Shobhit University
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School of Agriculture and Environmental Sciences

B.Sc. Agriculture (Honors)

Program Outcomes, Program Specific Outcomes & Course Outcomes
(POs, PSOs & COs)

Program Outcomes

Program Outcome		Statement
PO 1	Knowledge Application	Demonstrate a comprehensive understanding of agricultural sciences, including plant and animal biology, soil science, and agricultural engineering.
PO 2	Research Skills	Conduct research using scientific methods, including data collection, analysis, and interpretation, to solve agricultural problems.
PO 3	Sustainable Practices	Promote sustainable agricultural practices that enhance productivity while preserving environmental health and biodiversity.
PO 4	Technical Proficiency	Utilize modern agricultural technologies and tools for efficient farming practices, including precision agriculture and biotechnology.
PO 5	Critical Thinking	Analyze and evaluate agricultural policies, practices, and issues critically, fostering informed decision-making.
PO 6	Communication Skill	Communicate effectively, both verbally and in writing, to diverse audiences, including farmers, policymakers, and the general public.
PO 7	Teamwork and Leadership	Work collaboratively in teams, demonstrating leadership skills in agricultural projects and initiatives.
PO 8	Economic Understanding	Understand the economic principles related to agricultural production, marketing, and management.
PO 9	Ethics and Responsibility	Uphold ethical standards in agricultural practices, considering social responsibilities and the impact on communities.
PO 10	Lifelong Learning	Foster a commitment to continuous learning and professional development in the agricultural sector
PO 11	Livestock and Dairy Management	Fundamental knowledge of animal husbandry, poultry farming, and dairy production.
PO 12	Soil and Water Management Skills	Ability to analyze soil properties, manages fertility, and implements sustainable irrigation techniques for improved crop yield.

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Program Specific Outcomes (PSOs)

Program Specific Outcome	Statement
PSO 1	To impart a strong foundation in agricultural science, including plant biology, soil science, and animal husbandry.
PSO 2	To develop practical skills through hands-on training in farming techniques, crop management, and animal care.
PSO 3	To encourage students to engage in research and innovation to address contemporary agricultural challenges, such as food security and sustainable farming.
PSO 4	To promote sustainable agricultural practices that protect the environment and enhance productivity.
PSO 5	To familiarize students with the latest agricultural technologies, including precision farming, biotechnology, and data analytics.
PSO 6	To provide insights into agricultural economics, marketing, and policy, enabling students to make informed decisions in the agricultural sector.

Course Outcomes (COs)

1st Semester

Course: Fundamentals of Horticulture

Course Outcomes	Statement
CO 1	CO-1 Understanding Horticulture Basics: Define horticulture and its importance in agriculture and daily life. Differentiate between horticulture and other branches of plant science.
CO 2	CO-2 Introduction to Horticultural Crops: Familiarize with various horticultural crops, including fruits, vegetables, flowers, and ornamental plants. Learn the classification of horticultural plants based on their growth habits, lifecycle, and economic importance.
CO 3	CO-3 Environmental Factors and Plant Growth: Understand the influence of light, temperature, water, soil, and nutrients on the growth and development of horticultural crops. Study the effects of biotic and abiotic stresses on horticultural plants.
CO 4	CO-4 Horticultural Practices: Learn the basic principles of plant propagation, including sexual and asexual methods. Understand the basics of nursery management, pruning, training, and crop management
CO 5	CO-5 Soil and Water Management: Explore soil preparation techniques for horticultural crops. Study the importance of irrigation, drainage, and water conservation techniques.

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CO 6	CO-6 Plant Nutrition and Health: Learn about fertilizers, manures, and their application in horticulture. Understand integrated pest and disease management practices.
CO 7	CO-7 Economic and Aesthetic Value of Horticulture: Recognize the role of horticulture in improving economic well-being and environmental sustainability. Study the use of ornamental plants in landscaping, floriculture, and urban gardening.
CO 8	CO-8 Sustainability and Modern Techniques: Introduce sustainable horticultural practices such as organic farming and precision horticulture. Familiarize with advancements in biotechnology, tissue culture, and protected cultivation (e.g., greenhouses, playhouses)

Course: Fundamentals of Plant Biochemistry and Biotechnology

Course Outcomes	Statement
CO 1	CO-1 Understand Plant Biochemical Processes: Develop a foundational understanding of the biochemical processes and pathways that drive plant growth, development, and metabolism.
CO 2	CO-2 Explore Plant Metabolism: Analyze the roles of primary and secondary metabolites in plants, including their synthesis, regulation, and functional significance.
CO 3	CO-3 Study Enzymatic Mechanisms: Learn the principles of enzymatic reactions and their applications in regulating plant physiological and biochemical processes.
CO 4	CO-4 Integrate Biochemistry and Biotechnology: Explore the intersection of plant biochemistry with modern biotechnological tools for crop improvement, disease resistance, and sustainable agriculture.
CO 5	CO-5 Apply Molecular Biology Tools: Gain proficiency in molecular techniques such as gene cloning, CRISPR, and recombinant DNA technology for studying and manipulating plant systems.
CO 6	CO-6 Evaluate Plant Stress Responses: Understand biochemical mechanisms plants use to respond and adapt to biotic and abiotic stresses, and how these can be managed through biotechnology.
CO 7	CO-7 Promote Sustainable Practices: Apply biotechnological advances to improve agricultural productivity, reduce environmental impact, and address global challenges like food security and climate change.

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Course: Fundamentals of Soil Science

Course Outcomes	Statement
CO 1	CO-1 Understand Soil Formation and Properties: Develop an understanding of the processes of soil formation, including physical, chemical, and biological factors, and identify key soil properties that influence its classification and use.
CO 2	CO-2 Analyze Soil Components: Examine the composition of soil, including minerals, organic matter, water, and air, and explain their roles in supporting plant growth and maintaining ecological balance.
CO 3	CO-3 Explore Soil Classification Systems: Learn to classify soils based on their physical, chemical, and biological properties using standard classification systems such as Soil Taxonomy or FAO guidelines.
CO 4	CO-4 Study Soil-Water Relationships: Investigate the movement, retention, and availability of water in soils and its impact on plant growth and agricultural productivity.
CO 5	CO-5 Understand Soil Nutrients and Fertility: Analyze the role of essential soil nutrients, nutrient cycles, and soil amendments in maintaining soil fertility for sustainable agricultural practices.
CO 6	CO-6 Evaluate Soil Degradation and Conservation: Identify the causes and consequences of soil degradation, including erosion, salinization, and pollution, and propose soil conservation strategies to enhance sustainability.
CO 7	CO-7 Apply Soil Science to Environmental Issues: Explore the role of soil in addressing global environmental challenges, such as carbon sequestration, waste management, and ecosystem restoration.

Course: Introduction to Forestry

Course Outcomes	Statement
CO 1	CO-1 Understand the Basics of Forestry: Explain the definition, history, and importance of forestry in ecological and economic contexts.
CO 2	CO-2 Explore Forest Ecosystems: Identify the components of forest ecosystems, including flora, fauna, soil, and climate interactions.
CO 3	CO-3 Comprehend Forest Management Practices: Analyze sustainable forest management principles and practices, including conservation, afforestation, and silviculture techniques.

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CO 4	CO-4 Evaluate Forest Resources and Their Uses: Discuss the economic, recreational, and environmental significance of forest products and services.
CO 5	CO-5 Analyze the Role of Forestry in Climate Change Mitigation: Examine how forests contribute to carbon sequestration, biodiversity conservation, and climate resilience.
CO 6	CO-6 Understand Forestry Policies and Regulations: Assess national and international forestry policies, laws, and their impact on conservation and forest management.
CO 7	CO-7 Develop Skills in Forest Assessment and Monitoring: Practice using tools and techniques for forest inventory, mapping, and monitoring forest health.
CO 8	CO-8 Explore Career Opportunities in Forestry: Discuss various career paths in forestry, ranging from field-based roles to research, policy-making, and environmental advocacy

Course: Comprehension & Communication Skills in English

Course Outcomes	Statement
CO 1	CO-1 Develop Strong Comprehension Skills: Improve the ability to read, understand, and analyze texts, identifying main ideas, themes, and arguments.
CO 2	CO-2 Enhance Vocabulary and Grammar: Expand vocabulary and strengthen grammar usage to enable more effective communication.
CO 3	CO-3 Master Listening Skills: Develop the ability to comprehend spoken English in various contexts, such as lectures, conversations, and media.
CO 4	CO-4 Improve Speaking Abilities: Build confidence and fluency in verbal communication, including presenting ideas clearly and engaging in discussions.
CO 5	CO-5 Refine Writing Skills: Strengthen the ability to write well-structured essays, reports, and creative pieces.
CO 6	CO-6 Increase Cultural Awareness: Understand the nuances of language use in different cultural contexts and improve cross-cultural communication.
CO 7	CO-7 Practice Effective Argumentation: Learn to construct and present well-reasoned arguments, supported by evidence and coherent logic.

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CO 8	CO-8 Enhance Interpersonal Communication: Improve interpersonal communication skills through role-play, debates, and group discussions to foster collaboration and teamwork.

Course: English Grammar-I

Course Outcomes	Statement
CO 1	CO-1 Understand Basic Grammar Concepts: To introduce students to fundamental concepts of English grammar, including sentence structure, parts of speech, and punctuation.
CO 2	CO-2 Enhance Sentence Formation: To develop the ability to construct grammatically correct and varied sentences, with a focus on clarity and coherence.
CO 3	CO-3 Master Verb Tenses: To help students understand and accurately use different verb tenses, including present, past, and future forms, in both simple and continuous aspects.
CO 4	CO-4 Improve Vocabulary and Word Usage: To expand students' vocabulary and guide them in using words appropriately within different grammatical contexts.
CO 5	CO-5 Grasp Subject-Verb Agreement: To teach the rules of subject-verb agreement and how to apply them in diverse sentence structures.
CO 6	CO-6 Learn Sentence Types and Functions: To provide knowledge of different types of sentences (declarative, interrogative, imperative, and exclamatory) and their functions in communication.
CO 7	CO-7 Practice Pronouns and Their Functions: To familiarize students with the correct usage of pronouns, including personal, possessive, and reflexive forms, and how they function in sentences.
CO 8	CO-8 Develop Punctuation Skills: To improve students' understanding and correct usage of punctuation marks (periods, commas, semicolons, colons, quotation marks, etc.) to enhance written communication.

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Course: Soft Skills-I

Course Outcomes	Statement
CO 1	CO-1 Enhance Communication Skills: Develop verbal, non-verbal, and written communication techniques to express ideas clearly and effectively.
CO 2	CO-2 Build Teamwork and Collaboration: Foster the ability to work collaboratively in diverse groups, understanding group dynamics and conflict resolution.
CO 3	CO-3 Improve Time Management: Learn strategies to prioritize tasks, manage time efficiently, and meet deadlines in professional and personal contexts.
CO 4	CO-4 Develop Emotional Intelligence Cultivate self-awareness, empathy, and the ability to manage emotions in interpersonal relationships and challenging situations.
CO 5	CO-5 Strengthen Critical Thinking and Problem-Solving: Encourage analytical thinking to evaluate situations and propose creative, practical solutions.
CO 6	CO-6 Boost Confidence and Public Speaking Skills: Build self-confidence and refine public speaking skills to present ideas effectively in formal and informal settings.
CO 7	CO-7 Cultivate Professional Ethics and Workplace Etiquette: Understand and apply ethical principles and appropriate behavior in professional environments.

Course: Life Management-I

Course Outcomes	Statement
CO 1	CO-1 Self-Awareness Development: Understand personal strengths, weaknesses, values, and goals. Develop emotional intelligence to manage self and relationships effectively.
CO 2	CO-2 Time and Priority Management: Learn strategies for effective time management. Set realistic goals and prioritize tasks to enhance productivity.

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CO 3	CO-3 Stress and Emotional Regulation: Identify sources of stress and implement techniques to manage it. Develop coping mechanisms for emotional well-being.
CO 4	CO-4 Communication Skills: Build effective verbal and non-verbal communication skills. Enhance active listening and interpersonal communication abilities.
CO 5	CO-5 Decision-Making and Problem-Solving: Learn frameworks for making informed decisions. Cultivate problem-solving skills to handle life challenges.
CO 6	CO-6 Work-Life Balance: Understand the importance of balancing personal and professional life. Implement strategies to achieve harmony and avoid burnout.
CO 7	CO-7 Personal Growth and Goal Setting: Set and achieve short-term and long-term personal goals. Develop a growth mindset and strategies for continuous improvement.
CO 8	CO-8 Health and Well-Being: Recognize the importance of physical and mental health. Learn basic wellness practices for a balanced lifestyle.

Course: Fundamentals of Agronomy

Course Outcomes	Statement
CO 1	CO-1 Understanding Crop Growth and Development: Learn about the life cycle of crops and factors influencing their growth. Study the physiological and morphological characteristics of crops.
CO 2	CO-2 Basics of Soil Science: Understand soil properties, classification, and its role in crop production. Learn about soil fertility, nutrient management, and amendments.
CO 3	CO-3 Crop Management Practices: Gain knowledge about crop planting methods, spacing, and cropping systems. Understand weed control, irrigation, and pest management practices.
CO 4	CO-4Climate and Agriculture: Explore the impact of weather and climate on crop production. Study agro climatic zones and their significance in crop planning.
CO 5	CO-5Sustainable Agriculture: Learn principles of sustainable land use, conservation practices, and integrated nutrient management. Focus on resource efficiency and minimizing environmental impact.
CO 6	CO-7Introduction to Agronomic Tools and Techniques: Understand the role of technology and tools in modern agronomy. Familiarize with concepts like precision agriculture and remote sensing.

