of Matrices • To add, subtract & multiply the matrices • Transpose of a matrix • Properties of Symmetric and skew symmetric Matrices	• Creativity	Case Study on Matrix Multiplication
4. Determinants	• Definition • Minors and Cofactors • Adjoint and Inverse of a matrix • Applications of Determinants & Matrices	• To find the Value of determinant • To find Minors and Cofactors • To solve system of linear equations using inverse of a Matrix	• Creativity • Problem Solving	Case Study on Matrix Method
2. Inverse Trigonometric Functions	• Introduction, • Basic Concepts • Graphs of ITFs	• Definition, Domain & Range of ITFs, • Principal Values of ITFs • Finding Simplest Form of ITFs	• Logical Reasoning	To draw Graph of $\sin^{-1} x$
5. Continuity & Differentiability	• Continuity - Differentiability • Exponential and Logarithmic Functions • Logarithmic Differentiation, • Derivatives of functions in Parametric forms, • Second order Derivatives	• Continuous Functions • Diff of ITFs • Diff of Implicit Functions • Diff of Exponential and Logarithmic Functions • Logarithmic Differentiations, • Diff of fns expressed in Parametric forms • Second order Derivatives	• Problem Solving	To find limit of a function & Check its Continuity
12. Linear Programming	• Introduction, related terminology such as constraints, objective function, optimization. • Graphical method of solution for problems in two variables,	• Graphical method of solution for problems in two variables, feasible and infeasible regions (bounded or unbounded), • feasible and infeasible solutions,	• Logical Understanding	Case Study on LPP

	Feasible and infeasible regions (bounded or unbounded), Feasible and infeasible solutions, • Optimal feasible solutions	• optimal feasible solutions (up to three non-trivial constraints).		
6. Application of Derivatives	• Rate of Change of Quantities, • Increasing / Decreasing Functions, • Maxima and Minima	• Rate of Change of Quantities • Increasaing / Decreasing Functions • Points of Local Maxima & Local Minima • Absolute Maxima and Minima	Acquiantance with Real Life Problems	Concepts of Maxima & Minima
7. Integrals	• Integration as inverse process of differentiation. • Integration of a variety of functions by different methods • Definite Integrals • Fundamental Theorem of Calculus • Basic properties of definite integrals and evaluation of definite integrals	• Integration as inverse process of differentiation. • Integration of a variety of functions by substitution, • by partial fractions and • by parts. • Evaluation of simple integrals of different types • Basic Properties of definite integrals and evaluation of definite integrals	• Logical Reasoning • Problem Solving	Case Study on Properties of Integrals
8. Applications of Integrals	Introduction • Area under simple curves • area between two curves	Applications in finding the area under simple curves, especially lines, circles / parabolas / ellipses (in standard form only)	• Critical Understanding	To find area using limit as a sum
9. Differential Equations	Introduction, Definition, • Order and degree, • General and particular solutions of a diff. equation. • Methods of solving First order and first Degree Differential Equations.	• General and particular solutions of a diff. equation. • by method of separation of variables, • Solutions of homogeneous diff. equation - Solving linear diff. equation of the type : – dy / dx + py = q, where p and q are functions of x or constant.	• Problem Solving	Real Life Problems

TERM-II (OCTOBER TO FEBRUARY)				
10. Vectors	• Introduction, • Some basic Concepts • Types of Vectors • Addition of Vectors • multiplication of a vector by a scalar, • Position vector of a point dividing a line segment in a given ratio. • Product of two vectors	• Definition, Types of vectors • position vector a point, negative of a vector, components of a vector, addition of vectors, Multiplication of a vector by a scalar, • Definition and properties of scalar (dot) product of vectors, • Definition and properties of vector (cross) product of vectors.	• Critical thinking	To verify $\vec{c}\times(\vec{a}+\vec{b})$ = +
11. Three Dimensional Geometry	• Introduction • Direction cosines and direction ratios of a line joining two points. • Equations of a line in space • Shortest distance between two lines. • Angle between two lines.	• Direction cosines and direction ratios of a line joining two points. • Cartesian equation and vector equation of a line, • Definition of skew lines, • Shortest distance between two lines. $\vec{c}\times\vec{b}$ • Angle between two lines.	• Logical Understanding	To find shortest distance between Two Skew Lines
13. Probability	• Introduction • Conditional probability, • Multiplication theorem on probability, • Independent events, • Bayes' theorem, • Random variable and its probability distribution.	• Conditional probability, Multiplication theorem on probability, • Independent events, • Total probability, • Bayes' theorem, • Random variable and its probability distribution, • Mean of random variable.	• Problem Solving	To find Conditional Probability
1. Relations and Functions	• Types of Relations • Types of Functions	• Reflexive, Symmetric and Transitive Relations • Equivalence relation and Equivalence classes	• Critical thinking	To show Bijective Function

SUBJECT : APPLIED MATHEMATICS (241)

Recommended Books : NCERT, APC Publications

TERM-I (APRIL TO SEPTEMBER)

Chapters	Topics	Learning Objectives	Values	Activities
Matrices	Matrices and types of matrices	• Define matrix • Identity different kinds of matrices • Find the size / order of matrices	• Creativity • Problem Solving	Case Study on Matrix Multiplication
	Equality of matrices, Transpose of a matrix, Symmetric and Skew symmetric matrix	• Determine equality of two matrices • Write transpose of given matrix • Define symmetric and skew symmetric matrix		
	Algebra of Matrices	• Perform operations like addition & subtraction on matrices of same order • Perform multiplication of two matrices of appropriate order • Perform multiplication of a scalar with matrix		
Determinants	Determinants	• Find determinant of a square matrix • Use elementary properties of determinants	• Analytic approach • Problem Solving	Case Study on Matrix Method
	Inverse of a matrix	• Define the inverse of a square matrix • Apply properties of inverse of matrices		
	Solving system of simultaneous equations using matrix method, Cramer's rule and	• Solve the system of simultaneous equations using (i) Cramer's Rule (ii) Inverse of coefficient matrix • Formulate real life problems into a system of simultaneous linear equations and solve it using these methods		

Linear Programming	Introduction and related terminology	• Familiarize with terms related to Linear Programming Problem	Critical thinking	Case Study on LPP
	Mathematical formulation of Linear Programming Problem	• Formulate Linear Programming Problem		
	Different types of Linear Programming Problems	• Identify and formulate different types of LPP		
	Graphical method of solution for problems in two variables	• Draw the Graph for a system of linear inequalities involving two variables and to find its solution graphically		
	Feasible and Infeasible Regions	• Identify feasible, infeasible, bounded and unbounded regions		
	Feasible and infeasible solutions, optimal feasible solution	• Understand feasible and infeasible solutions • Find optimal feasible solution		
Differentiation & Its Applications	Higher Order Derivatives	• Determine second and higher order derivatives • Understand differentiation of parametric functions and implicit functions	• Critical thinking • Problem solving	Case Study Based Questions
	Application of Derivatives	• Determine the rate of change of various quantities • Understand the gradient of tangent and normal to a curve at a given point • Write the equation of tangents and normal to a curve at a given point		
	Marginal Cost and Marginal Revenue using derivatives	• Define marginal cost and marginal revenue • Find marginal cost and marginal revenue		

	Increasing / Decreasing Functions	• Determine whether a function is increasing or decreasing • Determine the conditions for a function to be increasing or decreasing		
	Maxima and Minima	• Determine critical points of the function • Find the point(s) of local maxima and local minima and corresponding local maximum and local minimum values • Find the absolute maximum and absolute minimum value of a function • Solve applied problems		
Integration & Its Applications	Integration	• Understand and determine indefinite integrals of simple functions as anti-derivative	• Problem solving	Competency Based Questions
	Indefinite integrals as family of curves	• Evaluate indefinite integrals of simple algebraic functions by method of : (i) substitution (ii) partial fraction (iii) by parts		
	Definite Integrals as area under the curve	• Define definite integral as area under the curve • Understand fundamental theorem of integral calculus and apply it to evaluate the definite integral • Apply properties of definite integrals to solve the problems		
	Application of Integration	• Identify the region representing C.S. and P.S. graphically • Apply the definite integral to find consumer surplus-producer surplus		

Differential Equations & Modeling	Differential Equations	• Recognize a differential equation • Find the order and degree of a differential equation	• Problem solving	Case Studies
	Formulating and Solving Differential Equations	• Formulate differential equation • Verify the solution of differential equation • Solve simple differential equation		
	Application of Differential Equations	• Define Growth and Decay Model • Apply the differential equations to solve Growth and Decay Models		
Probability Distributions	Probability Distribution	• Understand the concept of Random Variables and its Probability Distributions • Find probability distribution of discrete random variable	• Logical Reasoning	Conditional Probability
	Methematical Expectation	• Apply arithmetic mean of frequency distribution to find the expected value of a random variable		
	Variance	• Calculate the Variance and S.D. of a random variable		
	Binomial Distribution	• Identify the Bernoulli Trials and apply Binomial Distribution • Evaluate Mean, Variance and S.D. of a binomial distribution		
	Poison Distribution	• Understand the Conditions of Poisson Distribution • Evaluate the Mean and Variance of Poisson distribution		
	Normal Distribution	• Understand normal distribution is a Continuous distribution • Evaluate value of Standard normal variate • Area relationship between Mean and Standard Deviation		

Numbers, Quanti-fications & Numerical Applications	Modulo Arithmetic	• Define modulus of an integer • Apply arithmetic operations using modular arithmetic rules	• Logical Reasoning • Problem Solving	Case Studies on Real Life Situations
	Congruence Modulo	• Define congruence modulo • Apply the definition in various problems		
	Alligation and Mixture	• Understand the rule of alligation to produce a mixture at a given price • Determine the mean price of a mixture • Apply rule of alligation		
	Numerical Problems	• Solve real life problems in mathematics		
	Boats and Streams (upstream and downstream)	• Distinguish between upstream and downstream • Express the problem in the form of an equation		
	Pipes and Cisterns	• Determine the time taken by two or more pipes to fill or empty the tank		
	Races and Games	• Compare the performance of two players w.r.t. time, distance		
	Numerical Inequalities	• Describe the basic concepts of numerical inequalities. • Understand and write numerical inequalities.		
TERM-II (OCTOBER TO FEBRUARY)				
Inferential Statistics	Population and Sample	• Define Population and Sample • Differentiate between population and sample • Define a representative sample from a population • Differentiate between a representative and non-representative sample • Draw a representative sample using simple random sampling	• Real Life Problem Accquaintance	Population Migration Data & Its Influence on Urbanisation

		• Draw a representative sample using and systematic random sampling		
	Parameter and Statistics and Statistical Inferences	• Define Parameter with reference to Population • Define Statistics with reference to Sample • Explain the relation between Parameter and Statistic • Explain the limitation of Statistic to generalize the estimation for population • Interpret the concept of Statistical Significance and Statistical Inferences • State Central limit Theorem • Explain the relation between Population-Sampling Distribution-Sample		
	t-Test (one sample t-test and two independent groups t-test)	• Define a hypothesis • Differentiate between Null and Alternate hypothesis • Define and calculate degree of freedom • Test Null hypothesis and make inferences using t-test statistic for one group / two independent groups		
Time Based Data	Components of Time Series	• Distinguish between different components of time series	• Logical Reasoning	Weather Prediction
	Time Series analysis for univariate data	• Solve practical problems based on statistical data and interpret the result		
	Secular Trend	• Understand the long term tendency		
	Methods of Measuring trend	• Demonstrate the techniques of finding trend by different methods		

Financial Mathematics	Perpetuity, Sinking Funds	• Explain the concept of perpetuity and sinking fund • Calculate perpetuity • Differentiate between sinking fund and saving account	• Problem Solving	Stock Price Movement
	Calculation of EMI	• Explain the concept of EMI • Calculate EMI using various methods		
	Calculation of Returns, Nominal Rate of Return	• Explain the concept of rate of return and nominal rate of return • Calculate rate of return and nominal rate of return		
	Compound Annual Growth Rate	• Understand the concept of Compound Annual Growth Rate • Differentiate between Compound Annual Growth Rate and Annual Growth Rate • Calculate Compound Annual Growth Rate		
	Linear Method of Depreciation	• Define the concept of linear method of Depreciation • Interpret cost, residual value and useful life of an asset from the given information • Calculate depreciation		

SUBJECT : ACCOUNTANCY

TERM-I				
Chapters	**Topics**	**Learning Objectives**	**Proposed Activities**	**Values**
Part–A : Accounting for Partnership Firms and Companies				
1. Accounting for Partnership Firms – Fundamental	Partnership features, Provisions of Indian Partnership Act 1932 in the absence of Partnership deed Fixed v/s Fluctuating Capital Accounts, Preparation of Profit and Loss Appropriation Account, Division of Profits among partners including gurantee of profits, Past adjustment.	Describe the characteristics of partnership and contents of partnership deed, significance of provisions of Partnership Act in the absence of partnership deed, Differentiate between fixed and fluctuating capital, outline the process and develop the understanding and skill of preparation of profit and loss appropriation account involving guarantee of profits and skill of making past adjustment.	Quiz	Problem Solving
2. Goodwill : Nature and Valuation	Meaning, Factors affecting and methods of valuation – average profit, super profit and capitalisation	State the meaning, and develop the understanding and skill of valuation of goodwill using different methods.	Case Study	Creative thinking
3. Change in Profit Sharing Ratio Among the Existing Partners	Sacrificing Ratio, gaining ratio, accounting for revaluation of assets and reassessment of liabilities and treatment of reserves, accumulated profits and losses, preparation of revaluation account and balance sheet.	Meaning of sacrificing ratio, gaining ratio and change in profit sharing ratio among existing partners develop the understanding of accounting treatment of revaluation of assets and liabilities, treatment of reserves and accumulated profits by preparing revaluation account and balance sheet.	Case Study	Applying and Analysing

4. Admission of a Partner	Effect of admission of a partner on profit sharing ratio, treatment of revaluation of assets, reassessment of liabilities, reserves, accumulated profits and losses, of goodwill (as per AS 26), adjustment of capital accounts, preparation of current accounts and preparation of balance sheet.	Explain the effect of admission of a partner on profit sharing ratio, treatment of goodwill as per AS26, on revaluation of assets and liabilities, treatment of reserves. Adjustment of capital accounts. Preparation of capital, Current Account and balance sheet of the new firm.	Case Study	Analytical thinkng + Understanding
5, 6. Retirement and Death of a Partner	Effect of retirement and death of a partner on change in profit sharing ratio, treatment of goodwill, treatment for revaluation of assets and reassessment of liabilities, adjustment of accumulated profits, losses and reserves and capital accounts. Preparation of Capital Account, Current account, balance sheet and loan account of the retiring partner, Calculation of deceased partner's share of profits till the date of death, deceased partners capital account and his executor's Account.	Develop the understanding of change in profit sharing ratio due to retirement and death of a partner, Treatment of goodwill, revaluation of assets and liabilities, reserves and accumulated profits or losses on retirement or death of a partner. Learn to make partner's capital account, current account and Balance Sheet. Develop the skill of calculation of deceased partner's share of profits and preparation of Loan Account in both cases – retirement and death of a partner.	Case Study	Problem solving
7. Dissolution of a Partnership firm	Meaning of dissolution of partnership and partnership firm. Types of dissolution of partnership firm, Settlement of accounts – Realisation account, Capital Account, Cash / Bank account and other related accounts.	Understanding the situations under which a partnership firm can be dissolved, develop the understanding and skill of preparing realisation account and other related accounts.	Group Discussion	Analysing & Applying

Unit-2 : Accounting for Companies				
Accounting for share capital	Features and types of companies. Share and share capital – nature and types Accounting for share capital – over subscription, and under subscription, issue at par or at premium, calls in advance and arear, issue for consideration other than cash. Private placement, ESOP, Sweat Equity, forfeiture and Reissue of Shares and disclosure of share capital in Balance Sheet.	Understanding of Differentiate between Equity Shares and Preference Shares, different types of share capital, Accounting treatment of share capital, transactions regarding issue of shares, Understanding of treatment of forfeiture and reissue of shares, and presentation of share capital as per schedule (III) Part I of Companies Act.	Group Discussion and Case Study	Problem Solving and Analytical thinking
Accounting for debentures	Debentures – Meaning, Types, Issue of debentures at par, at premium and at a discount. Issue of debentures for consideration other than cash, Issue with terms of redemptions, issue as colleteral security, Interest on debentures and writing off discount / loss on issue of debentures.	Understanding of transactions related to issue of debentures, Developing the skill of writing of discount / loss on issue of debentures, Understanding the concept of colleteral security and its presentation in balance sheet – Developing the skill of calculating interest on debentures and its accounting treatment.	Quiz	Problem solving
TERM-II				
Part–B : Analysis of Financial Statements				
Financial Statement of a company	Meaning, Nature, Uses and importance of Financial Statement. Statement of Profit and Loss and Balance Sheet in the prescribed form with major headings and Sub-headings (as per Schedule III of the Companies Act, 2013).	Development of Understanding of major headings and sub-headings (as per Schedule III of the Companies Act, 2013) of Balance Sheet as per the prescribed norms / format.	Vocabulary game	Remembering

Financial Statement Analysis	Meaning, Significance, Objectives, Importance and Limitations. Tools for financial statement analysis : Comparative Statements, Common-size Statements, Ratio Analysis, Cash Flow Analysis.	The students will be able to state the meaning of financial statement analysis along with the objectives and limitations of it. They will be able to discuss the meaning of different tools of 'Financial Statements Analysis'.	Quiz	Applying
Accounting Ratio	Meaning, Objectives, Advantages, Classification and Computation. • Liquidity Ratios : Current Ratio and Quick Ratio • Solvency Ratios : Debt to Equity Ratio, Total Assets to Debt Ratio, Proprietory Ratio, Interest coverage ratio and Debt to Capital Employed Ratio • Activity Ratios : Inventory Turnover Ratio, Trade Receivable Turnover Ratio, Trade Payable Turnover Ratio, Fixed Asset Turnover Ratio, Net Assets Turnover Ratio and Wroking Capital Turnover Ratio. • Profitability Ratios : Gross Profit Ratio, Net Profit Ratio, Operating and Operating Profit Ratio, ROI.	Understanding of the meaning, objectives and significance of different type of ratios along with computation of Liquidity Ratios, Solvency Ratios, Activity Ratios and Profitability Ratios.	Quiz	Problem Solving and Applying
Cash Flow Statement	Meaning, Objectives, Benefits, Cash and Cash Equivalents, Classification of Activities and preparation (as per AS-3 Revised) (Indirect Method Only)	Students will be abe to state the meaning and objectives of Cash Flow Statement and also develop the understanding of prepration of Cash Flow Statement using indirect method a per AS-3 with given adjustments.	Group Discussion	Understanding

Tools of Financial Statement Analysis – Comparative Statements and Common Size Statements	Tools for financial Statement Analysis : Meaning, Significance, Objectives, Importance and limitations of Comparative Statements and Common Size Statements	Developing the understanding of meaning and objectives of common size statements and comparative statements along with the skill of preparation of these statements, understand their uses and difference between the two.	Quiz	Applying

SUBJECT : YOGA

PART–A

Unit No. & Name	Topics covered Per unit	Learning Objectives & Outcomes	Values Inculcated
UNIT-1 Introduction to Yoga & Yogic Practices-II	• Shatkarma meaning, purpose and their signifance in Yoga Sadhana. • Yogasana – Meaning, Principal and their Health Benefits • Introduction to Pranayam and Dhyana and their health benefits • Identify career opportunities in Yoga	Students learn in this unit about Shat-karma and different asana.	After completing the unit, students are able to learn the technique to purify the body and different asana.
UNIT-2 Introduction to Yoga Text-II	• Concepts of Ahara (Diet) according yogic text • Significance of Hath Yoga practice in health promotion • Concepts of mental health well being according to Patanjali Yoga • Yogic practice of Patanjali Yoga, Bhairanga and Antranga Yoga • Concept of healthy living style in Bhagavad Gita • Importance of Subjective experience in daily yoga practice	To learn students about nutrition and different types of nutrients	Student learn about the proper diet for body-effects of diet on human system and developing healthy living according to Bhagavad Gita.
UNIT-3 Yoga for Health Promotion–II	• Introduction to First AID and CPR • Yogic management of Stress and its Consequences • Yogic prevention of common diseases • Yoga and personality development	To learn students about First AID	Students learn the importance of First Aid. Stress and types of stress. Stress management technique

PART–B

1. Communication Skills	Active listening, Parts of Speech, Writing Sentences	Make students to learn objective of Communication Skills	Students learn about Communication Skills like listening, speaking and writing. Overcome the barriers in communications.
2. Self Motivation Skills	Motivation and Positve attitude Result Orientation Self Awareness	To learn students about self control	Students learn about goal setting, motivation and awareness.
3. ICT Skills	Basics in MS Office and MS Excel	To learn students about technology skills	Students create Spread Sheet, learn how to present data.
4. Entrepreneurial Skills	Entrepreneurship and entrepreneur barriers in entrepreneur	Learn about Financial Risk and Business	
5. Green Skills	Green jobs and importance of Green Jobs	To aware students about environment	Students aware about pollution in environment and how to minimise it.

PRACTICAL GUIDELINES (50 marks)

1. Project – 10 Marks

   Students will be assigned.

2. VIVA based on project – 05 Marks

   Teacher may ask verbal question related to project, if no project assigned to students Viva may be based on the questions of practical nature from the field.

3. Practical File – 15 Marks

   Students to make Power Point Presentation assignment, Practical File, Report. Instruction shall assign them any outlet to study the elements of Yoga.