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CO 7	CO-8Crop Improvement: Basics of crop breeding and genetic enhancement for better yields and resilience.

Course: Introductory Biology

Course Outcomes	Statement
CO 1	CO-1 Understand Core Biological Concepts: Explore the structure and function of cells, including prokaryotic and eukaryotic cells. Examine the molecular basis of life (e.g., DNA, RNA, proteins). Understand energy transformations in biological systems (e.g., photosynthesis and cellular respiration)
CO 2	CO-2 Develop Knowledge of Organismal Biology Learn about the diversity of life and classification systems (taxonomy).Study how organisms grow, reproduce, and interact with their environments. Understand the principles of evolution and natural selection.
CO 3	CO-3 Explore Genetics and Heredity: Learn the basics of Mend Elian and molecular genetics. Understand patterns of inheritance and the role of genetic variation in populations.
CO 4	CO-4. Examine Ecology and Environmental Biology: Study ecosystems, energy flow, and nutrient cycles. Explore the interdependence of organisms and their environments. Understand human impacts on ecosystems and biodiversity.
CO 5	CO-5 Develop Scientific Inquiry Skills: Learn how to design experiments, analyze data, and interpret results. Apply the scientific method to biological questions. Enhance critical thinking and problem-solving skills.
CO 6	CO-6 Prepare for Advanced Biological Studies: Build a foundation for specialized topics in biology, such as microbiology, genetics, and biochemistry. Develop an appreciation for the scope and relevance of biology in everyday life.

Course: Elementary Mathematics

Course Outcomes	Statement
CO 1	CO-1 Develop Number Sense and Operations: To help students understand and apply basic arithmetic operations (addition, subtraction, multiplication, and division) with whole numbers, fractions, and decimals.

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CO 2	CO-2 Introduce Geometric Concepts: To enable students to identify and analyze basic geometric shapes, understand their properties, and explore concepts of symmetry, area, and perimeter.
CO 3	CO-3 Understand Measurement: To teach students how to measure length, weight, volume, and time using both standard and non-standard units of measurement, fostering an understanding of units and conversions.
CO 4	CO-4 Explore Data and Probability: To introduce students to data collection, organization, and representation using graphs (bar charts, pictograms, and line graphs), and basic concepts of probability.
CO 5	CO-5 Introduce Problem-Solving Strategies: To develop students' ability to solve word problems by applying mathematical operations and logical reasoning to everyday situations.
CO 6	CO-6 Enhance Mathematical Communication: To encourage students to articulate mathematical ideas clearly using correct terminology and notation, and explain their thinking through reasoning.
CO 7	CO-7 Promote Critical Thinking: To strengthen students' ability to make logical connections between concepts, recognize patterns, and apply mathematical concepts to real-world contexts.

Course: Fundamentals of Statistics

Course Outcomes	Statement
CO 1	CO-1 Understand Key Statistical Concepts: Explain fundamental statistical concepts, including data types, measures of central tendency, and measures of dispersion.
CO 2	CO-2 Data Collection and Organization: Apply methods for collecting, organizing, and summarizing data using appropriate statistical tools.
CO 3	CO-3 Probability Basics: Understand and calculate probabilities to analyze random events and understand their role in statistical analysis.
CO 4	CO-4 Inferential Statistics: Perform hypothesis testing, confidence interval estimation, and inferential techniques to draw conclusions from data.
CO 5	CO-5 Data Visualization: Construct and interpret graphical representations of data, such as histograms, scatterplots, and boxplots.

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CO 6	CO-6 Statistical Software Utilization: Use statistical software or tools to analyze data effectively and interpret output.
CO 7	CO-7 Real-World Application: Apply statistical methods to solve real-world problems in diverse fields, enhancing decision-making skills.

Course: Statistical Thinking and Data Analysis

Course Outcomes	Statement
CO 1	CO-1 Understand Fundamental Statistical Concepts: Develop a clear understanding of basic statistical terms, principles, and methodologies, including descriptive statistics, probability, and inferential techniques.
CO 2	CO-2 Data Collection and Sampling: Learn appropriate methods for designing experiments, conducting surveys, and collecting data, while understanding the importance of sampling techniques and potential biases.
CO 3	CO-3 Exploratory Data Analysis: Gain proficiency in visualizing and summarizing data using graphical and numerical methods to uncover underlying patterns, trends, and insights.
CO 4	CO-4 Statistical Modeling and Inference: Apply statistical models to make inferences about populations from sample data, focusing on hypothesis testing, confidence intervals, and regression analysis.
CO 5	CO-5 Integration of Computational Tools: Utilize statistical software and programming languages (e.g., R, Python, or Excel) to conduct data analysis efficiently and interpret outputs effectively.
CO 6	CO-6 Decision-Making Under Uncertainty: Develop the ability to apply statistical reasoning to solve real-world problems and support decision-making in uncertain environments.
CO 7	CO-7 Communicating Statistical Findings: Master the art of presenting data analysis results clearly and effectively to both technical and non-technical audiences, emphasizing evidence-based conclusions.

Course: Agricultural Heritage

Course Outcomes	Statement
CO 1	CO-1 Understand Historical Significance: Explore the historical development of agriculture and its impact on human civilization, from ancient practices to modern advancements.
CO 2	CO-2 Recognize Traditional Knowledge: Identify and appreciate the importance of traditional agricultural practices and indigenous

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	knowledge systems in sustaining ecosystems and enhancing crop diversity.
CO 3	CO-3 Evaluate Cultural Contributions: Analyze the cultural, social, and economic contributions of agriculture in shaping societies across different regions and eras.
CO 4	CO-4 Study Agricultural Evolution: Investigate the evolution of farming systems, tools, and techniques in response to changing environmental and social needs.
CO 5	CO-5 Learn Sustainability Principles: Examine historical agricultural practices for their relevance to contemporary issues like sustainability, climate change, and food security.
CO 6	CO-6 Preserve Biodiversity: Highlight the role of agricultural heritage in conserving biodiversity and promoting sustainable resource management.
CO 7	CO-7 Promote Awareness and Application: Encourage the integration of agricultural heritage principles into modern farming to create a balance between tradition and innovation.

Course: Rural Sociology & Educational Psychology

Course Outcomes	Statement
CO 1	CO-1 Understand Rural Society: To explore the structure, functions, and characteristics of rural communities and their role in society.
CO 2	CO-2 Analyze Social Change: To examine the processes and patterns of social change and development in rural areas.
CO 3	CO-3 Study Cultural Practices: To understand the cultural norms, values, traditions, and practices of rural societies.
CO 4	CO-4 Assess Rural Problems: To identify and analyze the challenges faced by rural communities, such as poverty, illiteracy, and unemployment.
CO 5	CO-5 Promote Rural Development: To understand the role of education, policy-making, and technology in enhancing rural life.
CO 6	CO-6 Learn Research Techniques: To equip students with methodologies for conducting sociological research in rural settings.
CO 7	CO-7 Foster Community Engagement: To prepare students to work effectively with rural populations and contribute to community development initiatives.

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Course: Science, Technology, and Society

Course Outcomes	Statement
CO 1	CO-1 Understand Interconnections: Explain the interdependent relationship between science, technology, and society, and how they shape one another.
CO 2	CO-2 Analyze Ethical Implications: Evaluate the ethical, environmental, and social impacts of scientific discoveries and technological advancements.
CO 3	CO-3 Explore Historical Contexts: Examine the historical evolution of science and technology and its influence on societal development.
CO 4	CO-4 Foster Critical Thinking: Develop critical thinking skills to assess the benefits, risks, and unintended consequences of technological innovation.
CO 5	CO-5 Promote Responsible Innovation: Understand the role of individuals, organizations, and governments in fostering responsible science and technology practices for sustainable development.
CO 6	CO-6 Recognize Global Perspectives: Explore the global dimensions of science and technology, considering issues such as equity, accessibility, and cultural diversity.
CO 7	CO-7 Encourage Lifelong Learning: Cultivate a mindset for continuous inquiry into the advancements of science and technology and their potential to address societal challenges

Course: Women's and Gender Studies

Course Outcomes	Statement
CO 1	CO-1 Understand Core Concepts and Theories: Develop an understanding of key concepts, theories, and frameworks in Women's and Gender Studies, including feminism, intersectionality, and social constructionism.
CO 2	CO-2 Analyze Gender and Power Dynamics: Examine the ways gender, sexuality, race, class, and other social categories shape individual experiences and societal structures.
CO 3	CO-3 Critique Social Inequalities: Critically analyze historical and contemporary systems of oppression and privilege, such as patriarchy, sexism, heteronormativity, and colonialism.
CO 4	CO-4 Engage in Interdisciplinary Approaches: Explore how Women's and Gender Studies intersects with fields such as sociology, history, literature, political science, and cultural studies to provide a holistic view of gender-related issues.
CO 5	CO-5 Promote Social Justice and Advocacy: Build skills in activism and advocacy by exploring strategies for promoting equity, inclusion, and social justice on both local and global scales.

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CO 6	CO-6 Evaluate Representations of Gender: Analyze how gender and sexuality are represented in media, literature, and cultural practices, and consider their implications for societal norms and behaviors.
CO 7	CO-7 Apply Knowledge to Real-World Issues: Use the knowledge gained to critically engage with and address real-world issues related to gender, such as gender-based violence, reproductive rights, workplace inequality, and LGBTQ+ rights

Course: Geography of the Global Economy

Course Outcomes	Statement
CO 1	CO-1 Understand the Spatial Dynamics of the Global Economy: Analyze the geographic distribution of economic activities and their interconnectedness at local, national, and global scales.
CO 2	CO-2 Examine Global Trade Patterns: Explore the causes and consequences of international trade, including trade agreements, tariffs, and the role of global supply chains.
CO 3	CO-3 Analyze Economic Inequality: Investigate the spatial dimensions of wealth and poverty, focusing on disparities between and within regions.
CO 4	CO-4 Evaluate the Role of Globalization: Assess the impact of globalization on economic development, cultural exchanges, and the environment.
CO 5	CO-5 Explore Industrial and Technological Change: Study the geographic implications of industrialization, deindustrialization, and the rise of digital economies.
CO 6	CO-6 Investigate Environmental and Economic Interactions: Understand how economic activities influence and are influenced by environmental factors, including climate change, resource extraction, and sustainability practices.
CO 7	CO-7 Develop Geographic Analytical Skills: Utilize tools such as GIS (Geographic Information Systems) and spatial data analysis to interpret and visualize economic patterns and trends.

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Course: Human Values and Ethics

Course Outcomes	Statement
CO 1	CO-1 Understanding Ethical Foundations: To provide students with a comprehensive understanding of the fundamental concepts, principles, and theories of ethics and human values.
CO 2	CO-2 Developing Critical Thinking: To enable students to critically analyze ethical dilemmas and challenges in personal, professional, and societal contexts.
CO 3	CO-3 Fostering Moral Awareness: To cultivate a sense of moral responsibility by identifying and reflecting on the importance of values in decision-making and behavior.
CO 4	CO-4 Promoting Integrity and Accountability: To emphasize the role of integrity, honesty, and accountability in personal and professional life.
CO 5	CO-5 Encouraging Respect for Diversity: To teach students to appreciate and respect diverse perspectives, cultures, and values in a globalized society.
CO 6	CO-6 Enhancing Ethical Decision-Making: To equip students with tools and frameworks to make ethical decisions and resolve conflicts effectively.
CO 7	CO-7 Building Social Responsibility: To inspire students to contribute positively to society by addressing social, environmental, and global ethical challenges.

Course: Global Climate Policy and Sustainability

Course Outcomes	Statement
CO 1	CO-1 Understand the Science of Climate Change: Gain a comprehensive understanding of the scientific principles behind climate change, including its causes, impacts, and implications for natural and human systems.
CO 2	CO-2 Analyze Global Climate Policies: Explore key international agreements and frameworks such as the Paris Agreement, Kyoto Protocol, and IPCC reports, and assess their role in addressing climate change.
CO 3	CO-3 Evaluate Policy Approaches: Compare and contrast policy approaches at global, regional, and national levels, focusing on mitigation strategies, adaptation planning, and policy implementation challenges.

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CO 4	CO-4 Examine Sustainable Development Goals (SDGs): Investigate the interconnections between climate action and the SDGs, emphasizing the need for integrated strategies to achieve sustainability.
CO 5	CO-5 Assess the Role of Stakeholders: Identify the roles of various stakeholders, including governments, businesses, non-governmental organizations, and civil society, in advancing climate policy and sustainability efforts.
CO 6	CO-6 Develop Critical Thinking on Equity and Justice: Analyze issues of climate justice, equity, and inclusivity, focusing on how climate policies affect different communities, particularly vulnerable populations.
CO 7	CO-7 Design Practical Solutions: Equip students with the tools and frameworks to design innovative and practical solutions for climate challenges, fostering sustainable practices in various sectors.

Course: Planetary Change and Human Health

Course Outcomes	Statement
CO 1	CO-1 Understand the Relationship between Planetary Health and Human Health: Explore how changes in natural systems—such as climate change, biodiversity loss, and pollution—impact human health and well-being.
CO 2	CO-2 Identify Key Drivers of Environmental Change: Examine the social, economic, and political factors driving planetary change, including industrialization, urbanization, and resource exploitation.
CO 3	CO-3 Assess the Impacts of Climate Change on Health: Analyze the direct and indirect effects of climate change on human health, such as heat-related illnesses, vector-borne diseases, and food and water insecurity.
CO 4	CO-4 Examine the Role of Biodiversity in Public Health: Investigate how the loss of biodiversity affects ecosystems and the services they provide, including implications for medicine, nutrition, and disease regulation.
CO 5	CO-5 Develop an Understanding of Environmental Justice: Recognize how planetary change disproportionately affects vulnerable populations and contributes to health inequities worldwide.
CO 6	CO-6 Evaluate Adaptation and Mitigation Strategies: Explore strategies to mitigate the adverse effects of planetary change on human health, including policy interventions, technological innovations, and community-based approaches.

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CO 7	CO-7 Promote Interdisciplinary Problem-Solving: Foster collaboration across disciplines to address the complex interconnections between environmental change and human health, integrating insights from public health, environmental science, and social sciences.

Course: Tools for Sustainable Design

Course Outcomes	Statement
CO 1	CO-1 Introduce Sustainable Design Concepts: Provide students with a foundational understanding of sustainability principles and how they apply to design across various disciplines (e.g., architecture, industrial design, product design, urban planning).
CO 2	CO-2 Explore Tools for Sustainable Design: Familiarize students with a variety of design tools, software, and techniques that support sustainable design practices, including energy modeling, lifecycle assessment (LCA), material selection tools, and environmental impact calculators.
CO 3	CO-3 Promote Resource Efficiency: Teach students how to design for resource conservation, including minimizing waste, optimizing energy use, and selecting renewable and recyclable materials.
CO 4	CO-4 Assess Environmental Impacts: Enable students to evaluate the environmental impacts of design decisions through tools like LCA, carbon footprint analysis, and other environmental metrics.
CO 5	CO-5 Integrate Social and Ethical Considerations: Encourage students to consider social sustainability in design, including fair labor practices, inclusivity, and the well-being of communities affected by design choices.
CO 6	CO-6 Foster Innovation and Creativity in Sustainable Design: Develop students' ability to innovate sustainable solutions that address environmental, economic, and social challenges through design thinking and problem-solving techniques.
CO 7	CO-7 Enable Real-World Application: Equip students with the practical skills needed to apply sustainable design tools and methods to real-world projects, from product development to building design and urban planning.
CO 8	CO-8 Encourage Critical Thinking and Reflection: Help students critically analyze design decisions and their long-term impacts on the environment and society, fostering a mindset of continuous improvement and adaptability in sustainable design practices.

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Course: NSS

Course Outcomes	Statement
CO 1	CO-1 Develop Social Responsibility: NSS aims to build a sense of responsibility among students toward society by involving them in activities that directly impact the community's welfare.
CO 2	CO-2 Promote Volunteerism: The course encourages students to actively participate in community service projects such as literacy campaigns, environmental protection, health programs, and rural development.
CO 3	CO-3 Foster National Integration: NSS helps students understand the importance of national unity, integrity, and communal harmony by engaging them in projects across diverse communities and regions.
CO 4	CO-4 Enhance Personality Development: By participating in NSS activities, students develop qualities like leadership, teamwork, discipline, and communication, which contribute to their overall personal growth.
CO 5	CO-5 Create Awareness of Social Issues: The course aims to raise awareness about various social issues, such as poverty, health, education, and gender equality, helping students understand the challenges faced by marginalized communities.
CO 6	CO-6 Strengthen the Link between Campus and Community: NSS provides an avenue for students to connect with the broader community beyond their academic environment, helping bridge the gap between theory and real-life issues.
CO 7	CO-7 Promote Sustainable Development: Through service-oriented activities, NSS helps in promoting the values of sustainable development by involving students in eco-friendly and socially beneficial initiatives.
CO 8	CO-8 Encourage Civic Participation: NSS nurtures the habit of active participation in civic responsibilities, fostering the spirit of democracy and participation in local governance.

Course: National Service Scheme I

Course Outcomes	Statement
CO 1	CO-1 Develop Leadership Skills: NCC aims to cultivate leadership qualities and team-building skills among cadets by involving them in various activities that require decision-making, responsibility, and management.
CO 2	CO-2 Promote Physical Fitness: Physical training, including drills, marches, and physical fitness routines, is a central component of the NCC course, aiming to keep cadets healthy, fit, and active.
CO 3	CO-3 Foster Discipline and Punctuality: The NCC course instills a sense of discipline, punctuality, and respect for rules and regulations.

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	among cadets. This is achieved through regular training and adherence to strict schedules.
CO 4	CO-4 Cultivate Social Responsibility: NCC encourages cadets to become responsible citizens by promoting social service, environmental awareness, and community involvement.
CO 5	CO-5 Develop a Sense of Patriotism: Through exposure to national defense services, cadets are encouraged to develop a sense of patriotism, pride, and respect for the country.
CO 6	CO-6 Enhance Outdoor and Adventure Skills: The course includes various outdoor activities, such as trekking, camping, and adventure sports that develop survival skills, teamwork, and resilience.
CO 7	CO-7 Provide Exposure to Military and Para-military Training: The NCC offers cadets exposure to basic military training, discipline, and knowledge of armed forces activities, which can inspire interest in defense careers.
CO 8	CO-8 Promote National Integration: NCC aims to foster unity and national integration by bringing together young people from diverse backgrounds, regions, and communities.
CO 9	CO-9 Build Confidence and Self-reliance: Through various training modules and field exercises, cadets gain confidence in their abilities and develop problem-solving skills, helping them to become self-reliant individuals.

Course: Physical Education & Yoga Practices

Course Outcomes	Statement
CO 1	CO-1 Enhance Physical Fitness: To improve students' overall physical fitness, including strength, flexibility, endurance, balance, and coordination, through a variety of physical education and yoga activities.
CO 2	CO-2 Promote Health and Well-being: To encourage lifelong health habits by educating students on the importance of regular physical activity, proper nutrition, mental well-being, and stress management through yoga.
CO 3	CO-3 Develop Yoga Skills and Techniques: To teach students various yoga postures (asana), breathing techniques (pranayama), meditation practices, and relaxation techniques to enhance physical and mental well-being.
CO 4	CO-4 Foster Mind-Body Connection: To cultivate awareness of the connection between body and mind, enabling students to understand how physical activity and yoga can influence emotional and mental health.
CO 5	CO-5 Incorporate Yoga Philosophy: To introduce students to the fundamental philosophy behind yoga, including concepts like mindfulness, self-discipline, non-violence (ahimsa), and ethical conduct, which promote personal growth.

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CO 6	CO-6 Develop Personal Fitness Goals: To assist students in setting and achieving individualized fitness goals through both physical education and yoga practices, encouraging self-motivation and goal setting.
CO 7	CO-7 Promote Lifelong Activity: To instill an understanding of how regular participation in physical education and yoga can lead to a healthier lifestyle, reducing the risk of chronic diseases and improving long-term health.

Course: Water, Sanitation and Hygiene

Course Outcomes	Statement
CO 1	CO-1 Understand the Importance of WASH: Explore the impact of poor WASH on disease transmission, health, and socio-economic development.
CO 2	CO-2 Study Water Management Systems: Understand water quality standards and the treatment of water for safe consumption.
CO 3	CO-3 Examine Sanitation Systems: Understand different sanitation systems, such as sewage treatment, waste disposal, and the management of human excreta.
CO 4	CO-4 Promote Hygiene Practices: Learn about the significance of hygiene behaviors, including hand washing, safe food handling, and personal cleanliness.
CO 5	CO-5 Investigate Environmental and Social Impacts: Explore the environmental effects of inadequate sanitation and water management (e.g., pollution, contamination).
CO 6	CO-6 Understand WASH Policy and Governance: Study the roles of various stakeholders (government, NGOs, local communities) in the development and implementation of WASH projects.
CO 7	CO-7 Develop Practical Skills in WASH Implementation: Gain hands-on experience in designing, implementing, and evaluating WASH programs.
CO 8	CO-8 Promote Sustainability: Investigate methods for ensuring the long-term sustainability of WASH projects through community engagement and capacity building

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Course Outcomes (COs)

2nd Semester

Course: Fundamentals of Genetics

Course Outcomes	Statement
CO 1	CO-1 Introduction to Genetic Principles: Understand the foundational principles of inheritance, including Mendelian and non-Mendelian genetics.
CO 2	CO-2 Chromosomal Basis of Inheritance: Explore the structure and function of chromosomes and their role in heredity.
CO 3	CO-3 Molecular Genetics: Analyze the molecular structure of DNA and RNA and their roles in replication, transcription, and translation.
CO 4	CO-4 Gene Expression and Regulation: Understand how genes are regulated and expressed in prokaryotic and eukaryotic systems.
CO 5	CO-5 Mutations and Genetic Variation: Study types of mutations, their mechanisms, and their effects on organisms.
CO 6	CO-6 Population Genetics: Learn about genetic variation within populations and the principles of Hardy-Weinberg equilibrium.
CO 7	CO-7 Genetic Tools and Technologies: Explore modern genetic tools such as CRISPR, PCR, and gene sequencing techniques.

Course: Agricultural Microbiology

Course Outcomes	Statement
CO 1	CO-1 Soil Microbiology: The study of microorganisms in the soil, their role in nutrient cycling, and their impact on soil health and fertility.
CO 2	CO-2 Plant-Microbe Interactions: The relationship between microorganisms and plants, including beneficial interactions (such as nitrogen-fixing bacteria) and harmful ones (such as plant pathogens).
CO 3	CO-3 Microbial Ecology: The diversity and ecology of microbes in agricultural environments, and how they interact with each other and the plants they affect.

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CO 4	CO-4 Biological Control of Pests and Diseases: The use of microorganisms to control plant diseases and pests in an environmentally friendly way.
CO 5	CO-5 Microbial Biotechnologies in Agriculture: How biotechnology and genetic engineering are used to enhance beneficial microbial functions in agriculture (e.g., bio fertilizers, bio pesticides).
CO 6	CO-6 Waste Management in Agriculture: The role of microorganisms in decomposing organic waste and producing compost or bioenergy.
CO 7	CO-7 Food Safety and Microbes: The study of microorganisms involved in food production, processing, and preservation, including beneficial probiotics and harmful pathogens.

Course: Soil and Water Conservation Engineering

Course Outcomes	Statement
CO 1	CO-1 Understand the principles of soil and water conservation: Learn about the erosion process, types of erosion, and factors affecting soil erosion. Study the impact of erosion on agriculture, environment, and infrastructure.
CO 2	CO-2 Examine soil-water relationships: Understand soil-water retention and its effect on soil fertility and crop production. Study infiltration, percolation, and water holding capacity of soils.
CO 3	CO-3 Learn about soil erosion control techniques: Study various erosion control methods like contour plowing, terracing, and grass waterways. Understand vegetative, structural, and mechanical erosion control measures.
CO 4	CO-4 Explore water conservation strategies: Understand the techniques used to conserve water in agricultural systems, such as rainwater harvesting, water storage, and irrigation efficiency. Learn about water management practices like mulching and soil moisture management.
CO 5	CO-5 Assess land and water resources: Understand methods for evaluating soil erosion risk, water availability, and land suitability for conservation practices. Learn to design conservation measures based on site-specific conditions.

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CO 6	CO-6 Introduce water harvesting techniques: Study methods of water harvesting in dry land farming and its relevance to sustainable agriculture.
CO 7	CO-7 Foster knowledge of sustainable agricultural practices: Understand the relationship between conservation techniques and sustainable farming systems. Learn about agroforestry, cover crops, and crop rotation as part of soil and water conservation.
CO 8	CO-8 Analyze the socio-economic aspects: Understand the socio-economic importance of soil and water conservation in rural development. Study the policies and practices related to water conservation at regional and global levels.

Course: Fundamentals of Crop Physiology

Course Outcomes	Statement
CO 1	CO-1 Photosynthesis and Respiration: Understanding how plants convert light into energy, the process of respiration, and how these processes affect crop growth and yield.
CO 2	CO-2 Water Relations and Stress Physiology: Exploring how water is absorbed, transported, and utilized in crops, as well as the effects of water stress on plant health and productivity.
CO 3	CO-3 Nutrient Uptake and Metabolism: Examining how crops absorb nutrients from the soil, how these nutrients are utilized in plant growth, and the physiological effects of nutrient deficiencies.
CO 4	CO-4 Reproductive Physiology: Studying the processes of flowering, pollination, fertilization, and seed development, which are crucial for crop production.
CO 5	CO-5 Environmental Interactions: Investigating how factors like light, temperature, humidity, and soil conditions affect crop physiology and how plants adapt to different environments.
CO 6	CO-6 Growth Regulators and Hormones: Analyzing the role of plant hormones in regulating growth, development, and responses to environmental stimuli.
CO 7	CO-7 Crop Yield and Improvement: Understanding the physiological basis of crop yield, including factors that influence productivity, and

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	how crop physiology can inform breeding and management practices to improve yields.
CO 8	CO-8 Stress Physiology: Investigating how crops respond to abiotic and biotic stresses, including drought, salinity, pests, and diseases, and how these responses impact crop productivity.