4. Demonstration of Skills Competency in Lab activities – 20 Marks

SUBJECT : PHYSICS (042)

Recommended Books :

1. **Physics, Class XII, Part-I and II, Published by NCERT**
2. **Laboratory Manual of Physics for Class XI published by NCERT**
3. **The list of other related books and manuals brought out by NCERT (consider multimedia also).**

Chapters	Topics and Subtopic	Value	Learning Outcomes	Proposed Activities / Activity in the Class
Ch-1 Electric Charges and Fields	Electric charges, Conservation of charge, Coulomb's law-force between two point charges, forces between multiple charges; superposition principle and continuous charge distribution. Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole in uniform electric field. Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite pla sheet and uniformly charged thin spherical shell (field inside and outside)	Critical & Logical thinking	1. Students will be able to produce static electricity. 2. Students will be able to observe the effects of static electricity. 3. Students will be able to recognize and define the terms attract and repel as they relate to static electricity. 4. Students will be able to collect and graph data.	1. comb & straw activity for electrostatic induction and conduction.
Ch-2 Electrostatic Potential and Capacitance	Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charges; equipotential surfaces, electrical potential energy of a system of two-point charges and of electric dipole in an electrostatic	Scientific aptitude	1. Understand the meaning and significance of electric potential. 2. Use electric potential energy to analyze the motion of charged particles.	2. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items

	field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarization, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor (no derivation, formulae only)		3. Calculate the electric potential that a collection of charges produces at a point in space. 4. Calculate the electric potential of useful and important charge distributions.	
Ch-3 Current Electricity	Electric current, flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, V-I characteristics (linear and non-linear), electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance, Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchhoff's rules, Wheatstone bridge.	Human Welfare and rational thinking	To enable students to understand the concept of electric current and potential, Ohm's law, EMF and terminal potential difference. Mechanism of current conduction in metals, temperature dependence of resistance and resistivity, Kirchhoff's laws, Wheatstone bridge	1. To determine resistivity of two / three wires by plotting a graph for potential difference versus current. 2. To find resistance of a given wire / standard resistor using metre bridge. 3. To verify the laws of combination (series) of resistances using a metre bridge. OR To verify the laws of combination (parallel) of resistances using a metre bridge.
Ch-4 Moving Charges and Magnetism	Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long straight wire. Straight solenoid	Honesty,	To enable students to understand and apply Biot Savart law and Ampere circuital law Force on a charged conductor in magnetic field Behaviour of the conductor in magnetic field, Moving coil	4. To determine resistance of a galvanometer by half-deflection method and to find its figure of merit. 5. To convert the given galvanometer (of known resistance

	(only qualitative treatment), force on a moving charge in uniform magnetic and electric fields. Force on a current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-definition of ampere, torque experienced by a current loop in uniform magnetic field; Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer current sensitivity and conversion to ammeter and voltmeter.		galvanometer and its conversion into an ammeter and voltmeter	and figure of merit) into a voltmeter of desired range and to verify the same. OR To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of desired range and to verify the same.
Ch-5	Bar magnet, bar magnet as an equivalent solenoid (qualitative treatment only), magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (qualitative treatment only), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines. Magnetic properties of materials- Para-, dia- and ferro-magnetic substancs with examples, Magnetization of materials, effect of temperature on magnetic properties.	Numerical and Data Inter-pretation Ability	To enable students to understand magnets and its properties. Various terms to study magnetic properties and classification of magnetic materials and their practical applications in our day to day life.	Demonstration of properties of magnet.

Ch-6 Electromagnetic Induction Ch-7 Alternating Current Ch-8 Electromagnetic Waves	Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction. Alternating currents, peak and RMS value of alternating current / voltage; reactance and impedance; LCR series circuit (phasors only), resonance, power in AC circuits, power factor, wattless current. AC generator, Transformer. Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature (qualitative idea only). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviole,t X-rays, gamma rays) including elementary facts about their use	Critical Thinking, Creativity, Reasoning, Logical Ability	To enable students to understand magnetic flux, electromagnetic induction, self and mutual inductance and their applications. To enable students to undertstand alternating current it's various terms flow of alternating current through resistance inductor and capacitance and power of the AC circuit : To enable students to understand concept of electromagnetic waves its properties and applications	To measure the resistance and impedance of an inductor with or without iron core.
Ch-9 Ray Optics and Optical Instruments	Ray Optics : Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optial fibers, refraction at spherical surfaces, lenses, thin lens formula, lens maker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism. Optical	Life Lessons in nature. Responsi-bility		researches in the area of optics to increase the resolution power of microscope and telescope

	instruments; Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.			
Ch-10 Wave Optics	Wave Optics : Wave front and Huygen's principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen's principle. Inteference, Young's double slit experiment and expression for fringe width (No derivation final expression only), coherent sources and sustained interference of light, diffraction due to a single slit, width of central maxima (qualitative treatment only).	Reasoning, Application, Analysis, Accuracy,		
Ch-11 Dual Nature of Radiation and Matter Ch-12 Atoms	Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation-particle nature of light. Experimental study of photoelectric effect Matter waves-wave nature of particles, de-Broglie relation. Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of *n*th possible orbit, velocity and energy of electron in *n*th orbit, hyrodgen line spectra (qualitative treatment only).		Honesty Unity Team building	Students takes initiative to learn about the newer research, discoveries and inventions in Physics; such as, accelerators, thermistors, electrical properties of materials, India's atomic energy programme; research on the possibility of static electricity charging electronic devices; improving magnetic bottles to keep high energy plasma fusion under control

Ch-13 Nuclei	Composition and size of nucleus, nuclear force Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion.		Critical Thinking, Creativity, Reasoning, Logical Ability	develops positive scientific attitude, and appreciates the role and impact of Physics and technology towards the improvement of quality of life and human welfare
Ch-14 Semiconductor	Energy bands in conductors, semiconductors and insulators (qualitative ideas only) Intrinsic and extrinsic semiconductors- *p* and *n* type, *p-n* junction Semiconductor diode I-V characteristics in forward and reverse bias, application of junction diode-diode as a rectifier.	Semi-conductors and diodes form the backbone of modern electronics, finding applications in various domains; Integrated circuits (ICs) power our smartphones, computers, and IoT devices. Light-emitting diodes (LEDs) illuminate our world with energy-efficient lighting solutions.	To enable students to understand conversion of A.C. into D.C. current	Students takes initiatives to learn about the newer research, in electronic as Semiconductor is the building of electronic

SUBJECT : CHEMISTRY

Recommended Books : NCERT Chemistry

PERIODIC TEST-I					
Chapter Name	**Topics**	**Value**	**Learning Outcomes**	**Proposed Activities (In School)**	**Proposed Activities (To be done at home for Revision)**
Solutions	Solutions : Types of solutions, expression of concentration of solutions of solids in liquids, solubility of gases in liquids, solid solutions, colligative properties - relative lowering of vapour pressure, Raoult's law, elevation of boiling point, depression of freezing point, osmotic pressure, determination of molecular masses using colligative properties, abnormal molecular mass, Van't Hoff factor.	Logical reasoning and Problem Solving	The students will be able to : 1. Able to express concentration of different types of solutions in different units 2. Describe colligative properties of solutions 3. Solve numericals related to colligative properties. 4. Comprehend the concept of Raoult's Law and Ideal and Non Ideal solutions. 5. Use Van't Hoff Factor for association and dissociation.	Determination of concentration / molarity of $KMnO_4$ solution by titrating it against a standard solution of : (i) Oxalic acid, (ii) Ferrous Ammonium Sulphate (Students will be required to prepare standard solutions by weighing themselves).	Assignment and Class Test
Electro-chemistry	Electrochemistry : Redox reactions, conductance in electrolytic solutions, specific and molar conductivity, variations of conductivity with concentration, Kohlrausch's Law, electrolysis and law of electrolysis (elementary idea), dry cell-electrolytic cells and	Critical thinking, Problem Solving and Awareness	The students will be able to : 1. Comprehend the concept of Eletro-chemical cells and redox reactions taking place. 2. Write the cell representations and calculate EMF of the Galvanic Cells. 3. Understand the effect of change of concentration on EMF.	Variation of cell potential in $Zn/Zn^{2+} \| Cu^{2+}/Cu$ with change in concentration of electrolytes ($CuSO_4$ or $ZnSO_4$) at room temperature.	Assignment, Project Work and Class Test

	accumulator, EMF of a cell, standard electrode potential, Nernst equation and its application to chemical cells, Relation between Gibbs energy change and EMF of a cell, fuel cells, corrosion.		4. Define and use the Faraday's Laws of Electrolysis 5. Differentiate between Primary, Secondary and Fuel cells along.		
Haloalknes	Haloalkanes and Haloarenes : Haloalkanes and Haloarenes 12 Periods Haloalkanes : Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions, optical rotation. Haloarenes : nature of C-X bond, substitution reactions (Directive influence of halogen in monosubstituted compounds only), Uses and environmental effects of - dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons, DDT.	Curiosity, scientific aptitude and reasoning	The students will be able to : 1. Comprehend the preparation, properties and uses of Haloalkanes and Haloarene. 2. Write the reactions for preparation and properties. 3. Understand the concept of Chirality and Optical Activity. 4. List the steps for the mechanisms–SN1 and SN2.	To demonstrate the concept of SN1 and SN2 reaction using Ball and Stick models (Structures)	Assignment and Class Test
TERM-I					
Alcohols, Phenols and Ethers	Alcohols, Phenols and Ethers : Alcohols : Nomenclature, methods of preparation, physical and chemical properties (of primary alcohols only); identification of primary, secondary and tertiary alcohols, mechanism of	Curiosity, scientific aptitude and reasoning	The students will be able to : 1. Comprehend the preparation, properties and uses of Alcohols, phenols and Ethers. 2. Write the reactions for preparation and properties. 3. Explain the	Tests for the functional groups present in organic compounds : Unsaturation, alcoholic, phenolic, groups	Assignment, and Class Test

	dehydration, uses with special reference to methanol and ethanol; Phenols : Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophillic substitution reactions, uses of phenols. Ethers : Nomenclature, methods of preparation, physical and chemical properties, uses		properties and concept of Isomerism. 4. List the steps for the important mechanisms and naming reactions.		
Aldehydes, Ketones and Acids	Aldehydes, Ketones and Carboxylic Acids : Aldehydes and Ketones : Nomenclature, nature of carbonyl group, method of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes, uses. Carboxylic Acids : Nomenclature, acidic nature, methods of preparation, physical and chemical properties; uses.	Curiosity, scientific aptitude and reasoning	The students will be able to : 1. Understand the preparation and properties of Aldehydes, Ketones and Acid 2. Write the reactions related to properties and preparation of the compounds. 3. List the steps for mechanisms for the reactions. 4. Distinguish between various sets of compounds on the basis of functional group present.	Tests for the functional groups present in organic compounds : Unsaturation aldehydic, ketonic, carboxylic and amino (Primary) groups	Assignment and Class Test
Chemical Kinetics	Chemical Kinetics : Rate of a reaction (Average and instantaneous), factors affecting rate of reaction : concentration, temperature, catalyst; order and molecularity of a reaction, rate law and specific rate constant, integrated rate	Problem solving and Scientific Aptitude	The students will be able to : 1. Comprehend the concept of Chemical Kinetics, Rate of reaction and factors affecting rate of reaction. 2. Define Rate Law, Order and Molecularity for reaction.	Effect of concentration and temperature on the rate of reaction between Sodium Thiosulphate and Hydrochloric acid.	Assignment, Project Work and Class Test