Course: Fundamentals of Agricultural Economics

Course Outcomes	Statement
CO 1	CO-1 Understanding Economic Principles: Introducing basic concepts in economics, such as supply and demand, market equilibrium, and price mechanisms. Understanding the role of agriculture in the broader economy and its relationship with sectors like manufacturing, services, and trade.
CO 2	CO-2 Analyzing Agricultural Markets: Understanding how agricultural markets function, including commodity markets (e.g., grains, livestock).Exploring the factors that affect the supply and demand of agricultural products. Studying market structures like perfect competition, monopoly, and oligopoly within agriculture.
CO 3	CO-3 Evaluating Farm Production and Cost Structures: Analyzing farm production functions, and the relationship between inputs (land, labor, capital) and outputs (crops, livestock).Understanding cost structures in farming, including fixed and variable costs, total costs, and profitability.
CO 4	CO-4 Examining Agricultural Policy and Government Intervention: Studying government policies in agriculture such as subsidies, tariffs, and price supports. Understanding the impact of trade policies and international agricultural markets. Analyzing the role of public institutions like agricultural extension services and rural development programs.
CO 5	CO-5 Agricultural Risk and Uncertainty: Exploring sources of risk in agriculture (e.g., climate, pest outbreaks, and market fluctuations) and how farmers manage these risks. Understanding insurance, futures markets, and diversification strategies.
CO 6	CO-6 Farm Management and Decision-Making: Teaching techniques for optimizing resource allocation, production decisions, and financial management on farms. Understanding decision-making tools like budgeting, break-even analysis, and financial forecasting.
CO 7	CO-7 Sustainability and Agricultural: Economics exploring the economic aspects of sustainable farming practices and natural resource management. Studying the economics of environmental concerns like soil conservation, water use, and climate change.

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Course: Fundamentals of Plant Pathology

Course Outcomes	Statement
CO 1	CO-1 Understanding the Principles of Plant Pathology: Introduce the basic concepts of plant pathology, including disease causation, host-pathogen interactions, and disease development.
CO 2	CO-2 Identification of Pathogens: Study different types of plant pathogens such as fungi, bacteria, viruses, nematodes, and phytoplasmas. Learn techniques for identifying these pathogens and understanding their life cycles.
CO 3	CO-3 Mechanisms of Disease Development: Explore the process of infection, how pathogens attack plants, and the factors that influence disease progression.
CO 4	CO-4 Symptoms and Diagnosis of Plant Diseases: Learn to recognize and diagnose various symptoms of plant diseases, such as lesions, wilting, chlorosis, and necrosis.
CO 5	CO-5 Epidemiology of Plant Diseases: Study the factors that influence the spread of diseases, such as environmental conditions, crop rotation, and human activities.
CO 6	CO-6 Plant Disease Management: Examine different methods of controlling plant diseases, including chemical, biological, cultural, and genetic approaches.
CO 7	CO-7 Impact of Plant Diseases: Understand the economic and ecological impact of plant diseases on agriculture, forestry, and natural ecosystems.
CO 8	CO-8 Research and Advances in Plant Pathology: Discuss the latest developments in the field, including new technologies for pathogen detection and disease management strategies.

Course: Fundamentals of Entomology

Course Outcomes	Statement
CO 1	CO-1 Understand the Basic Concepts of Entomology: Gain knowledge of the fundamental principles of entomology, including the role of insects in ecosystems, human society, and the environment.
CO 2	CO-2 Identify and Classify Insect Species: Develop the ability to identify, classify, and distinguish between major insect orders and families, including understanding their morphological and anatomical features.
CO 3	CO-3 Study Insect Physiology: Learn about the physiological processes of insects, including digestion, respiration, excretion, reproduction, and nervous systems.

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CO 4	CO-4 Understand Insect Behavior: Investigate the behavior of insects, including communication, mating, social structures (such as in ants or bees), and response to environmental stimuli.
CO 5	CO-5 Explore Insect Ecology: Understand the ecological roles of insects, including their impact on pollination, decomposition, pest control, and as vectors of diseases.
CO 6	CO-6 Investigate Insect Evolution and Development: Examine the evolutionary history of insects and their development from egg to adult, including metamorphosis and adaptations to various environments.
CO 7	CO-7 Learn the Role of Insects in Agriculture and Medicine: Understand the economic importance of insects, both beneficial (e.g., pollinators) and harmful (e.g., agricultural pests, disease vectors), and their management in pest control and medical contexts

Course: Fundamentals of Agricultural Extension Education

Course Outcomes	Statement
CO 1	CO-1 Understand the Role of Agricultural Extension: To provide students with an understanding of the importance and role of agricultural extension in enhancing agricultural productivity, promoting sustainable practices, and improving rural livelihoods.
CO 2	CO-2 Learn Key Principles of Agricultural Extension: To introduce students to the fundamental principles, concepts, and theories that guide agricultural extension services and their application in diverse agricultural settings.
CO 3	CO-3 Examine Extension Models and Approaches: To analyze various extension models, approaches, and methodologies used to communicate agricultural knowledge and practices to farmers, communities, and stakeholders.
CO 4	CO-4 Develop Communication Skills for Extension Work: To enhance students' communication and interpersonal skills, including methods for delivering information and facilitating participatory learning within rural communities.
CO 5	CO-5 Explore Extension Program Planning and Management: To teach students how to plan, implement, monitor, and evaluate extension programs and projects that aim to address agricultural and rural development challenges.
CO 6	CO-6 Identify Key Stakeholders in Agricultural Extension: To familiarize students with the key stakeholders in agricultural extension (farmers, government agencies, NGOs, and private sector entities) and their roles in agricultural development.
CO 7	CO-7 Promote Critical Thinking in Agricultural Innovation: To encourage students to critically evaluate agricultural innovations and technologies, assessing their relevance, sustainability, and

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	effectiveness in different socio-economic and environmental contexts.

Course: Communication Skills and Personality Development

Course Outcomes	Statement
CO 1	CO-1 Enhance Verbal Communication: To develop effective spoken communication skills, enabling students to express themselves clearly, confidently, and persuasively in various contexts, including public speaking, interviews, and presentations.
CO 2	CO-2 Improve Non-Verbal Communication: To foster an understanding of non-verbal cues such as body language, facial expressions, posture, and eye contact, and how they impact communication.
CO 3	CO-3 Develop Listening Skills: To strengthen active listening abilities, emphasizing the importance of listening for understanding, feedback, and engagement in both personal and professional interactions.
CO 4	CO-4 Enhance Written Communication: To improve written communication skills, including grammar, structure, clarity, and tone, in various formats such as emails, reports, and formal correspondence.
CO 5	CO-5 Boost Confidence and Self-Presentation: To build self-awareness and self-confidence through personal grooming, positive body language, and effective self-presentation techniques in social and professional settings.
CO 6	CO-6 Foster Emotional Intelligence: To develop emotional intelligence skills such as empathy, emotional regulation, and social awareness, enhancing interpersonal relationships and communication effectiveness.
CO 7	CO-7 Cultivate Critical Thinking and Problem-Solving: To encourage critical thinking in communication, allowing students to analyze situations, solve problems effectively, and make informed decisions in both professional and personal environments.

Course: English Grammar-II

Course Outcomes	Statement
CO 1	CO-1 Enhance Advanced Understanding of Grammar: Develop a deeper understanding of complex English grammar structures, including advanced tenses, voice, mood, and conditionals.

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CO 2	CO-2 Improve Sentence Construction: Teach students to construct clear, concise, and grammatically correct sentences with an emphasis on variety and sophistication.
CO 3	CO-3 Master Complex Sentence Structures: Explore and practice complex sentence types, including compound-complex sentences, subordination, and coordination.
CO 4	CO-4 Refine Use of Modifiers and Clauses: Equip students with the skills to effectively use adjectives, adverbs, relative clauses, and other modifiers for clarity and precision in writing.
CO 5	CO-5 Analyze Punctuation and Syntax: Develop proficiency in the correct use of punctuation marks (commas, semicolons, colons, etc.) to enhance meaning and readability.
CO 6	CO-6 Strengthen Vocabulary through Grammar: Help students improve vocabulary usage through context and grammar, emphasizing word formation, collocations, and correct usage.
CO 7	CO-7 Foster Critical Grammar Application in Writing: Enable students to apply grammar rules effectively in academic, professional, and creative writing to produce error-free texts

Course: Soft Skills-II

Course Outcomes	Statement
CO 1	CO-1 Enhance Communication Skills: Improve verbal, non-verbal, and written communication abilities to ensure clarity, effectiveness, and professionalism in various settings.
CO 2	CO-2 Develop Teamwork and Collaboration: Foster the ability to work effectively in diverse teams, focusing on cooperation, conflict resolution, and mutual respect in a group environment.
CO 3	CO-3 Refine Time Management Techniques: Teach practical strategies for prioritizing tasks, meeting deadlines, and maintaining productivity in both personal and professional settings.
CO 4	CO-4 Cultivate Leadership Abilities: Develop leadership skills, including decision-making, motivating others, delegating tasks, and leading by example to inspire and guide teams.
CO 5	CO-5 Build Emotional Intelligence: Strengthen self-awareness, empathy, and emotional regulation to better understand oneself and interact with others in a professional environment.
CO 6	CO-6 Improve Problem-Solving and Critical Thinking: Equip students with strategies to approach problems systematically, think critically, and find innovative solutions in a variety of situations.
CO 7	CO-7 Promote Conflict Resolution Skills: Teach effective techniques for managing and resolving conflicts, fostering positive relationships and a harmonious work environment.

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Course: Life Management-II

Course Outcomes	Statement
CO 1	CO-1 Enhance Time Management Skills: To equip students with advanced techniques for managing their time effectively, prioritizing tasks, and balancing various aspects of life, including work, education, and personal commitments.
CO 2	CO-2 Develop Emotional Intelligence: To help students understand and manage their emotions, build empathy, and improve their interpersonal relationships both personally and professionally.
CO 3	CO-3 Master Decision-Making and Problem-Solving: To teach students methods for making informed and effective decisions, as well as strategies for solving complex life problems with confidence and clarity.
CO 4	CO-4 Financial Management and Planning: To provide students with the knowledge and skills necessary to manage personal finances, including budgeting, investing, and planning for long-term financial goals.
CO 5	CO-5 Promote Health and Wellness: To encourage students to develop habits for maintaining physical, mental, and emotional health through exercise, nutrition, mindfulness, and stress management techniques.
CO 6	CO-6 Cultivate Leadership and Social Responsibility: To foster leadership qualities, enhance teamwork skills, and inspire students to take an active role in their communities through social responsibility initiatives.
CO 7	CO-7 Set and Achieve Personal and Professional Goals: To guide students in setting realistic, measurable, and meaningful short-term and long-term goals, and to provide them with the tools and strategies to achieve them effectively.

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Course Outcomes (COs)
3rd Semester

Course: Crop Production Technology–I (Kharif Crops)

Course Outcomes	Statement
CO 1	CO-1 Understanding of Kharif Crops: To provide students with an in-depth knowledge of the different Kharif crops, their classification, and characteristics.
CO 2	CO-2 Soil and Climate Requirements: To familiarize students with the soil types, climatic conditions, and environmental factors required for successful cultivation of Kharif crops.
CO 3	CO-3 Crop Improvement: To explore strategies for improving crop yield, quality, and resistance to pests and diseases through breeding programs
CO 4	CO-4 Nutrient Management: To teach the application of appropriate fertilizers and manure for enhancing soil fertility and crop yield.
CO 5	CO-5 Management of Pests and Diseases: To introduce students to the common pests and diseases affecting Kharif crops and their management through both organic and chemical means.
CO 6	CO-6 Crop Yield and Post-Harvest Technology: To impart knowledge on harvesting techniques, post-harvest handling, and storage practices specific to Kharif crops.
CO 7	CO-7 Economics and Market Trends: To make students aware of the economics of growing Kharif crops, including cost-benefit analysis, marketing strategies, and market trends for these crops.

Course: Fundamentals of Plant Breeding

Course Outcomes	Statement
CO 1	CO-1 Understanding Genetic Principles: To provide students with a solid foundation in the principles of genetics and heredity as they relate to plant breeding.
CO 2	CO-2 Breeding Methods: To familiarize students with various plant breeding techniques, including traditional and modern methods such as hybridization, selection, and biotechnology.

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CO 3	CO-3 Crop Improvement: To explore strategies for improving crop yield, quality, and resistance to pests and diseases through breeding programs.
CO 4	CO-4 Evaluation of Breeding Lines: To teach students how to evaluate and select superior breeding lines based on phenotypic and genotypic traits.
CO 5	CO-5Plant Breeding Research: To develop skills in designing and conducting breeding experiments, including data collection and analysis.
CO 6	CO-6 Ethical Considerations: To instill an understanding of the ethical implications and societal impacts of plant breeding practices.
CO 7	CO-7 Application of Biotechnological Tools: To introduce students to biotechnological tools and techniques, such as molecular markers and genetic engineering, used in modern plant breeding.

Course: Agricultural Finance and Cooperation

Course Outcomes	Statement
CO 1	CO-1 Understanding Agricultural Finance: To introduce students to the concept and importance of agricultural finance in supporting farm operations and rural development.
CO 2	CO-2 Familiarization with Credit Systems: To understand various sources of credit available to farmers, including institutional (banks, cooperatives) and non-institutional (moneylenders, informal sources).
CO 3	CO-3 Financial Management Skills: To develop financial management skills necessary for effective resource allocation, budgeting, and planning in agricultural enterprises.
CO 4	CO-4 Cooperative Structure and Functioning: To understand the formation, operation, and management of agricultural cooperatives and their impact on rural economies.
CO 5	CO-5 Policy and Government Support: To analyze the role of government policies, subsidies, and programs in promoting agricultural finance and cooperative development.

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Course: Agri- Informatics

Course Outcomes	Statement
CO 1	CO-1 Application of Technology in Agriculture: Equip students with knowledge on the use of modern technologies like Geographic Information Systems (GIS), remote sensing, big data analytics, and precision farming techniques to enhance agricultural production and resource management.
CO 2	CO-2 Data Management & Analysis: Train students to handle large agricultural datasets, analyze them and extract actionable insights to improve farm management practices, crop yield predictions, pest control, and soil health.
CO 3	CO-3 Development of Agricultural Software Solutions: Develop the capability to design and implement software tools for various agricultural sectors, such as crop modeling, irrigation scheduling, market prediction systems, and supply chain management.
CO 4	CO-4 Sustainable Agriculture Practices: Promote understanding of sustainable farming practices by leveraging data-driven technologies to reduce waste, minimize environmental impact, and promote long-term productivity in agriculture.
CO 5	CO-5 Enhancing Decision-Making in Agriculture: Foster the ability to make informed decisions based on data, supporting farmers in improving crop management, optimizing inputs (e.g., water, fertilizers), and maximizing overall farm profitability.
CO 6	CO-6 Innovation and Research: Encourage students to engage in research and innovation in agri-informatics, exploring new ways to use technology to address global agricultural challenges such as climate change, resource scarcity, and food security.

Course: Farm Machinery and Power

Course Outcomes	Statement
CO 1	CO-1 Understanding Farm Machinery: To provide in-depth knowledge about various types of farm machinery (tractors, plows, harvesters, etc.) and their applications in modern agriculture.
CO 2	CO-2Power Systems in Agriculture: To study the power sources used in agriculture, including the operation and maintenance of engines, motors, and alternative energy systems (solar, bioenergy, etc.).
CO 3	CO-3 Technology Integration: To introduce students to cutting-edge technology such as automated systems, robotics, GPS, and precision farming tools used to optimize agricultural processes.
CO 4	CO-4 Machinery Maintenance and Management: To teach students how to manage, maintain, and repair farm machinery, ensuring optimal performance and reducing downtime in farming operations.

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CO 5	CO-5 Design and Innovation: To equip students with the knowledge to design and innovate new farming tools and machinery that can solve existing challenges in agriculture and improve efficiency.
CO 6	CO-6 Sustainable Agriculture: To promote sustainable farming practices by focusing on energy-efficient machinery, reduced environmental impact, and the incorporation of green technologies.
CO 7	CO-7 Improving Productivity: To enable students to use machinery effectively to increase farm productivity, reduce labor costs, and enhance overall agricultural output.

Course: Production Technology for Vegetables and Spices

Course Outcomes	Statement
CO 1	CO-1 Understanding the Basics of Vegetable and Spice Production: Provide foundational knowledge of the various vegetables and spices, their classification, and importance in human nutrition and economy.
CO 2	CO-2 Cultivation Practices and Techniques: Develop skills in selecting suitable varieties of vegetables and spices for different regions.
CO 3	CO-3 Soil and Climate Requirements: Equip students with the understanding of the specific soil, temperature, and climatic conditions needed for optimum growth of vegetables and spices.
CO 4	CO-4 Innovative Production Practices: Introduce advanced and innovative production techniques, such as hydroponics, vertical farming, and protected cultivation, to improve productivity and sustainability.
CO 5	CO-5 Integrated Pest Management (IPM) and Disease Control: Educate students on integrated pest management (IPM) strategies and organic practices to minimize the use of chemical pesticides and enhance food safety.
CO 6	CO-6 Post-Harvest Management: Focus on proper harvesting, handling, packaging, and storage techniques to minimize losses and preserve the quality of vegetables and spices for both local consumption and export.
CO 7	CO-7 Sustainable Agricultural Practices: Promote environmentally sustainable practices, water conservation methods, and climate-resilient strategies in vegetable and spice production.

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Course: Environmental Studies and Disaster Management

Course Outcomes	Statement
CO 1	CO-1 Understanding the Basics of Vegetable and Spice Production: Provide foundational knowledge of the various vegetables and spices, their classification, and importance in human nutrition and economy.
CO 2	CO-2Cultivation Practices and Techniques: Develop skills in selecting suitable varieties of vegetables and spices for different regions.
CO 3	CO-3 Soil and Climate Requirements: Equip students with the understanding of the specific soil, temperature, and climatic conditions needed for optimum growth of vegetables and spices
CO 4	CO-4 Innovative Production Practices: Introduce advanced and innovative production techniques, such as hydroponics, vertical farming, and protected cultivation, to improve productivity and sustainability
CO 5	CO-5 Integrated Pest Management (IPM) and Disease Control: Educate students on integrated pest management (IPM) strategies and organic practices to minimize the use of chemical pesticides and enhance food safety.
CO 6	CO-6 Post-Harvest Management: Focus on proper harvesting, handling, packaging, and storage techniques to minimize losses and preserve the quality of vegetables and spices for both local consumption and export.
CO 7	CO-7 Sustainable Agricultural Practices: Promote environmentally sustainable practices, water conservation methods, and climate-resilient strategies in vegetable and spice production

Course: Statistical Methods

Course Outcomes	Statement
CO 1	CO-1 Descriptive Statistics: This method involves summarizing and describing the main features of a dataset. It includes measures like mean, median, mode, variance, standard deviation, and range to describe the central tendency and spread of data.

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CO 2	CO-2 Inferential Statistics: This approach makes inferences or predictions about a population based on a sample of data. It involves hypothesis testing, confidence intervals, and regression analysis to draw conclusions beyond the sample data.
CO 3	CO-3 Probability Theory: The study of randomness and uncertainty. Probability distributions (such as normal, binomial, or Poisson distributions) are used to model and predict the likelihood of various outcomes.
CO 4	CO-4 Regression Analysis: A method for modeling the relationship between one dependent variable and one or more independent variables. Linear regression, logistic regression, and other types of regression are used to predict or explain the behavior of a variable.
CO 5	CO-5 Analysis of Variance (ANOVA): ANOVA is used to test for differences between two or more groups or treatments. It compares means across groups and helps determine if at least one group mean is significantly different from the others
CO 6	CO-6 Chi-Square Test: A statistical test used to determine if there is a significant association between categorical variables. It is often used in testing hypotheses about the relationship between observed and expected frequencies.
CO 7	CO-7 Time Series Analysis: This method involves analyzing data points collected or recorded at specific time intervals. It is used for forecasting and understanding trends, seasonality, and cyclic behaviors in data.

Course: Introduction to Mathematical Programming

Course Outcomes	Statement
CO 1	CO-1 Understand the Basics of Mathematical Programming: Learn the fundamental concepts of mathematical programming, including optimization problems, decision variables, constraints, and objective functions.
CO 2	CO -2 Formulate Optimization Problems: Develop the ability to translate real-world problems into mathematical programming models. This includes identifying objectives and constraints in practical situations.

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CO 3	CO-3 Learn Different Types of Optimization Problems: Explore various types of optimization problems, such as linear programming (LP), integer programming (IP), and nonlinear programming (NLP).
CO 4	CO-4 Understand and Apply Linear Programming Techniques: Gain proficiency in solving linear programming problems using methods like the Simplex algorithm, graphical methods, and duality theory.
CO 5	CO -5 Explore Integer and Mixed-Integer Programming: Learn how to solve problems involving integer constraints, and understand the challenges and techniques for solving mixed-integer programming (MIP) problems.
CO 6	CO-6 Interpret and Analyze Results: Develop the skills to analyze the results of optimization problems, including sensitivity analysis, interpreting dual variables, and evaluating the quality of the solution.
CO 7	CO-7 Introduction to Software and Tools for Mathematical Programming: Become familiar with software tools (like Excel Solver, Python, Gurobi, or CPLEX) for modeling and solving optimization problems, and understand how to apply these tools to practical problems.

Course: Introduction to Modeling and Simulation

Course Outcomes	Statement
CO 1	CO-1 Understanding the Basics of M&S: Learn the foundational concepts of modeling and simulation, including different types of models (physical, mathematical, and computational) and the role of simulation in understanding complex systems.
CO 2	CO-2 Differentiate between Types of Models: Understand the distinction between continuous and discrete models, deterministic and stochastic models, and their respective applications in real-world systems.
CO 3	CO-3 Identify Components of a Simulation: Gain insight into the key elements of a simulation, such as input data, model logic, and output analysis. Recognize the importance of each in the simulation process.
CO 4	CO-4 Application of M&S in Various Fields: Explore how modeling and simulation are used in industries such as aerospace, healthcare

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	economics, manufacturing, and environmental science for decision-making and problem solving.
CO 5	CO-5 Learn Simulation Methodologies: Study various simulation methodologies, including Monte Carlo simulations, discrete event simulation, agent-based modeling, and system dynamics, along with their appropriate applications.
CO 6	CO-6 Model Validation and Verification: Understand the processes of model verification (ensuring the model is implemented correctly) and validation (ensuring the model accurately represents the real system), and their importance in achieving reliable results.
CO 7	CO-7 Ethical and Practical Considerations: Discuss the ethical implications of using models and simulations in decision-making, along with the challenges involved in modeling real-world systems accurately, such as uncertainty and computational limits.

Course: Algebraic Techniques and Semi definite Optimization

Course Outcomes	Statement
CO 1	CO -1 Fundamentals of Algebraic Techniques: Learn the basics of linear algebra, including matrix theory, eigenvalues, and eigenvectors, which are essential tools in optimization. Understand the concept of positive semi definite (psd) matrices and their relevance in optimization problems.
CO 2	CO-2 Introduction to Optimization: Gain a foundational understanding of optimization theory, especially convex optimization. Learn about different types of optimization problems, including linear and nonlinear programming.
CO 3	CO-3 Semi definite Programming (SDP): Understand what semi definite programming is and how it generalizes linear programming to matrix variables. Explore the key properties of SDPs and how they can be formulated and solved.
CO 4	CO-4Duality Theory: Study the duality of optimization problems, focusing on how primal and dual problems are related in semi definite programming. Learn about the duality gap and its significance in solving SDPs.
CO 5	CO-5 Applications of Semi definite Optimization: Examine real-world applications of SDP in areas like control theory, machine

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	learning, structural optimization, and quantum mechanics. Explore how semi definite optimization is used in approximation algorithms and to solve problems in combinatorial optimization.
CO 6	CO-6Numerical Methods for Solving SDPs: Understand the computational methods used to solve semi definite programs, including interior-point methods and other algorithms. Learn how to implement these methods using software tools such as MATLAB, Python, or specialized optimization solvers.
CO 7	CO -7 Algebraic Structure in Optimization: Explore how algebraic structures, such as matrix factorizations and linear algebraic properties, can simplify and improve the efficiency of solving SDPs. Investigate how algebraic techniques contribute to understanding the geometry of optimization problems.

Course: Livestock and Poultry Management

Course Outcomes	Statement
CO 1	CO-1Understanding Livestock and Poultry Types: Identify and classify various types of livestock and poultry breeds, including their characteristics, uses, and the role they play in agriculture and the economy.
CO 2	CO -2 Animal Health Management: Learn the basic principles of animal health, including preventive measures, common diseases in livestock and poultry, and their treatment and control methods.
CO 3	CO-3Animal Nutrition and Feeding: Understand the nutritional needs of livestock and poultry, including the types of feed and their role in growth, reproduction, and overall health.
CO 4	CO-4 Housing and Environmental Management: Explore the importance of proper housing, space requirements, and environmental conditions for livestock and poultry to ensure their well-being and productivity.
CO 5	CO-5 Reproductive Management: Learn the principles of reproduction in livestock and poultry, including breeding techniques, estrous cycles, and the management of breeding programs.
CO 6	CO-6 Production Systems and Productivity: Investigate the different livestock and poultry production systems (e.g., free-range, intensive,

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	organic) and the factors that influence productivity, such as genetics, environment, and management practices.
CO 7	CO-7 Economic Aspects of Livestock and Poultry Farming: Examine the economic considerations in livestock and poultry management, including cost analysis, market trends, and financial planning for sustainable farm operations.