	equations and half-life (only for zero and first order reactions), concept of collision theory (elementary idea, no mathematical treatment). Activation energy, Arrhenius equation.		3. Write the integrated rate law as per kinetics of the compound. 4. Solve the numericals of the first order kinetics and Arrhenius equation. 5. List units and examples for different type of order of a reaction.	(b) Study of reaction rates of any one of the following : (i) Reaction between Potassium Iodate, (KIO_3) and Sodium Sulphite; (Na_2SO_3) using starch solution as indicator (clock reaction).	
Coordination Compounds	Coordination compounds : Cordination compounds – Introduction, ligands, coordination number, colour, magnetic properties and shapes, IUPAC nomenclature of mononuclear coordination compounds. Bonding, Werner's theory, VBT, and CFT; structure and stereoisomerism, importance of coordination compounds (in qualitative inclusion, extraction of metals and biological system).	Curiosity, consciousness and logical reasoning	The students will be able to : 1. Define and understand the concept of co-ordinate bond and co-ordination compounds. 2. List the postulates of Werner's Theory, Valence Bond Theory and Crystal Field Theory with suitable examples. 3. Comprehend the different types of Isomerism exhibited by the co-ordination compounds. 4. Write the IUPAC names.	Project making on applications of coordination chemistry in day to day activities	Assignment, Project Work and Class Test
Amines	Amines : Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines. Diazonium Salts :	Curiosity, scientific aptitude and reasoning	The students will be able to : 1. Concept clarity for nomenclature, preparation, reactions and uses of amines. 2. Compare the basic behaviour of aliphatic and aromatic amines.	Tests for the functional groups present in organic compounds	Assignment, and Class Test

	Preparation, chemical reactions and importance in synthetic organic chemistry		3. Able to distinguish between primary, and tertiary amine.		
d and f-Block Elements	d and f- Block Elements : General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first row transition metals - metallic character, ionization enthalpy, oxidation states, ionic radii, colour, catalytic property, magnetic properties, interstitial compounds, alloy formation, preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$. Lanthanoids - Electronic configuration, oxidation states, chemical reactivity and lanthanoid contraction and its consequences. Actinoids - Electronic Configuration oxidation states and comparison with lanthanoids.	Logical reasoning and scientific temperament	The students will be able to : 1. Explain the properties of d-block elements and lanthanoids and actinoids (f- block) with respect to their electronic configurations, oxidation state, structure and chemical properties. 2. Write chamical reactions of preparation and properties of compounds of d-block elements. 3. List the properties to make the comparative study of different elements.	Determination of various cations and anions using scheme for salt analysis.	Assignment, Project Work and Class Test
Biomolecules	Biomolecules : Carbohydrates - Classification (aldoses and ketoses), monosaccahrides (glucose and fructose), D-L configuration oligosaccharides (sucrose, lactose, maltose), polysaccharides (starch, cellulose, glycogen); Importance of	General awareness and under-standing	The students will be able to : 1. Classify carbohydrates, proteins, vitamins and nucleic acid on the basis of their structure. 2. Explain the structure of various biomolecules. 3. Write reactions to elucidate structure of glucose molecule.	Test for carbohydrates, fats and proteins in pure samples and given food stuffs	Assignment, Project Work and Class Test

	carbohydates. Proteins - Elementary idea of - amino acids, peptide bond, polypeptides, proteins, structure of proteins - primary, secondary, tertiary structure and quaternary structures (qualitative idea only), denaturation of proteins; enzymes. Hormones - Elementary idea excluding structure. Vitamin Classification and functions. Nucleic acid : DNA and RNA		4. Appreciate the role of biomoelcules in biosystem. 5. Enumerate points of differences between different types of biomolecules.		
PERIODIC TEST-II					
Full Syllabus					

SYLLABUS FOR SESSION 2024-25

CLASS–XII

SUBJECT : TAXATION (822)

PART–A EMPLOYABILITY SKILLS

S.No.	Units	Duration in Hours
1.	Unit 1 : Communication Skills-IV	13
2.	Unit 2 : Self-management Skills-IV	07
3.	Unit 3 : Information and Communication Technology Skills-IV	13
4.	Unit 4 : Entrepreneurial Skills-IV	10
5.	Unit 5 : Green Skills-IV	07
	TOTAL DURATION	**50**

The detailed Curriculum / Topics to be covered under Part A : Employability Skills can be downloaded from CBSE website.

PART–B SUBJECT SPECIFIC SKILLS

S.No.	Units	Duration in Hours
1.	IT-1 : Deductions from Gross Total Income	40
2.	IT-2 : Computation of Tax Liability of an Individual	60
3.	IT-3 : TDS and Advance Payment Tax	20
4.	IT-4 : Goods & Service Tax (GST)	30
	TOTAL DURATION	**150**

SUBJECT : TAXATION

PART–A : EMPLOYABILITY SKILLS			
Unit	**Topics to be covered**	**Learning Outcomes**	**Proposed Activity**
1. Communication Skills	1. Importance of active listening at workplace 2. Steps to active listening	1. Describe the steps to active listening skills	1. Demonstration of the key aspects of becoming active listener 2. Preparing posters of steps for active listening
	1. Writing skills to the following : • Sentence • Phrase • Kinds of Sentences • Parts of Sentence • Parts of Speech • Articles • Construction of a Paragraph	2. Demonstrate basic writing skills	1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject
2. Self-Management Skills-IV	1. Finding and listing motives (needs and desires); 2. Finding sources of motivation and inspiration (music, books, activities); expansive thoughts; living fully in the present moment; dreaming big	1. Describe the various factors influencing self-motivation	1. Group discussion on identifying needs and desire 2. Discussion on sources of motivation and inspiration
	1. Describe the meaning of personality 2. Describe how personality influence others 3. Describe basic personality traits 4. Describe common personality disorders- paranoid, antisocial, schizoid, borderline, narcissistic, avoidant, dependent and obsessive	2. Describe the basic personality traits, types and disorders	1. Demonstrate the knowledge of different personality types
3. Information and Communication Technology Skills-IV	1. Introduction to spreadsheet application 2. Spreadsheet applications 3. Creating a new worksheet 4. Operating workbook and entering text 5. Resizing fonts and styles 6. Copying and moving	1. Perform tabulation using spreadsheet application	1. Demonstration and practice on the following : • Introduction to the spreadsheet application • Listing the spreadsheet applications

	7. Filter and Sorting 8. Formulas and functions 9. Password protection 10. Printing a spreadsheet 11. Saving a spreadsheet in various formats.		• Creating a new worksheet • Opening the workbook and enter text • Resizing fonts and styles • Copying and move the cell data • Sorting and Filter the data • Applying elementary formulas and functions • Protecting the spreadsheet with password • Printing a spreadsheet • Saving the spreadsheet in various formats.
	1. Introduction to presentation 2. Software packages for presentation 3. Creating a new presentation 4. Adding a slide 5. Deleting a slide 6. Entering and editing text 7. Formatting text 8. Inserting clipart and images 9. Slide layout 10. Saving a presentation 11. Printing a presentation document	2. Prepare a presentation using presentation application	1. Demonstration and practice on the following : • Listing the software packages for presentation • Explaining the features of presentation • Creating a new presentation • Adding a slide to presentation • Deleting a slide • Entering and edit text • Formatting text • Inserting clipart and images • Sliding layout • Saving a presentation • Printing a presentation document

4. Entrepreneurial Skills	1. Barriers to becoming entrepreneur 2. Behavioral and entrepreneurial competencies – adaptability / decisiveness, initiative / perseverance, interpersonal skills, organizational skills, stress management, valuing service and diversity	1. Identify the general and entrepreneurial behavioral competencies	1. Administering self-rating questionnaire and score responses on each of the competencies 2. Collect small story / anecdote of prominent successful entrepreneurs 3. Identify entrepreneurial competencies reflected in each story and connect it to the definition of behavioral competencies 4. Preparation of competencies profile of students
	1. Entrepreneurial competencies in particular : self-confidence, initiative, seeing and acting on opportunities, concern for quality, goal setting and risk taking, problem solving and creativity, systematic planning and efficiency, information seeking, persistence, influencing and negotiating, team building.	2. Demonstrate the knowledge of self-assessment of behavioral competencies	1. Games and exercises on charging entrepreneurial behaviour and development of competencies for enhancing self-confidence, problem solving, goal setting, information seeking, team building and creativity.
5. Green Skills-IV	1. Role of green jobs in toxin-free homes, 2. Green organic gardening, public transport and energy conservation, 3. Green jobs in water conservation 4. Green jobs in solar and wind power, waste reduction, reuse and recycling of wastes, 5. Green jobs in green tourism 6. Green jobs in building and construction 7. Green jobs in appropriate technology 8. Role of green jobs in improving energy and raw materials use 9. Role of green jobs in limiting greenhouse gas emissions	1. Identify the role and importance of green jobs in different sectors	1. Listing of green jobs and preparation of posters on green job profiles 2. Prepare posters on green jobs.

	10. Role of green jobs minimizing waste and pollution. 11. Role of green jobs in protecting and restoring ecosystems 12. Role of green jobs in support adaptation to the effects of climate change		

PART–B : SUBJECT SPECIFIC SKILLS

Unit	Sub-unit	Learning Outcomes	Proposed Activity
1. Deductions from Gross Total Income	1.1 Introduction : Basic Rules Governing Deduction & Deduction in Respect of Some Payments 1.2 Basic Overview of Deductions in Respect of certain incomes & Deduction 80QQB, 60RRB, 80TTA & 80U.	Basic rules applicable to deductions and know the permissible deduction in respect of incomes.	**Session :** Discussion related to deduction. **Session :** Discussion of deduction 80C to 80GGC with practical example. **Session :** Discussion of deduction related to disability, royalty, patents and saving bank account interest.
2. Computation of Tax Liability of an individual	2.1 Introduction : Calculation of Tax Liability of Individual	Understand the rules for computation of Taxable Income	**Session :** Discussion related to rules related to computation of tax liability. **Session :** Discussion on Practical problems.
3. TDS and Advance Payment of Tax	3.1 Tax Deducted At Source	Understand the meaning of tax deducted at source, various provisions relating to deductions of tax at source, advance tax and Presumptive Taxation Scheme	**Session :** Introduction of various ways for collection and recovery of income-tax and TDS. Discussion of the provisions relating to deduction of tax at source in respect of different incomes. • Collection and analysis of TDS returns of various tax-payers such as salaried employee, corporate assesse, etc. • Acquaint with various provisions related to lower or non-deduction, duties of persons, deducting tax at source and right of tax payers, possible defaults and prosecution proceedings, etc.

	3.2 Advance Payment of Tax		**Session :** Acquaint with the concept advance payment of tax. • Discussion of provisions of Presumptive Taxation Scheme. • Discussion of method to calculate the liability of advance tax on due date. • Discussion of the role of Assessing officer.
4. Goods and Service Tax (GST)	4.1 Meaning of Direct Tax and GST 4.2 Introduction to GST	Meaning of Direct and Indirect Taxes, Previous Tax Structure, Meaning of GST, Features, Advantages and Disadvantages of GST.	**Session :** Introduction of various types of Indirect Taxes prior to coming of GST on 01/07/2017 **Session :** Discussion on the various taxes and tax rates under the pre-GST system. • Discussion on meaning and objectives of GST. • Discussion of various features of GST Law (CGST Act & SGST Act of any state). • Discussion on the advantages and the challenges of GST. • Discussion on the dual GST and IGST calculation. • Discussion on various types of Returns in GST.

SUBJECT : PAINTING (049)

TERM-I			
Topic – Sub-Topic	**Learning Objectives**	**Values**	**Activity**
TOPIC – The Rajasthani School : 1. Origin and Development 2. Sub-Schools-Mewar, Bundi, Jodhpur, Bikaner, Kishangarh and Jaipur 3. Main features of the Rajasthani School 4. Appreciation of the following Rajasthani paintings : (1) Maru-Ragini (2) Radha (Bani-Thani) (3) Chaugan Players (4) Bharat Meets Rama at Chitrakuta (5) Krishna on swing	Students can know about the culture, costume, jewellery, life style of Rajasthan through Paintings of Rajasthani School of Art. Foster intellectual, Curiosity, Global Knowledge, Critical thinking, Cultural awarness.	Through Paintings students can learn team work towards a common goal, life values.	Students will make one painting of Rajasthani Folk art on A2 size sheet.
TOPIC – The Pahari School 1. Origin and development 2. Sub-Schools-Basohli, Guler, Kangra, Chamba and Garwal 3. Main features of the Pahari School 4. Appreciation of the following Pahari paintings : (1) Krishna with Gopis, Nand, Yashoda and (2) Krishna with Kinsmen Going to Vrindavana	Students will able to know : Learning with art helps to increase knowledge and understanding of subject Area. Establish framework for students to develop an aesthetic appreciation for life arts.	Prepare students to be responsible citizens, life long learners and ready leaders in their chosen fields.	Students will make one painting of Landscape with Mountain river and trees.

UNIT-2 : The Mughal and Deccan Schools of Miniature (16th Century AD to 19th Centiry AD)			
TOPIC – The Mughal School 1. Origin and development 2. Main features of the Mughal School 3. Appreciation of the following Mughal **<u>Paintings :</u>** (1) Falcon on a Bird-Rest (2) Marriage Procession of Dara Shukoh (3) Krishna Lifting Mount Goverdhana (4) Kabir and Raidas	Students will be able to know : 21st century skill critical thinking, Improved imagination, creativity, observation. Student will gain knowledge of different cultures and different artist like Haji Madini	They can learn human life values through great Paintings like humanity, mutual harmony.	Make chart of Mughal Time Period on A4 size.
TOPIC – The Deccan School 1. Origin and Development 2. Main Features of the Deccan School 3. Appreciation of the following Deccan **<u>Paintings :</u>** (1) Hazrat Nizamuddin Auliya and Amir Khusro (2) Chand Bibi Playing Polo (Chaugan)	Students will able to know : Through art work of different types of artists, students can learn respect of gurus, senior or juniors. All in all, mutual respect for each other.	Students can see different types of religious influence on Indian Art.	Make one composition on Music & playing scene Size A2.
TERM-II			
UNIT-3 (a) **TOPIC – The Bengal School of Painting** 1. Introduction to the Bengal School 2. National Flag of India and the Symbollic,	Students can know about the wash technique. They can learn renaissance period of Indian art and contribution of India Artist in the struggle of National Freedom Movement.	Through paintings students can learn love and respect, loyalty to the master. Do not be in human and cruel towards animals.	Students will make one painting & wash technique or Bengali folk art.

3. Significance of its forms and the colours. (1) Origin and development of the Bengal School of Panting (2) Main features of the Bengal School of Painting 4. Contribution of Indian artists in the struggle for National Freedom Movement **<u>Paintings :</u>** (1) Journey's End – Abanindranath Tagore (2) Shiv and Sati – Nandia Bose (3) Radhika – M.A.R. Chughtal (4) Meghdoot – Ram Gopal Vijaivargiya	Students will know about of the wash technique and folk art.		
TOPIC – The Modern Trends in Indian Art 1. Appreciation of the following contemporary (Modern) Indian Art **<u>Paintings :</u>** (1) Rama Vanquishing the Pride of the Ocean – Raja Ravi Varma (2) Mother and Child – Jamini Roy (3) Haldi Grinders – Amrita Sher Gill (4) Mother Teresa – M.F. Hussain **Graphic – Prints :** (1) Children – Somnath Hore	Students will be able to known : Demonstrate deep understanding about various Indian Modern trends and techniques. Examine major art school, tradition, artist, artworks, aesthetic values and theories to assess the qualities of work of art in their historical and cultural settings.	Art education activity is helpful for the improvement of art education, cognitive abilities and encourages Critical Thinking, Problem Solving and Decision Making abilities.	Make one canvas painting with oil or acrylic colours.

(2) Devi – Jyoti Bhatt (3) Of Walls – Anupam Sud (4) Man, Woman and Tree – K. Laxma Goud **Sculptures :** (1) Triumph of Labour – D.P. Roychowdhury (2) Santhal Family – Ramkinkar Vaij (3) Cries Un -- heard – Amar Nath Sehgal (4) Ganesha – P.V. Janaki Ram			

PRACTICAL

One Practical Paper **70 Marks**

Time : 6 Hours (3+3)

UNIT WISE WEIGHTAGE

Units	Content	Periods	Marks
1	Nature and Object Study	50	25
2	Painting Competition	50	25
3	Portfolio Assessment	48	20
		148	70

Unit 1 : Nature and Object Study **25 Marks 50 Periods**

Study of two or three natural and geometric forms in pencil with light and shade from a point of view. Natural forms like plants, vegetables, fruits and flowers, etc., are to be used Geometrical forms of objects like cubes, cones, prisms, cylinders and spheres should be used.

Unit 2 : Painting Composition **25 Marksd 50 Periods**

(i) Simple exercises of basic design in variation of geometric and rhythmic shapes geometrical and decorative designs and colours to understand designs as organism visual arrangements. 10 Marks 25 Periods

(ii) Sketches from life and nature 15 Maks 25 Periods

Unit 3 : Portfolio Assessment **20 Marks 48 Periods**

(a) Record of the entire years performance from sketch to finished products. 10 Marks

(b) Five selected nature and object study exercises in any media done during session including the minimum of two still life exercises. 05 Marks

(c) One selected work of paintings composition done during the year. 03 Marks

(d) Two selected works of paintings done during the year. 02 Marks

These selected works prepared during the course by the candidates and certified the school authorities as the work, done in the school will be placed before examiners for assessment.

Note :

1. The candidates should be given one hour-break after first three hours.
2. The time-table to be so framed a to allow the students to work continuously for minimum of two periods at a stretch.

SYLLABUS FOR SESSION 2024-25

CLASS–XII

SUBJECT : MUSIC VOCAL (PRACTICAL) (034)

Sr. No.	Topics
1.	One Vilambit Khayal with simple elaborations and few tanas in any two of the prescribed Ragas.
2.	One Drut Khayal with simple elaborations and few tanas in the following Ragas-Bhairav, Bageshri, and Malkauns.
3.	One Tarana and one Dhamar with dugun and chaugun in any one of the prescribed Ragas.
4.	Ability to recognize the Ragas from the Phrases of swaras rendered by the examiner.
5.	Recitation of the Thekas of Jhaptala, Rupak, and Dhamar with Dugun and Chaugun, keeping tala with hand beats.
6.	Tuning of Tanpura.

SUBJECT : MUSIC VOCAL (034)

TERM-I			
प्रकरण	**अधिगम उद्देश्य**	**जीवन कौशल**	**कला एकीकृत गतिविधियाँ**
1. अलंकार, कण, मींड, खटका, मुर्की, गमक	अलंकार के माध्यम से स्वर ज्ञान के साथ-साथ लय तथा लयकारियों का ज्ञान विद्यार्थियों को मिलेगा। इन्हीं अलंकारों के माध्यम से अनेकानेक अलंकारों की रचना करने में सहायता मिलेगी तथा विद्यार्थियों में कल्पना तथा सृजनात्मक गुणों का विकास संभव हो सकेगा तथा कण, मींड, खटका, मुर्की, गमक के ज्ञान से विद्यार्थियों का गायन रंजकता से परिपूर्ण होगा।	इस ज्ञान के बिना विद्यार्थियों का सांगीतिक ज्ञान रसहीन होता है।	इनके माध्यम से विद्यार्थी गायन का अभ्यास करके अपने कंठ को मधुर बनायेंगे तथा स्वर ज्ञान को बढ़ाने के लिये रियाज़ करेंगे।
2. ग्राम, मूर्च्छना, आलाप, तान	इनके ज्ञान से विद्यार्थी गण संगीत की बारीकियों से अवगत हो जाते हैं। उनका गायन माधुर्यता से ओत-प्रोत हो जाता है।	इनके ज्ञान से विद्यार्थियों का ज्ञान कलात्मकता से भरपूर होगा।	विद्यार्थियों के रियाज़ का स्तर बढ़ेगा।
3. रागों का समय सिद्धान्त	इनके ज्ञान से रागों के गायन समय का ज्ञान विद्यार्थियों को हो जाता है।	इसके अभाव में विद्यार्थी सही समय पर उचित राग का प्रदर्शन नहीं कर पाते।	विद्यार्थी समय के अनुसार राग गायन करते हैं।
4. उस्ताद फैयाज़ खाँ, उस्ताद बड़े गुलाम अली खाँ, पंडित कृष्ण राव शंकर जीवनी	विद्यार्थियों को इन महान् शास्त्रीय संगीत के विद्वानों के जीवन, संघर्ष तथा उपलब्धियों का ज्ञान होता है।	संगीत के इन महान गायकों की जीवनी के ज्ञान से विद्यार्थियों का उत्साह बढ़ता है।	विद्यार्थी इन महान् विद्वानों के जीवन को पढ़ेंगे, समझेंगे तथा ज्ञान में वृद्धि करेंगे।
TERM-II			
5. ताल झपताल, ताल रूपक, ताल धमार	इन तालों के ज्ञान से विद्यार्थी का गायन लय में रहता है तथा रंजकता भरा होता है।	इसके अभाव में गायन भावपूर्ण तथा सौंदर्यात्मक हो ही नहीं सकता।	विद्यार्थी इन तालों का गायन तथा वादन सीखते हैं।
6. तानपूरा	इस वाद्य के ज्ञान से विद्यार्थियों में स्वर में गाने में भरपूर मदद मिलती है।	इसके ज्ञान के अभाव में स्वर ज्ञान कमज़ोर होता है।	विद्यार्थी तानपूरे के विभिन्न भागों की जानकारी के साथ-साथ इसके प्रयोग का ज्ञान लेते हैं।

SUBJECT : INFORMATICS PRACTICES (065)

UNIT–I

Unit 2 : Database Query using SQL Revision of database concepts and SQL commands covered in class XI Math functions : POWER( ), ROUND( ), MOD( ). Text functions : UCASE ( )/UPPER ( ), LCASE ( ) / LOWER ( ), MID ( ) / SUBSTRING ( ) / SUBSTR ( ), LENGTH ( ), LEFT ( ), RIGHT ( ), INSTR ( ), LTRIM ( ), RTRIM ( ), TRIM ( ). Date Functions : NOW ( ), DATE ( ), MONTH ( ), MONTHNAME ( ), YEAR ( ), DAY ( ), DAYNAME ( ). Aggregate Functions : MAX ( ), MIN ( ), AVG ( ), SUM ( ), COUNT ( ); using COUNT (*).