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Course Outcomes (COs)
4th Semester

Course: Crop Production Technology–II (Rabi Crops)

Course Outcomes	Statement
CO 1	CO-1 Understanding the Importance of Ornamental Crops and Landscaping: To familiarize students with the role of ornamental plants in enhancing aesthetics and improving the quality of human environments, including urban, suburban, and rural landscapes
CO 2	CO-2 Knowledge of Medicinal and Aromatic Plants (MAP): To introduce the cultivation practices, uses, and economic importance of medicinal and aromatic plants in healthcare, pharmaceuticals, and the fragrance industry
CO 3	CO-3 Cultivation Practices: To study the best practices in the propagation, cultivation, and maintenance of ornamental plants and MAPs.
CO 4	CO-4 Landscape Design and Management: To develop skills in the planning and design of landscapes using a variety of ornamental plants, including lawn management, flower beds, and shrubber.
CO 5	CO-5 Environmental Impact and Sustainability: To explore the environmental benefits of ornamental and medicinal plants, such as improving air quality, conserving biodiversity, and mitigating the effects of climate change.
CO 6	CO-6 Encourage Circular Economy in Agriculture: To promote waste-to-energy processes (e.g., using agricultural by-products for bioenergy production) to create a circular economy model in agriculture.
CO 7	CO-7 Support Rural Development: To contribute to the socio-economic development of rural areas by providing renewable energy access, creating green jobs, and improving agricultural resilience.

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Course: Renewable Energy and Green Technology

Course Outcomes	Statement
CO 1	CO -1 Understand the Principles of Renewable Energy: Develop a solid understanding of the basic principles and technologies behind renewable energy sources, such as solar, wind, geothermal, hydro, and biomass.
CO 2	CO-2 Evaluate the Environmental Impact of Energy Systems: Analyze and compare the environmental impacts of conventional and renewable energy sources, focusing on sustainability, carbon footprints, and ecological consequences.
CO 3	CO -3 Assess the Technological Advancements in Green Technology: Study the latest technological innovations in green technology, including energy-efficient appliances, smart grids, and carbon capture technologies.
CO 4	CO-4 Explore the Economics of Renewable Energy: Understand the economic challenges and opportunities in renewable energy, including cost analysis, financing, and government incentives that promote clean energy solutions.
CO 5	CO-5Analyze Policy and Regulatory Frameworks: Investigate the global and local policies, regulations, and international agreements that shape the development and deployment of renewable energy and green technologies.
CO 6	CO-6 Design and Implement Renewable Energy Projects: Learn how to design, plan, and implement renewable energy projects, including feasibility studies, site assessments, and integration with existing energy infrastructures.
CO 7	CO7 Promote Sustainable Practices and Energy Efficiency: Encourage the adoption of energy-efficient practices and sustainable energy solutions across industries and communities, emphasizing the role of green technology in mitigating climate change.

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Course: Problematic Soils and their Management

Course Outcomes	Statement
CO 1	CO-1 Identify Problematic Soils: Enable students to recognize and classify various types of problematic soils, such as saline, sodic, acidic, expansive, and compacted soils.
CO 2	CO-2 Understand Soil Genesis and Characteristics: Provide insights into the formation processes, physical, chemical, and biological properties that make soils problematic.
CO 3	CO-3 Assess Soil Degradation: Develop the ability to evaluate the extent and causes of soil degradation through laboratory and field studies.
CO 4	CO-4 Explore Soil-Plant Relationships: Examine the impact of problematic soils on plant growth and productivity, focusing on nutrient availability and water retention.
CO 5	CO-5 Management Strategies: Equip students with techniques and practices for the reclamation, amendment, and sustainable management of problematic soils.
CO 6	CO-6 Mitigate Environmental Impacts: Foster awareness of how problematic soils influence environmental systems and learn strategies to minimize adverse effects, such as erosion, pollution, or loss of biodiversity.
CO 7	CO-7 Promote Sustainable Land Use: Advocate for integrated land management approaches that balance soil restoration with agricultural productivity and ecosystem health.

Course: Production Technology for Fruit and Plantation Crops

Course Outcomes	Statement
CO 1	CO-1Understanding Crop Requirements: Develop a comprehensive understanding of the climatic, soil, and nutritional requirements of major fruit and plantation crops.
CO 2	CO-2Knowledge of Cultivation Practices: Learn scientific cultivation practices, including planting, spacing, irrigation, and fertilization methods, to enhance productivity and sustainability.
CO 3	CO-3Pest and Disease Management: Equip students with skills to identify, prevent, and manage pests and diseases affecting fruit and plantation crops using integrated pest management (IPM) techniques.

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CO 4	CO-4 Post-Harvest Technology: Understand the principles of harvesting, grading, packaging, and storage of fruit and plantation crops to maintain quality and reduce losses.
CO 5	CO-5 Improving Yield and Quality: Gain knowledge about modern technologies, including high-yielding varieties, grafting techniques, and precision farming, to improve the yield and quality of crops.
CO 6	CO-6 Sustainability and Environmental Concerns: Explore sustainable farming practices that balance production needs with environmental conservation, such as organic farming and agroforestry.
CO 7	CO-7 Market and Economic Analysis: Analyze the market trends, value chains, and economic considerations related to the production and marketing of fruit and plantation crops.

Course: Principles of Seed Technology

Course Outcomes	Statement
CO 1	CO-1 Understand the Basics of Seed Science: Develop foundational knowledge of seed biology, including seed structure, development, and physiology.
CO 2	CO-2 Learn Seed Production Techniques: Gain insights into modern methods and best practices for seed production in various crops to ensure high quality and yield.
CO 3	CO-3 Explore Seed Quality Parameters: Study the factors affecting seed quality, including genetic purity, viability, vigor, and health.
CO 4	CO-4 Master Seed Processing and Handling: Acquire practical knowledge of seed cleaning, grading, treatment, and storage methods to maintain seed quality.
CO 5	CO-5 Examine Seed Certification Standards: Understand the principles and procedures of seed certification to comply with national and international standards.
CO 6	CO-6 Study Seed Testing and Analysis: Learn techniques for seed testing, including germination tests, moisture determination, and seed health assessments.
CO 7	CO-7 Understand the Role of Seed Technology in Agriculture: Analyze the economic and ecological importance of high-quality seeds in sustainable agriculture and food security.

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Course: Farming System & Sustainable Agriculture

Course Outcomes	Statement
CO 1	CO-1 Understand Farming Systems: To provide students with a comprehensive understanding of various farming systems, including traditional, organic, and modern approaches, and their role in agricultural sustainability.
CO 2	CO-2 Analyze Agricultural Ecosystems: To explore the interactions between crops, livestock, soil, water, and climate in farming systems, emphasizing the ecological principles underlying sustainable agriculture.
CO 3	CO-3 Promote Sustainable Practices: To identify and evaluate sustainable agricultural practices that enhance productivity while conserving natural resources and maintaining ecological balance.
CO 4	CO-4 Address Environmental Challenges: To analyze the environmental challenges associated with agriculture, such as soil degradation, water scarcity, and climate change, and develop strategies for mitigation and adaptation.
CO 5	CO-5 Foster Socioeconomic Sustainability: To understand the socioeconomic dimensions of sustainable agriculture, including farmer livelihoods, market dynamics, and the role of policy in promoting sustainability.
CO 6	CO-6 Apply Technological Innovations: To explore and apply innovative technologies, such as precision farming, agro ecology, and climate-smart agriculture, to enhance sustainability and productivity in farming systems.
CO 7	CO-7 Encourage Critical Thinking and Problem-Solving: To develop critical thinking and problem-solving skills for designing and implementing sustainable agricultural solutions tailored to specific regional and global challenges.

Course: Agricultural Marketing Trade & Prices

Course Outcomes	Statement
CO 1	CO-1 Understand the Basics of Agricultural Marketing: To provide students with foundational knowledge of agricultural marketing principles, including product flow, market channels, and the role of intermediaries.
CO 2	CO-2 Analyze Agricultural Market Structures: To examine different agricultural market structures, such as perfect competition, monopolistic competition, and oligopoly, and their implications for pricing and trade.
CO 3	CO-3 Explore the Role of Agricultural Prices: To help students understand how agricultural prices are determined, including factors

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	like supply and demand, government policies, and market speculation.
CO 4	CO-4 Study International Agricultural Trade: To introduce students to the global trade of agricultural products, including trade policies, international trade agreements, and how global market trends affect local farmers and markets.
CO 5	CO-5 Evaluate the Impact of Government Policies on Agriculture: To analyze the effect of government interventions, such as subsidies, tariffs, and price supports, on agricultural markets and prices.
CO 6	CO-6 Assess the Role of Technology in Agricultural Marketing: To investigate how advancements in technology, such as digital platforms, supply chain innovations, and data analytics, are transforming agricultural marketing and pricing.
CO 7	CO-7 Develop Practical Skills for Marketing Agricultural Products: To equip students with the skills necessary for effective marketing strategies, including market research, pricing techniques, and communication strategies tailored to the agricultural sector.

Course: Introductory Agro-meteorology & Climate Change

Course Outcomes	Statement
CO 1	CO-1 Understand Basic Agro-meteorology Concepts: Introduce students to fundamental concepts in agro-meteorology, including the role of weather and climate in agriculture and how meteorological phenomena affect crop growth and farming practices.
CO 2	CO-2 Analyze Weather Systems and Agricultural Impacts: Develop skills to analyze various weather systems (such as precipitation, temperature, humidity, and wind) and understand their direct and indirect impacts on agricultural productivity and farming techniques.
CO 3	CO-3 Examine Climate Change and Its Effect on Agriculture: Explore the causes, evidence, and impacts of climate change, with a particular focus on how shifting climatic patterns affect agriculture, including crop yield variations, water availability, and pest/disease outbreaks.
CO 4	CO-4 Learn Agro-meteorological Tools and Techniques: Familiarize students with the tools, technologies, and data sources used in agro-meteorological research and applications, such as weather forecasting, climate models, and remote sensing.
CO 5	CO-5 Evaluate Climate Adaptation Strategies in Agriculture: Teach students strategies to mitigate and adapt to climate change in agriculture, including the use of climate-resilient crops, water conservation techniques, and sustainable farming practices.
CO 6	CO-6 Assess the Role of Agro-meteorology in Agricultural Decision-Making: Understand how agro-meteorological data is used by farmers, policymakers, and agricultural professionals in decision-

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	making, from planting and irrigation scheduling to pest and disease management.
CO 7	CO-7 Promote Awareness of Climate Change Mitigation: Encourage students to think critically about how to reduce the carbon footprint of agriculture and promote sustainable farming practices that contribute to global efforts in mitigating climate change.

Course: Agribusiness Management

Course Outcomes	Statement
CO 1	CO-1 Maximize Profitability: Optimize the use of resources, including land, labor, capital, and technology, to ensure the profitability and financial sustainability of agribusiness operations.
CO 2	CO-2 Efficient Resource Utilization: Ensure the efficient use of inputs like seeds, fertilizers, water, and machinery to reduce waste and increase productivity.
CO 3	CO-3 Market Competitiveness: Develop strategies to compete effectively in local and global markets, including pricing, branding, and distribution.
CO 4	CO-4 Sustainability and Environmental Stewardship: Promote environmentally sustainable practices by reducing the ecological impact of agricultural operations, conserving natural resources, and supporting biodiversity.
CO 5	CO-5 Risk Management: Identify, analyze, and mitigate risks related to price volatility, climate change, pests, diseases, and market uncertainties.
CO 6	CO-6 Enhance Supply Chain Efficiency: Streamline processes from production to distribution, ensuring timely delivery of products while maintaining quality and minimizing costs.
CO 7	CO-7 Support Rural Development: Contribute to rural economic growth by creating employment opportunities, fostering community development, and improving the livelihood of farmers and workers.

Course: Agrochemical

Course Outcomes	Statement
CO 1	CO-1 Enhance Crop Yield: Increase agricultural productivity by providing essential nutrients, protecting crops from pests and improving growth conditions.

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CO 2	CO-2 Pest and Disease Control: Protect crops from harmful pests, weeds, and diseases that can reduce yields and quality.
CO 3	CO-3 Improve Crop Quality: Ensure better-quality produce by preventing nutrient deficiencies, diseases, and pest damage.
CO 4	CO-4 Promote Efficient Resource Use: Maximize the effectiveness of water, nutrients, and soil resources through targeted applications.
CO 5	CO-5 Support Sustainable Farming Practices: Help maintain soil fertility and health while minimizing land degradation when used responsibly.
CO 6	CO-6 Facilitate Large-Scale Farming: Enable efficient management of large agricultural areas by reducing the labor required for pest control and fertilization.
CO 7	CO-7 Adapt to Changing Climate Conditions: Provide tools to combat stress factors such as drought, high temperatures, or nutrient depletion caused by climate changes.

Course: Commercial Plant Breeding

Course Outcomes	Statement
CO 1	CO-1 Improved Yield: To increase the productivity of crops per unit area, ensuring higher returns for farmers and food security for populations.
CO 2	CO-2 Disease and Pest Resistance: To develop plant varieties resistant to specific diseases and pests, reducing crop losses and the need for chemical pesticides.