Querying and manipulating data using Group by, Having, Order by. Working with two tables using equl-join.

Unit 1 : Data Visualization : Purpose of plotting; drawing and saving following types of plots using Matplotlib – line plot, bar graph, histogram Customizing plots : adding label, title, and legend in plots.

TERM-I

Unit 3 : Introduction to Computer Networks Introduction to networks, Types of network : PAN, LAN, MAN, WAN. Network Devices : modem, hub, switch, repeater, router, gateway Network Topologies : Star, Bus, Tree, Mesh. Introduction to Internet, URL, W W W, and its applications – Web, email, Chat, VoIP.

Unit 1 : Data Handling using Pandas - I Introduction to Python libraries - Pandas, Matplotlib. Data structures in Pandas - Series and Data Frames. Series : Creation of Series from – ndarray, dictionary, scalar value; mathematical operations; Head and Tail functions; Selection, Indexing and Slicing.

UNIT–II

Data Frames : creation - from dictionary of Series, list of dictionaries, Text/CSV files; display; iteration; Operations on rows and columns : add, select, delete, rename; Head and Tail functions; Indexing using Labels, Boolean Indexing; Importing/Exporting Data between CSV files and Data Frames.

TERM-2

Unit 4 : Societal Impacts Digital footprint, net and communication etiquettes, data protection, intellectual property rights (IPR), plagiarism, licensing and copyright, free and open source software (FOSS), cybercrime and cyber laws, hacking, phishing, cyber bullying, overview of Indian IT Act.

E-waste : hazards and management. Awareness about health concerns related to the usage of technology.

Website : Introduction, difference between a website and webpage, static vs dynamic web page, web server and hosting of a website. Web Browsers : Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

SUBJECT : COMPUTER SCIENCE (083)

UNIT–I

CH-1 : REVISION OF BASIC PYTHON

Programming fundamentals, condition and looping statements, strings, lists, dictionary, Tuples and related functions

CH-8 : RELATIONAL DATABASE AND SQL

Introduction to database, DDL commands, DML commands, DCL commands and SQL aggregate functions

CH-2 : FUNCTIONS

Scope and parameters, functions using libraries (math and string functions), user defined functions

TERM-I

CH-7 : COMPUTER NETWORKS AND ITS CONCEPTS

CH-9 : INTERFACE PYTHON WITH SQL

Creating database connectivity, creation of cursor and its execution, fetchone ( ), fetchall ( ), rowcount ( ) functions

UNIT–II

CH-3 : USING PYTHON LIBRARIES

CH-4 : DAT FILE HANDLING

Need of a data file, text file, binary file, csv file, various file operations, open, close append, update modes and its operations

TERM-2

CH-6 : DATA STRUCTURES IN PYTHON

Pop, push methods using lists

Insert delete methods using queue

SUBJECT : BIOLOGY

TERM-I						
Chapters	**Topics**	**Sub Topics of the Chapter**	**Value**	**Learning Outcomes**	**Proposed Activities (To be done in school)**	**Proposed Activities (To be done home for revision)**
Ch-1 Sexual reproduction in flowering plants	**Flower structure :** development of male and female gametophytes : pollination – types, agencies and examples; out breeding devices; pollen-pistil interaction : double fertilization; post-fertilization events – development of endosperm and embryo development of seed and formation of fruit; special modes – apomixis parthenocarpy, polyembryony; Significance of seed dispersal and fruit formation.	• micro-sporogenesis • megasporo-genesis • pollen sacs • structure of micros-porangium • structure of pollen grain • megasporo-genesis • structure of anatropous ovule. • formation and structure of embryo sac. • pollination and its types. • emas-culation and bagging. • double fertilization • endosperm formation • monocot and dicot embryo • albuminous seeds and exalbuminous seeds	Students will be able to understand the concept of variations amongst plants and causes behind it.	To enable students to : 1. State the structure & function of the floral parts including : Sepal, petal, stamen, carpel. 2. State that the Pollen grain produces male gamete and define the terms : pollination, self-pollination with Outline methods of pollination including : cross-pollination & self-pollination. 3. Explain various techniques of outbreeding devices. 4. State that the Emrbyo sac produces an egg cell & polar nuclei.	1. To study temporary mount of pollen germination on stigma. 2. Emascu-lation and bagging	1. Collect five seeds of monocots and dicots. 2. Germinate at two types of seeds and study their plants. 3. Collect any three flowers and study their pollination types.

		• partheno-carpic fruits • apomixix • polyembry-ony • significance of seed dispersal and fruit formation		5. Define the term : fertilisation. 6. Outline seed structure & function of following; testa, plumule, radicle, embryo, cotyledon 7. Explain development of embryo and seed, & food supply (endosperm or seed leaves) 8. Classify plants as monocotyledon or dictoyledon & distinguish between them. 9. Make reference to non-endosper mic seed. 10 Outline fruit formation. Outline seedless fruit production. 11. Define the term dormancy. State advantages of dormancy. 12. Explain importance of apospory for hybrid seed production.		

				13. Draw well labelled diagrams of mega sporangium, micro-sporangium, various stages of mega micro-sporogenesis, development of embryo and structure of seed		
Ch-2 Human Reproduction	• Male and Female Reproductive Systems • Menstrual Cycle and Gameto-genesis • Fertilization and implantation • Pregnancy and embryonic development • Parturition and lactation	The process of gamete formation • the hormonal control of the menstrual cycle • fertilization, implantation, embryonic development • birth, and postnatal care. – The chapter also discusses reproductive health issues such as STDs, infertility, and - conctra-ception, and explores the challenges of	The study of human reproduction on not only imparts knowledge about the bilogical aspects of reproduction but also helps in understanding the ethical, social, and cultural dimensions of human sexuality and reproduction. The following are some of the values that can be learnt from the chapter.	• Understand the structure and functions of the male and female reproductive systems • Describe the process of gametogenesis and menstrual cycle • Explain the process of fertilization and implantation • Understand the stages of embryonic development and the process of parturition and lactation	1. To study permanent stained slides of T.S of testis and T.S of ovary. 2. To study permanent stained side of T.S of blastula.	1. Make a colourful chart showing various stages of menstrual cycle. 2. Make a chart of comparison of spermat-genesis and oogenesis.

		population growth and the measures that can be taken to control it.				
Ch-3 Reproductive Health	• Reproductive health Sexually transmitted diseases (STDs) • Infertility and assisted reproductive technologies (ART) • Population control • reproductive health issues such as STDs, infertility and • contraception, and explores the • challenges of population growth and the measures that can be taken to control it.	The following are some of the values that can be learnt from the chapter; **Respect for diversity :** The chapter highlights the variations in the human reproductive system and emphasizes the importance of respecting individual differences. **Responsibility:** The discussion on reproductive health and birth control measures highlights the need for responsible sexual behaviour and decision-making. **Gender equality :** The chapter	This chapter not only imparts knowledge about reproduction the biological aspects of repproductive solutions. It discusses the importance of population control and different birth control methods available to individuals. The chapter also discusses the legal aspects of Medical Termination of Pregnancy (MTP), including the conditions under which it can be done and the responsibilities of the medical practitioners. The section on STIs covers the types of	• Awareness of the different methods of contraception and their advantages and disadvantages, and the importance of making informed choices about contraception. • Knowledge of the legal and ethical apsects of medical termination of pregnancy (MTP), including the conditions under which MTP can be performed and the responsibilities of medical practitioners		

		stresses the equality of men and women in reproductive roles, with an emphasis on the role of men in birth control and family planning. **<u>Empathy :</u>** The chapter emphasizes the Sexually Transmitted Infections (STIs) Infertility and assisted reproductive technology (ART) Social issues related to reproductive health, including sex education, female foeticide, and maternal and child health. The chapter explores the various reproductive health problems and their		in providing safe and legal MTP services. • Under-standing the causes of infertility and the different treatment options avaiable for couples struggling with		

Ch-4 Principles of Inheritance and Variations	Mendelian Inheritance Deviations from Mendelism – Incomplete dominance Co-dominance Multiple alleles Inheritance of blood groups Pleiotropy Elementary idea of polygenic inheritance Chromosome theory of inheritance Chromosomes and genes Sex determination in- Humans Birds Honey Bee Linkage and crossing over Sex linked inheritance – Haemophilia Colour Blindness Mendelian disorder in humans Thalassemia Chromosomal disorders in humans –	• principle of dominant and recessive traits and the concept of homozygous and heterozygous alleles. • The inheritance patterns of traits controlled by a single gene, including complete **Scientific temper :** The chapter dominance, -incomplete dominance, and co-dominance -Down syndrome and -Turner syndome. It also discusses genetic counselling and the ethical issues related to genetic testing.	**1. Appreciation for the diversity of life :** The study of inheritance patterns shows the incredible diversity of traits that can be found in different species, as well as the variation importance of understanding the physical and emotional changes that occur during pregnancy, child birth, and postnatal care. **Sensitivity :** The chapter emphasizes the need for sensitivity and confidentiality while dealing with issues related to reproductive health. **Ethical considerations:** The chapter highlights the ethical considerations involved in	• Understand the basic principles of Mendelian inheritance • Describe the chromosome theory of inheritance • Explain the molecular basis of inheritance Identify and describe various genetic disorders within a species. This can lead to appreciation of the beauty and complexity of the natural world. 2. Understanding of scientific inequiry : The work of Gregor Mendel and other scientists in the field of genetics exemplifies the scientific method,	1. Study of Dihybrid Cross : In this practical, students can study the inheritance of two different traits using a dihybrid cross. By observing the phenotypic ratio of the offpsring, students can understand mysteries of the natural world,	1. Study any 2-inherited characteristics in people around you.

	Down's syndrome Turner's Klinefelter's syndromes			including hypothesis testing, data collection, and analysis. This chapter can teach students the importance of scientific inequiry.		the law of independent assortment and the inheritance pattern of the two traits. 2. Study of Genetic Disorders : This practical involves the study of genetic disorders and their inheritance pattern. By analyzing pedigree charts and identifying the mode of inheritance of a particular disorder, students can understand the mechanisms of genetic inheritance and the importance of genetic counselling.

Ch-5 Molecular basis of Inheritance	Search for genetic material and DNA as genetic material Structure of DNA and RNA DNA packaging DNA replication Central dogma Transcription, genetic code, translation Gene expression and regulation – Lac Operon Genome and human ganeome project DNA fingerprinting	**1. DNA structure :** The structure of DNA, the molecule that carries genetic information, is crucial to understanding how genetic information is passed from one generation to the next. **2. DNA replication :** process is the key to cell division and the reproduction of genetic material. **3. DNA transcription:** Transcription is the process by which the information encoded in DNA is used to create RNA, which can then be used to make proteins. **4. Translation:** Translation is the process by	1. Understanding genetic information : The molecular basis of inheritance helps us understand how genetic information is stored and transmitted from one generation to the next. 2. Advancement in medicine : Understanding the molecular basis of genetic diseases can help us develop better diagnostic tools, therapies, and treatments for genetic disorders. 3. Advancement in biotechnology. 4. Understanding the molecular	Understanding the molecular basis of inheritance helps us understand how evolution occurs and how species adapt to changes in their environment. 6. Personalized medicine: The molecular basis of inheritance is used in personalized medicine, where genetic testing is used to predict an individual's susceptibility to certain diseases and to develop tailored treatment. 7. Agriculture: Understanding the molecular basis of		

		which RNA is used to make proteins, which are the molecules that perform most of the functions in living cells. **5. Genetic code :** The genetic code is the set of rules that governs how the information is DNA is translated into proteins. **6. Gene regulation :** The regulation of gene expression is crucial to the development and function of living organisms, and is controlled by a complex network of regulatory molecules. **7. Genetic variation :** The variation in DNA sequences is what makes each individual unique, and understanding	basis of inheritance has led to the development of biotechnology, including genetic engineering, gene therapy, and DNA sequencing technologies. 5. Evolution : 6. Forensic science; The molecular basis of inheritance is used in forensic science to identify suspects in criminal investigations and to establish paternity.	inheritance is important in agriculture, as it can help breeders develop new crop varieties with desired traits.		

		the mechanisms of genetic variation is important in fields such as genetics, evolution, and medicine. **8. Epigenetics:** Epigenetic modifications are changes to DNA that do not alter the				
Ch-6 Evolution	1. Origin of life 2. Biological evolution and evidences for biological evolution (Paleontological, compartive anatomy, embryology and molecular evidence) 3. Darwin's contribution 4. Modern Synthetic theory of Evolution 5. Mechanism of evolution – 1. Variation (Mutation and Recombination) 2. Natural Selection with examples 3. Types of natural selection	1. The origin and history of life on Earth. 2. Darwin's theory of evolution by natural selection. 3. Evidence for evolution, including fossil record, 4. comparative anatomy, and molecular biology 5. Mechanisms of evolution, including genetic drift, gene flow, mutation, and natural selection 6. The Hardy-Weinberg principle and genetic equilibrium	1. Understanding the diversity of life : The chapter Evolution emphasizes the data that all living organisms on the earth have evolved over time through the process of natural selection, and it has led to the enormous diversity of life forms we see today. This concept helps students appreciate the diversity of life and develop a deeper understanding	**1. Understanding the concept of evolution :** Students will learn about the basic concept of evolution and how it relate to the diversity of life on Earth. **2. Understanding the evidence for evolution :** Students will learn about the various lines of evidence that support the theory of evolution, including the fossil record, bio-geography, comparative anatomy, and molecular biology.	**1. Natural Seelection Simulation :** Students can participate in a simulation activity that demonstrates the concept of natural selection. They can be divided into different groups representing different traits and placed in different environments. The activity helps students understand how natural selection works and how it leads to the evolution of traits.	**1. Bio-geography :** Students can analyze the distribution of different specie around the world and identify patterns. This activity helps students understand the concept of biogeography and how it supports the theory of evolution.

	6. Gene flow and genetic drift 7. Hardy-Weinberg's principle 8. Adaptive Radiation 9. Human evolution	7. Types of natural selection, including directional, stabilizing, and disruptive selection 8. Speciation, its factors 9. Evolution of human beings, including the evolution of primates and hominids, and the origin of modern humans 10. The role of evolution of the development of drug resistance in bacteria and other organisms 11. The importance of conservation biology and the impact of human activities on evolution and biodiversity.	of the living world. 2. Critical thinking : The chapter Evolution requires students to think critically and analyze evidence that supports the theory of evolution. It helps students develop their analytical and critical thinking skills by examining scientific evidence, analyzing data, and evaluating arguments. 3. Scientific inquiry : The chapter Evolution emphasizes the scientific inquiry process, where students learn to ask questions, formulate hypothesis, design experiments, and interpret data. It helps students learn how to apply	**3. Understanding the mechanisms of evolution :** Students will learn about the mechanisms of evolution, including natural selection, genetic drift, gene flow, and mutation. **4. Understanding the role of natural selection :** Students will learn how natural selection is a driving force of evolution, leading to the adaptation of organisms to their environments. **5. Understanding the impact of human activities on evolution :** Students will learn about how human activities, such as habitat destruction, climate change, and pollution, are	teaching of evolution in schoolos, the impact of human activities on evolution, or the ethics of genetic engineering. This activity helps students develop their critical thinking and argumentation skills while also exploring the social and ethical implications of evolution skills, including critical thinking, data analysis, and hypothesis testing, through the examination of evidence for evolution. **7. Appreciating the history of evolutionary thought :** Students will learn about the history of evolutionary thought, including the contributions	

			scientific inequiry to real-world problems. 4. Respect for evidence-based reasoning : The chapter Evolution emphasizes the importance of evidence-based reasoning and scientific principles in understanding the natural world. It helps students appreciate the value of scientific evidence and to distinguish between	affecting the evolution of species. **6. Developing scientific skills :** Students will develop their scientific skills, including critical thinking, data analysis, and hypothesis testing, through the examination of evidence for evolution. **7. Appreciating the history of evolutionary thoughts :** Students will learn about the history of evolutionary thought, including the contributions of Charles Darwin and Alfred Russel Wallace, and how the theory of evolution has developed over time.	of Charles Darwin and Alfred Russel Wallace, and how the theory of evolution has developed over time.	

Ch-7 Human Health and Diseases	• Pathogens • parasites causing human diseases – Malaria, Filariasis, Ascariasis, Typhoid, Pneumonia, Common cold, Amoebiasis, Ring worm • Basic concepts of immunology • Vaccines – - HIV - AIDs - Adolescence - drug and alcohol abuse	• Common Diseases : Such as bacterial, viral, and fungal infections, and non-communicable diseases like cancer and diabetes. • Immuno-logy: immune system and its functions, including the recognition and elimination of foreign pathogens - the role of white blood cells, and the production of antibodies. • **HIV/AIDS :** the human immuno-deficiency virus (HIV) and the acquired immuno-deficiency syndrome (AIDS), including the mode of transmission,	Health Awareness : The chapter emphasizes the importance of health awareness and encourages students to adopt healthy lifestyle choices. Students are encouraged to learn about the various contribute to good health, such as proper nutrition, exercise, and stress management. Personal Responsibility : The chapter emphasizes the importance of personal responsibility in maintaining good health. Students are encouraged to take responsibility for their own health and well-being by making informed choices and taking appropriate	**Understand the various types of diseases :** Students will learn about the different types of diseases that affect humans, including infectious and non-infectious diseases. They will also understand the causes, symptoms, and treatment of these diseases. **Understand the immune system :** Students will gain an understanding of the immune system and its role in protecting the body against diseases. They will learn about the different types of immune cells and their functions, including the production of antibodies	**To study the specimens of:** Common disease causing organisms like Ascaris, Entamoeba, Plasmodium, Roundworm through permanent slides or specimens. Comment on symptoms of disease that they cause.	To study the medical card of themselves in which various vaccines are mentioned that they were given in their early childhood stage - Diseases for which these injections were given and purpose behind it.

		symptoms, and prevention. • **Cancer :** T different types of cancer, their causes, risk factors, diagnosis, and treatment • Drug and Alcohol Abuse; the use and abuse of drugs and alcohol and their effects on the body, including addiction, dependence, and withdrawal. • **Mental Health :** This section covers mental health disorders, including depression, anxiety, bipolar disorder, and schizo-phrenia, and their causes, symptoms, and treatment	measures to prevent disease. Compassion and Empathy : The chapter emphasizes the importance of compassion and empathy towards those who are suffering from illness or disease. Students are encourage to understand the challenges faced by individuals with health issues and to treat them with respect and dignity. Respect for Medical Professionals : The chapter highlights the important role played by medical professionals in promoting health and preventing disease.	**Understand the causes and prevention of diseases :** Students will learn about the various factors that contribute the development of diseases, such as genetic, environmental, and lifestyle factors. They will also learn about the various measures that can be taken to prevent the spread of diseases. **Understanding the importance of public health:** Students will gain an understanding of the importance of public health measures in preventing the spread of disease. They will learn about the role of public health officials in promoting health and		

		• **Health and Medicine :** This section covers the role of public health in promoting health and preventing disease, including vaccination programs, sanitation, and hygiene. It also covers the different types of medical practitioners and their roles, including doctors, nurses, and other healthcare professionals. • **Personal and Social Health :** This section cover the importance of personal and social health.		preventing disease outbreaks. **Understanding the importance of medical professionals:** Students will gain an understanding of the important role played by medical professionals.		

Ch-8 Microbes in Human Welfare	In household food processing Industrial production Sewage treatment Energy generation and as bicontrol agents Biofertilizers Antibiotics - Production and judicious use	Types of microbes, their structure, and their importance to humans, Microbes in Household Products : This section explores the use of microbes in household products such as food, beverages, and cosmetics. Microbes in Industrial Products : This section covers the use of microbes in the production of industrial products such as alcohol, antibiotics, and enzymes. **Microbes in Sewage Treatment :** This section explains how microbes are used to treat sewage and other waste products.	1. Nutrient cycling : Microbes play a crucial role in nutrient cycling by decomposing organic matter and releasing nutrients such as nitrogen, phosphorus, and sulfur back into the soil. This helps in maintaining the fertility of the soil and promoting plant growth. 2. Biogas production : Certain microbes such as methanoge nic bacteria are used to produce biogas from organic waste material. Biogas is an eco-friendly and renewable source of energy that can be used for cooking, lighting, and generating electricity.	Understanding the role of microbes in nutrient cycling and soil fertility. Identifying the various types of microbes used in biogas production and their importance in generating renewable energy. Exploring the process of antibiotic production by microbes and understanding the use of antibiotics to treat bacterial infections. Describing the production of enzymes by microbes and their use in industrial processes. Analyzing the use of microbes in sewage treatment and their significance in maintaining		Make a chart of various microbes, write their kind, sources and use.