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CO 3	CO-3 Abiotic Stress Tolerance: To breed plants capable of withstanding adverse environmental conditions such as drought, salinity, extreme temperatures, and flooding.
CO 4	CO-4 Enhanced Quality: To improve the nutritional value, taste, texture, shelf life, and appearance of crops, meeting consumer demands and market standards.
CO 5	CO-5 Adaptation to Mechanization: To produce crop varieties that are suited to modern agricultural practices, including mechanical planting, harvesting, and processing.
CO 6	CO-6 Shorter Growing Cycles: To develop varieties with reduced maturity periods, enabling multiple cropping in a year or better adaptation to specific growing seasons.
CO 7	CO-7 Market-Specific Traits: To tailor crops for specific industrial uses (e.g., high oil content in oilseeds, gluten content in wheat, or sugar content in sugarcane) and regional consumer preferences.

Course: Food Safety and Standards

Course Outcomes	Statement
CO 1	CO-1 Ensure Public Health: Protect consumers by ensuring that food is safe, nutritious, and free from contaminants, thereby reducing foodborne illnesses.
CO 2	CO-2 Regulate Food Quality: Establish and enforce standards for food products to ensure consistent quality and safety throughout the food supply chain.
CO 3	CO-3 Prevent Adulteration: Monitor and prevent the adulteration of food products to maintain their authenticity and protect consumer rights.

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CO 4	CO-4 Promote Hygiene in Food Handling: Encourage hygienic practices at every stage, from production and processing to storage, distribution, and consumption.
CO 5	CO-5 Facilitate Fair Trade Practices: Ensure that food businesses adhere to ethical practices, avoiding misleading claims and labeling to protect consumer interests.
CO 6	CO-6 Support Consumer Awareness: Educate consumers about food safety, labeling, and nutritional information to enable informed choices.
CO 7	CO-7 Encourage Innovation and Research: Promote advancements in food technology, safety standards, and sustainable practices to improve the overall food ecosystem.

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Course Outcomes (COs)
5th Semester

Course: Principles of Integrated Pest and Disease Management

Course Outcomes	Statement
CO 1	CO-1 Understanding Pest and Disease Dynamics: To familiarize students with the basic concepts of pest and disease biology, including their lifecycle, behavior, and factors influencing their populations.
CO 2	CO-2 Introduction to Integrated Pest Management (IPM): To introduce the concept of Integrated Pest Management (IPM) as a sustainable approach that combines multiple pest control methods.
CO 3	CO-3 Identification and Diagnosis of Pests and Diseases: To develop skills in identifying common pests, diseases, and symptoms affecting crops, and understanding their impact on yield and quality.
CO 4	CO-4 Pest and Disease Control Methods: To provide knowledge of various pest control strategies, including cultural, biological, chemical, and mechanical methods.
CO 5	CO-5 Principles of Disease Management: To study the principles and practices of plant disease control, including sanitation, crop rotation, and the use of fungicides and other disease management tools.
CO 6	CO-6 Pesticide Management and Safety: To educate students on the safe and effective use of chemical control methods, including the proper application techniques and safety protocols.
CO 7	CO-7 Sustainable Practices in Pest and Disease Management: To highlight the importance of sustainable practices in pest and disease management to ensure long-term agricultural productivity.
CO 8	CO-8 Economic and Social Aspects of Pest and Disease Management: To understand the economic importance of pest and disease management in agriculture, including cost-benefit analysis of various control measures.

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Course: Manures, Fertilizers and Soil Fertility Management

Course Outcomes	Statement
CO 1	CO-1 Understanding Soil Fertility and Nutrient Dynamics: To comprehend the concepts of soil fertility, productivity, and factors influencing them. To study the physical, chemical, and biological properties of soil that affect nutrient availability.
CO 2	CO-2 Nutrient Functions and Deficiency Symptoms: To understand the role of essential plant nutrients in crop growth and development. To identify nutrient deficiencies and toxicities and their impact on crops.
CO 3	CO-3 Manures and Organic Amendment: To learn about the types, composition, and importance of organic manures like farmyard manure, compost, green manures, and bio fertilizers. To explore methods of preparation, application, and benefits of organic amendments in sustainable agriculture.
CO 4	CO-4 Fertilizers: Types, Properties, and Application: To study various chemical fertilizers, their composition, and nutrient content. To understand fertilizer application methods, including their timing and efficiency enhancement techniques.
CO 5	CO-5 Soil Fertility Evaluation and Management: To gain proficiency in soil testing and plant analysis as tools for assessing soil fertility. To formulate site-specific nutrient management plans for sustainable crop production.
CO 6	CO-6 Environmental Implications and Best Practices: To understand the environmental impacts of excessive or improper fertilizer use. To promote integrated nutrient management (INM) for sustainable and eco-friendly agriculture.
CO 7	CO-7 Practical Applications and Field Studies: To provide hands-on experience in preparing organic manures, soil sampling, and fertilizer application. To familiarize students with fertilizer recommendations based on soil and crop requirements.

Course: Pests of Crops and Stored Grain and their Management

Course Outcomes	Statement
CO 1	CO-1 Understanding Pest Dynamics To familiarize students with the biology, ecology, and classification of major pests affecting field crops and stored grains. To understand the life cycles and damage caused by these pests to identify them effectively.

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CO 2	CO-2 Pest-Management Strategies To introduce various integrated pest management (IPM) approaches, including cultural, mechanical, biological, and chemical methods. To emphasize the safe and effective use of pesticides, focusing on resistance management and environmental sustainability.
CO 3	CO-3 Storage Pest Management To highlight the factors affecting pest infestations in storage environments and methods for preventing losses in stored grains.
CO 4	CO-4 Economic Threshold Levels and Decision-Making To develop the ability to assess economic thresholds and make informed pest management decisions based on cost-benefit analysis.
CO 5	CO-5 Sustainable Agriculture and Food Security To encourage the adoption of sustainable pest control measures that align with environmental conservation and global food security goals
CO 6	CO-6 Practical Skills Development To provide hands-on experience in pest identification, monitoring, and implementing management techniques through field visits and lab exercises.

Course: Diseases of Field and Horticultural Crops and their Management I

Course Outcomes	Statement
CO 1	CO-1 Understanding Plant Diseases: To familiarize students with the various diseases affecting field and horticultural crops, including their symptoms, etiology, and epidemiology.
CO 2	CO-2 Diagnosis and Identification: To develop the ability to identify and diagnose crop diseases based on visible symptoms, causal agents, and environmental factors.
CO 3	CO-3 Pathogen Biology: To understand the biology, life cycle, and interaction of pathogens with host plants, contributing to the development of diseases.
CO 4	CO-4 Disease Management Practices: To study and analyze various disease management strategies, including cultural, chemical, biological, and integrated pest management (IPM) approaches.

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CO 5	CO-5 Economic Impact Assessment: To assess the economic impact of diseases on crop production and explore cost-effective and sustainable management practices.
CO 6	CO-6 Latest Technologies and Research: To introduce students to modern tools and techniques such as disease forecasting models, molecular diagnostics, and biotechnological approaches in disease management.
CO 7	CO-7 Practical Applications: To provide hands-on training in field diagnosis, sample collection, pathogen isolation, and identification techniques for effective disease management.

Course: Crop Improvement-I (Kharif Crops)

Course Outcomes	Statement
CO 1	CO-1 Understanding Crop Breeding Principles: To provide fundamental knowledge of plant breeding concepts, methods, and techniques applied to kharif crops
CO 2	CO-2 Familiarity with Kharif Crop Varieties: To study the major kharif crops such as rice, maize, sorghum, pearl millet, groundnut, cotton, and pulses. To understand the characteristics of existing high-yielding, disease-resistant, and region-specific varieties.
CO 3	CO-3 Knowledge of Crop Improvement Strategies: To explore various breeding approaches like hybridization, mutation breeding, and molecular techniques for developing improved kharif crop varieties.
CO 4	CO-4 Genetic Resource Management: To familiarize students with the conservation, evaluation, and utilization of plant genetic resources for crop improvement.
CO 5	CO-5 Problem-Solving Skills: To identify the challenges related to kharif crop production, such as pests, diseases, and abiotic stresses, and develop strategies for improvement.
CO 6	CO-6 Practical Exposure: To provide hands-on training in breeding techniques, hybridization, and evaluation of breeding material for kharif crop.

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Course: Entrepreneurship Development and Business

Course Outcomes	Statement
CO 1	CO-1 Understanding the Basics of Entrepreneurship: To introduce students to the fundamental concepts of entrepreneurship, including the role of entrepreneurs in economic development. To explore entrepreneurial traits, skills, and competencies relevant to the agricultural sector.
CO 2	CO-2 Promoting an Entrepreneurial Mindset: To instill a proactive approach to identifying opportunities and solving challenges within the agri-business and allied sectors. To encourage creativity, innovation, and risk-taking among students.
CO 3	CO-3 Development of Managerial and Business Skills: To equip students with essential knowledge of business planning, financial management, and marketing strategies specific to agriculture. To familiarize students with legal, regulatory, and procedural aspects of starting and running a business.
CO 4	CO-4 Exposure to Agripreneurship: To develop an understanding of agribusiness models, value chain development, and opportunities in modern agriculture, including organic farming, precision farming, and agro-processing. To explore rural entrepreneurship and cooperatives as pathways for sustainable development.
CO 5	CO-5 Practical Application and Skill Development: To provide hands-on experience in creating business plans and feasibility reports tailored for agricultural ventures. To enhance leadership, decision-making, and problem-solving skills through case studies, field visits, and projects.
CO 6	CO-6 Leveraging Technology and Innovation: To emphasize the role of digital technologies, e-commerce, and ICT tools in modern agricultural business development. To understand how technological advancements can drive profitability and efficiency in agriculture-related enterprises.

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Course: Communication & English Grammar-III

Course Outcomes	Statement
CO 1	CO-1 Develop Advanced Communication Skills Enhance students' ability to communicate effectively in academic, professional, and social settings, with a focus on oral and written English.
CO 2	CO-2 Strengthen Grammatical Proficiency Provide in-depth knowledge of advanced English grammar, including complex sentence structures, clauses, voice, and reported speech.
CO 3	CO-3 Promote Critical Thinking and Expression Foster critical thinking and the ability to express ideas clearly and concisely in English.
CO 4	CO-4 Enhance Professional Writing Skills Equip students with skills for writing formal letters, emails, reports, and proposals relevant to agricultural and allied sectors.
CO 5	CO-5 Improve Presentation and Public Speaking Skills Train students in delivering effective presentations and participating in group discussions and debates.
CO 6	CO-6 Cultural and Contextual Understanding Enable students to use language effectively in diverse cultural and professional contexts, especially in the agricultural field.
CO 7	CO-7 Ethics and Professionalism: Instill a sense of ethics, integrity, and professionalism in communication and decision-making.

Course: Life Management-III

Course Outcomes	Statement
CO 1	CO-1 Holistic Development: To enable students to develop a balanced approach toward personal and professional life, fostering physical, mental, emotional, and spiritual well-being.
CO 2	CO-2 Stress Management: To introduce students to practical techniques and strategies for managing stress and maintaining a positive outlook amidst challenges in academic and agricultural careers.
CO 3	CO-3 Interpersonal Skills: To improve communication, teamwork, and leadership skills, ensuring effective collaboration in diverse environments.

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CO 4	CO-4 Time Management: To equip students with methods to prioritize tasks, manage time effectively, and increase productivity in their studies and work.
CO 5	CO-5 Ethics and Values: To instill a strong foundation of ethical principles and values that guide responsible behavior in both personal and professional spheres.
CO 6	CO-6 Decision-Making Skills: To develop analytical and critical thinking abilities to make informed and impactful decisions in various life situations.
CO 7	CO-7 Resilience Building: To foster resilience and adaptability, enabling students to overcome challenges and excel in a dynamic agricultural industry.
CO 8	CO-8 Goal Setting and Motivation: To assist students in setting realistic goals, maintaining focus, and staying motivated to achieve success in their academic and personal endeavors.

Course: Geo-informatics, Nano-technology and Precision Farming

Course Outcomes	Statement
CO 1	CO-1 Introduction to Geo-Informatics: To develop an understanding of the principles and applications of Geographic Information Systems (GIS) and Remote Sensing in agriculture. To enable students to analyze spatial data and apply mapping techniques for agricultural planning and resource management.
CO 2	CO-2 Fundamentals of Nano-Technology in Agriculture: To introduce the concepts of nanotechnology and its potential applications in improving agricultural productivity and sustainability. To familiarize students with Nano-based tools, devices, and materials for soil and water management, pest control, and crop improvement.
CO 3	CO-3 Precision Farming Concepts: To provide insights into the principles and practices of precision farming for efficient resource utilization. To train students in the use of modern tools such as sensors, drones, and automated systems for real-time monitoring and decision-making in agriculture.
CO 4	CO-4 Integration of Technologies: To explore the combined use of geo-informatics, nanotechnology, and precision farming to address challenges in modern agriculture. To enhance skills in data-driven decision-making and sustainable agricultural practices.

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CO 5	CO-5 Sustainability and Innovation: To promote the adoption of innovative and sustainable technologies to improve agricultural productivity while minimizing environmental impacts. To encourage critical thinking and research-oriented approaches in leveraging emerging technologies for rural and agricultural development.
CO 6	CO-6 Hands-on Experience: To provide practical exposure to GIS software, remote sensing tools, Nano-materials, and precision agriculture equipment.