		Microbes in Biogas Production : This section explores how microbes are used in the production of biogas from organic waste. **Microbes in Biocontrol :** This section covers the use of microbes in biocontrol, which involves the use of one organism to control the growth or behaviour of another organisms. **Microbes in Agriculture :** This section explores the use of microbes in agriculture, including the use of biofertilizers and biopesticides. **Microbes as Biothera-peutics :** This section covers the use of	3. Production of antibiotics : Many antibiotics are produced by microbes such as bacteria and fungi. These antibiotics are used to treat bacterial infections in humans and animals. 4. Production of enzymes : Microbes are used to produce enzymes that are used in various industrial processes such as brewing, baking and cheese making. 5. Sewage treatment : Microbes are used to treat sewage and waste waster by breaking down organic matter and removing pollutants. This helps in maintaining the cleanliness of the	the cleanliness of the environment. Understanding the process of fermentation and the role of microbes such as yeast in producing various food and beverage products.		

		microbes as biotherapeutics, including the use of probiotics and other microbial therapies.	environment and preventing the spread of diseases. 6. Furmentation : Microbes such as yeast are used in fermentation to produce alcoholic beverages such as beer and wine. They are also used to produce bread and other fermented food products.			
Ch-9 Biotechnology Principles and Processes	1. Intro-duction to biotechnology principles and processes 2. Steps involved in genetic engineering (isolation of DNA, amplification of DNA, cloning, etc.) 3. Appli-cations of genetic engineering (production of genetically modified organisms,	Recombinant DNA technology tools. Restriction enzymes. DNA ligases Palindromes. Recognition sequence Restriction sites. Recombinant DNA GEAC and its role.	**• <u>Improving human health:</u>** Biotechnology can be used to produce vaccines gene therapies and personalized medicines that can improve human health and treat diseases. **• <u>Increasing agricultural productivity :</u>** Biotechnology can be used to develop genetically modified	**<u>Promise sustainability:</u>** Biotechnology can be used to develop sustainable agriculture practices that reduce the use of pesticides and fertilizers conserve water resources and minimize soil erosion. **• <u>Creating economic opportunities:</u>** Biotechnology can create jobs and economic	Isolation of DNA from available plant material such as spinach green pea seeds, papaya, etc.	Make raw material of different kind of fresh substance from home for the practical of DNA isolation.

	gene therapy, etc.) 4. DNA fingerprinting and its applications		crops that are more resistant to pests and diseases, have higher yields, and are more nutritious. **• Advancing scientific knowledge:** Biotechnology research can help advance our understanding of genetics, molecular biology, and other fields of science.	growth through the development of new products and technologies, such as bio-pharmaceuticals and biofuels.		
Ch-10 Bio-technology and its Applications	Application of Biotechnology in health and agriculture – Human insulin and vaccine production, gene therapy Genetically modified organisms – Bt crops Transgenic Animals : biosafety issues, biopiracy and patents	RNA interference Mechanism of genetic engineering Artificial insulin Uses of genetic engineering in medicinal industry Gene thearpy Biopatent and biopiracy.	**1. Scientific inquiry :** Biotechnology is baed on the principles of scientific inquiry, experimentation and observation. Students learn to think critically and scientificially in order to understand how biotechnology works and how it can be applied to real-world problems.	**Innovation :** Biotechnology is a rapidly evolving field that is constantly pushing the boundaries of what is possible. This chapter highlights the importance of innovation and creativity in biotechnology research, as well as the need to stay up-to-date with the latest scientific and technological advances.		Make a project of about 15 pages handwritten to board practice exams.

			2. Ethical considerations: Biotechnology has enormous potential for improving human health and the environment, but it also poses ethical challenges. Students are encourage to think about the ethical implications of biotechnology and to consider the potential risks and benefits of its applications. **3. Collaboration:** Biotechnology is a highly interdisciplinary field, requiring collaboration among scientists, engineers, and other professionals from different backgrounds. This chapter emphasizes the importance of collaboration	**5. Global awarness :** Biotechnology has global implications, with many of its applications having the potential to impact people and the environment around the world. This chapter encourages students to think about the global implications of biotechnology and to consider how its applications can be used to address global challenges.		

			and teamwork in biotechnology research and development.			
Ch-11 Organisms and Populations	Population interactions : mutualism, competition, predation, parasitism : population attributes - growth, birth rate and death rate, age distribution. (Topics excluded : Organism and its Environment. Major Abiotic Factors Responses to Abiotic Factors, Adaptations)	1. Introduction to the concept of ecology 2. Habitat and niche, adaptations and organisms 3. Population and community 4. Population growth 5. Growth curves and population growth models 6. Life history patterns and population growth rate 7. Biotic potential and environmental resistance 8. Population interactions : 1. Interspecific interactions (competition, predation, mutualism, commensalism, etc.) 2. Intraspecific interactions (cooperation, conflict, territoriality, etc.)	1. Appre-ciation for biodiversity; Studying organisms and population can help students appreciate the diversity of life forms and their inter-relatoinships. This can promote a deeper understanding and respect for nature and its intricate balance. 2. Environmental awareness : Learning about organisms and population can help students understand the impact of human activities on the environment and the importance of conservation and sustainable	1. Inter-disciplinary approach : Organisms and population involved an inter-disciplinary approach, drawing from biology, ecology, environmental science, and social sciences. This can help students develop a more holistic and integrated approach to problem-solving and decision-making. 2. Scientific inquiry and critical thinking : Studying organisms and population can develop students' scientific inquiry and critical thinking skills,	1. Study the plant population density by quadrant method. 2. Study the plant population frequency by quadrant method.	Make a table explaining the different kind of interactions amongst various organisms, giving an example of each.

		3. Adaptations for survival in inter and intraspecific interactions. 1. Organisms and its Environment 2. Habitat and Niche 3. Population and ecological adaptations 4. Population growth 5. Population interactions 6. Biotic potential and environmental resistance 7. Ecological succession 8. Ecosystem - components and types 9. Energy flow, 10. Ecological pyramids	development. This can foster environmental awareness and a sense of responsibility towards protecting the environment. 3. Ethical and responsible behaviour. Studying the impact of human population growth on the environment and the need for sustainable development can encourage students to adopt ethical and responsible behaviour in their personal and professional lives.	as they learn to analyze complex data, develop hypotheses, and test theories. 3. Life Skills : Studying organisms and population can help develop students' life skills, such as teamwork, communication, and leadership, as they collaborate on group projects and participate in disussions and debates.		
Ch-12 Ecosystem	Ecosystems : Patterns, components; productivity and decomposition; energy flow; pyramids of number, biomass, energy (Topic excluded : Ecological	1. Introduction to Ecosystem 2. Structure and Function of an Ecosystem 3. Productivity of Ecosystem 4. Decompo-sition 5. Energy Flow 6. Ecological Pyramids	1. Ecological value : Ecosystems provide habitat and food for various species of flora and fauna. They also regulate the climatic conditions,	1. Understand the concept of an ecosystem and its components. 2. Explain the structure and function of an ecosystem. 3. Describe the processes of nutrient cycling in an	1. Comment upon the morphological adapations of plants found in xerophytic conditions. 2. To study the specimens of hydrphytic and xerophytic plants and animals.	Make a project of about 15 pages handwritten to board practical exams.

		7. Nutrient Cycling 8. Ecosystem Services 9. Terrestrial Ecosystems 10. Aquatic Ecosystems 11. Global Ecological Issues	maintain the soil structure and sustain the nutrient cycle. 2. Economic value : Ecosystems provide resources such as timber, fish, and water that can be utilized by humans for economic gains. 3. Re-creational value : Ecosystems provide source of recreation and tourism activities such as camping, hiking, and bird watching. 4. Aesthetic value : Ecosystems provide natural beauty and inspire artistic and cultural values. 5. Ethical value : Ecosystems have inherent value, and their preservation is necessary for the protection of biodiversity	4. Understand the different types of ecological pyramids and their significance. 5. Discuss the importance of decomposition and how it contributes to the nutrient cycle. 6. Analyze the factors affecting the productivity of an ecosystem. 7. Explain the different types of terrestrial and aquatic ecosystems. 8. Understand the ecological services provided by ecosystems and their importance. 9. Discuss the global ecological issues and their impact on ecosystems. Develop an appreciation for the values of ecosystems, including ecological,		

			and the balance of natural world.	economic, recreational, aesthetic, and ethical values.		
Ch-13 Biodiversity and Conservation	Biodiversity-Concept, patterns, importance; loss of biodiversity; biodiversity conservation; hotspots, endangered organisms, extinction, Red Data Book, Sacred Groves, biosphere reserves, national parks, wildlife sanctuaries	1. Introduction to the concept of biodiversity 2. Levels of biodiversity (genetic, species, and ecosystem) 3. Threats to biodiversity (habitat loss, pollution, climate change, over exploitation, etc.) 4. Conservation of biodiversity (in situ and ex situ conservation, biosphere reserves, national parts, etc.)	1. Ecological value : Biodversity plays a vital role in maintaining the balance of ecosystems. The loss of even a single species can have a ripple effect on the entire ecosystem. 2. Economic value : Biodiversity provides a range of products and services that are essential for human well-being, including food, medicine, timber, and tourism. 3. Social value : Bio-diversity is an intergal part of cultural traditions, and its loss can lead to a loss of cultural heritage.	1. Understand the concept of biodiversity, its types, and its importance in maintaining the balance of ecosystems. 2. Understand the economic, ecological, social, and ethical values of biodversity. 3. Understand the major threats to biodiversity such as habitat loss, climate change, pollution and over exploitation of resources. 4. Understand the different conservation measures such as in-situ and ex-situ conservation, protected areas, and the role of international treaties and conventions in biodiversity conservation.	1. Group projects : Students may work in groups to research and present on different conservation measures such as in-situ and ex-situ conservation, protected areas, and the role of international treaties and conventions in biodiversity conservation; 2. Data analysis : Students may use data sets to analyze the impact of human activities on biodiversity and evaluate the effectiveness of different conservation strategies. 3. Role-play : Students may participate in role-playing	Presentations: Students may prepare and deliver presentations the importance of biodiversity conservation and the role of individuals and societies in addressing biodiversity loss. Make a project of about 15 pages handwritten in board practical exams.

			4. Ethical value : All species have an inherent right to exist, and it is our moral responsibility to protect them. 5. Conservation measures : The chapter discusses various	5. Develop an appreciation for the importance of preserving biodiversity and the impact of human activities on	activities to understand the perspectives of different stakeholders in biodiversity conservation, such as government agencies, NGOs, and local communities. 4. Debates : Students	