Course: Practical Crop Production – I (Kharif crops)

Course Outcomes	Statement
CO 1	CO-1 Understanding the Kharif Cropping System To provide students with in-depth knowledge of the climatic, soil, and water requirements of major Kharif crops. To familiarize students with the cropping patterns and production constraints of Kharif season crops.
CO 2	CO-2 Practical Crop Management To develop skills in the preparation of field operations, including land preparation, sowing, irrigation, and weed management. To impart knowledge about integrated nutrient, pest, and disease management practices for Kharif crops.
CO 3	CO-3 Seed and Input Management To train students in the selection, storage, and treatment of quality seeds. To enhance understanding of fertilizer application methods, organic manures, and bio-fertilizers for sustainable crop production.
CO 4	CO-4 Crop Monitoring and Evaluation To enable students to monitor crop growth, identify stress conditions, and take corrective measures. To train students in yield estimation, harvesting techniques, and post-harvest handling.
CO 5	CO-5 Economic and Sustainable Practices To teach cost-effective and sustainable agricultural practices for optimizing the productivity of Kharif crops. To create awareness of climate-smart agriculture and water-efficient practices.
CO 6	CO-6 Hands-On Experience To provide hands-on experience in the cultivation of major Kharif crops like paddy, maize, sorghum, pearl millet, groundnut, soybean, cotton, etc. To involve students in

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	fieldwork, covering all aspects of crop production from sowing to harvesting.
CO 7	CO-7 Practical Record Maintenance To ensure students can maintain detailed field records, analyze data, and prepare reports on crop performance.

Course: Intellectual Property Rights

Course Outcomes	Statement
CO 1	CO-1 To Understand the Fundamentals of IPR To introduce students to the basic concepts, types, and significance of Intellectual Property Rights (IPR) in agriculture and related fields.
CO 2	CO-2 To Explore Legal and Policy Frameworks To familiarize students with national and international legal frameworks governing intellectual property, such as patents, trademarks, copyrights, and plant breeders' rights, with specific relevance to agriculture.
CO 3	CO-3 To Encourage Innovation and Entrepreneurship To promote awareness of the role of IPR in fostering innovation, research, and development, encouraging students to explore entrepreneurial opportunities in agriculture
CO 4	CO-4 To Address Ethical and Social Issues To develop an understanding of the ethical, social, and environmental implications of IPR in agriculture, including issues of bio piracy, traditional knowledge, and biodiversity conservation
CO 5	CO-5 To Equip Students with Practical Knowledge To provide students with knowledge of procedures for patent filing, geographical indications, copyrights, and plant variety protection, equipping them with skills to apply IPR concepts in agricultural practice.
CO 6	CO-6 To Prepare for Future Challenges To prepare students to address future challenges related to technology transfer, Commercialization, and the global competitiveness of agricultural products.

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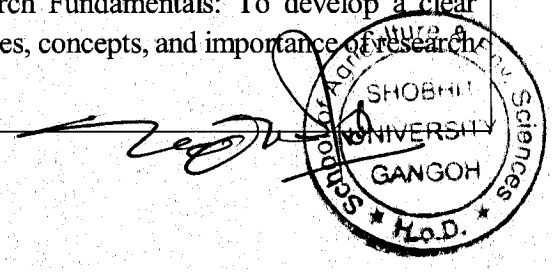
Course: Research Methodology

Course Outcomes	Statement
CO 1	CO-1 Understanding Research Fundamentals: To develop a clear understanding of the principles, concepts, and importance of research in agriculture. To familiarize students with the types, objectives, and methodologies of agricultural research
CO 2	CO-2 Problem Identification and Formulation: To enable students to identify, define, and articulate research problems specific to agricultural sciences. To guide students in framing research hypotheses and objectives
CO 3	CO-3 Research Design and Methodology: To introduce students to various research designs, sampling techniques, and data collection methods suited to agricultural studies. To train students in the preparation and execution of research plans.
CO 4	CO-4 Data Analysis and Interpretation: To teach students basic statistical tools and techniques for data analysis in agricultural research. To guide students in interpreting research results and deriving meaningful conclusions.
CO 5	CO-5 Scientific Writing and Reporting: To develop skills for writing research proposals, reports, and scientific papers in the field of agriculture. To train students in effective communication and presentation of research findings.
CO 6	CO-6 Application of Research Tools: To familiarize students with modern tools and software used in agricultural research. To emphasize ethical practices in conducting research and handling data.
CO 7	CO-7 Problem-Solving and Decision-Making: To cultivate critical thinking and analytical skills necessary for addressing real-world agricultural challenges through research.

Course: Publication Ethics and Emerging trends in Research

Course Outcomes	Statement
CO 1	CO-1 Understanding Research Fundamentals: To develop a clear understanding of the principles, concepts, and importance of research



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	in agriculture. To familiarize students with the types, objectives, and methodologies of agricultural research.
CO 2	CO-2 Problem Identification and Formulation: To enable students to identify, define, and articulate research problems specific to agricultural sciences. To guide students in framing research hypotheses and objectives.
CO 3	CO-3 Research Design and Methodology: To introduce students to various research designs, sampling techniques, and data collection methods suited to agricultural studies. To train students in the preparation and execution of research plans.
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CO 6	CO-6 Application of Research Tools: To familiarize students with modern tools and software used in agricultural research. To emphasize ethical practices in conducting research and handling data.
CO 7	CO-7 Problem-Solving and Decision-Making: To cultivate critical thinking and analytical skills necessary for addressing real-world agricultural challenges through research.

Course: Landscaping

Course Outcomes	Statement
CO 1	CO-1 Aesthetic Enhancement: Create visually appealing spaces through the use of plants, structures, and other landscape elements.
CO 2	CO-2 Functional Use: Optimize outdoor spaces for practical purposes, such as recreation, dining, walking paths, or seating areas.

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CO 3	CO-3 Environmental Sustainability: Promote ecological balance by incorporating native plants, conserving water, and providing habitats for wildlife.
CO 4	CO-4 Climate Moderation: Use landscaping elements like trees and shrubs to regulate temperature, reduce heat, and provide shade or windbreaks.
CO 5	CO-5 Erosion and Soil Protection: Prevent soil erosion and degradation by using ground covers, terraces, and retaining walls.
CO 6	CO-6 Increase Property Value: Enhance the market value of a property through thoughtful and well-maintained landscaping.
CO 7	CO-7 Improved Air and Noise Quality: Use plants to purify the air and act as natural sound barriers to reduce noise pollution.

Course: Biopesticides & Biofertilizers

Course Outcomes	Statement
CO 1	CO-1 Enhance Crop Productivity: Improve soil fertility and plant health to increase crop yields.
CO 2	CO-2 Promote Sustainable Agriculture: Reduce reliance on chemical pesticides and fertilizers, fostering eco-friendly farming practices.
CO 3	CO-3 Improve Soil Health: Restore and maintain soil microbial diversity and organic matter content.
CO 4	CO-4 Reduce Environmental Impact: Minimize soil, water, and air pollution by avoiding harmful chemical inputs.
CO 5	CO-5 Support Integrated Pest and Nutrient Management: Provide targeted pest control and nutrient supplementation without disrupting natural ecosystems.
CO 6	CO-6 Enhance Crop Quality: Improve the nutritional value, flavor, and shelf life of agricultural produce.
CO 7	CO-7 Promote Farmer and Consumer Safety: Reduce health risks associated with synthetic agrochemicals for farmers and consumers.

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Course: Protected Cultivation

Course Outcomes	Statement
CO 1	CO-1 Enhanced Crop Productivity: To increase the yield per unit area by optimizing environmental conditions like temperature, humidity, and light for plant growth.
CO 2	CO-2 Quality Improvement: To produce high-quality crops with uniformity in size, shape, and color by minimizing environmental stress and pest damage.
CO 3	CO-3 Extended Growing Seasons: To enable off-season production or extend the growing season of specific crops, ensuring a continuous supply to the market.
CO 4	CO-4 Resource Efficiency: To conserve resources such as water and nutrients through efficient irrigation systems like drip irrigation and fertigation.
CO 5	CO-5 Pest and Disease Management: To reduce crop loss by providing a physical barrier against pests and diseases, minimizing the need for chemical pesticides.
CO 6	CO-6 Climate Resilience: To mitigate the adverse effects of extreme weather events such as frost, hail, excessive rain, or drought, ensuring stable crop production.
CO 7	CO-7 Diversification and Innovation: To enable the cultivation of high-value crops, exotic vegetables, flowers, and fruits that might not thrive in open-field conditions due to climatic limitations.

Course: Micro propagation Technologies

Course Outcomes	Statement
CO 1	CO-1 Mass Production of Plants: To produce a large number of genetically identical plants in a relatively short time, ensuring consistent traits and uniform quality.
CO 2	CO-2 Preservation of Genetic Traits: To maintain and propagate plants with specific desirable characteristics, such as disease resistance, high yield, or ornamental value.
CO 3	CO-3 Propagation of Rare or Endangered Species: To conserve and multiply species that are rare, endangered, or difficult to propagate through conventional methods.

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CO 4	CO-4 Production of Disease-Free Plants: To obtain pathogen-free plants by using meristem or shoot-tip cultures, particularly in cases where diseases are transmitted through seeds or vegetative propagation.
CO 5	CO-5 Year-Round Production: To enable plant propagation irrespective of seasonal or environmental limitations, ensuring a continuous supply of plants.
CO 6	CO-6 Development of Genetically Engineered Plants: To propagate transgenic plants or plants developed through genetic engineering techniques that may have enhanced traits such as pest resistance or stress tolerance.
CO 7	CO-7 Facilitation of International Trade: To produce plants in sterile, contamination-free conditions that comply with quarantine regulations, allowing for the export and import of plants without spreading diseases or pests.

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Course Outcomes (COs)
6th Semester

Course: Rainfed Agriculture & Watershed Management

Course Outcomes	Statement
CO 1	CO-01 Understanding Rainfed Agriculture Systems: To comprehend the characteristics, challenges, and potential of agricultural systems in rainfed areas and their role in sustainable food production.
CO 2	CO-02 Enhancing Water Use Efficiency: To study techniques for optimizing water use in rainfed agriculture through soil moisture conservation, efficient irrigation methods, and crop selection.
CO 3	CO-03 Soil and Water Conservation: To develop knowledge of soil erosion control, water harvesting techniques, and strategies for enhancing soil fertility in rainfed regions.
CO 4	CO- 04 Climate Resilience in Rainfed Areas: To learn about the impacts of climate change on rainfed agriculture and strategies to build resilience through adaptive cropping systems and agroforestry.
CO 5	CO- 05 Integrated Watershed Development: To study the integration of agricultural productivity, water resource development, and ecological balance in watershed management projects.
CO 6	CO- 06 Policy and Socioeconomic Aspects: To analyze policies, community participation, and economic strategies for the sustainable development of rainfed and watershed-based agriculture.

Course: Protected Cultivation and Secondary Agriculture

Course Outcomes	Statement
CO 1	CO- 1 Understand the Principles of Protected Cultivation: Equip students with knowledge about the fundamentals of protected cultivation, including greenhouse design, climate control systems, and production technologies.
CO 2	CO- 2 Learn Modern Cultivation Practices: Introduce advanced cultivation techniques like hydroponics, aeroponics, and vertical farming to optimize crop yields and resource efficiency.

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CO 3	CO- 3 Develop Skills in Environmental Control: Teach methods for managing temperature, humidity, light, and ventilation in controlled environments to enhance crop quality and productivity.
CO 4	CO- 4 Promote Resource Efficiency: Emphasize sustainable practices, including water-use efficiency, integrated pest management, and energy conservation in protected farming systems.
CO 5	CO- 5 Understand the Role of Secondary Agriculture: Highlight the importance of post-harvest processing, value addition, and storage techniques in reducing agricultural losses and increasing farmer income.

Course: Diseases of Field and Horticultural Crops and their Management-II

Course Outcomes	Statement
CO 1	CO- 1 Understand Major Crop Diseases: To provide an in-depth understanding of the major diseases affecting field and horticultural crops, including their etiology, symptoms, and epidemiology.
CO 2	CO- 2 Identify Disease Symptoms: To equip students with the skills to accurately identify diseases in crops through field observations and laboratory diagnostics.
CO 3	CO- 3 Analyze Disease Dynamics: To study the factors influencing disease development and spread, including climatic, biological, and cultural conditions.
CO 4	CO- 4 Apply Management Strategies: To introduce integrated disease management strategies, including cultural, biological, chemical, and genetic approaches.
CO 5	CO- 5 Evaluate Disease Resistance: To understand the role of plant resistance and breeding for disease-resistant crop varieties.
CO 6	CO- 6 Implement Disease Monitoring Tools: To teach techniques for monitoring disease outbreaks and predicting potential epidemics using modern tools and technologies.
CO 7	CO- 7 Promote Sustainable Practices: To emphasize the importance of eco-friendly and sustainable disease management practices to minimize environmental impact and ensure long-term crop health.

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Course: Post-harvest Management and Value Addition of Fruits and Vegetables

Course Outcomes	Statement
CO 1	CO-1 Understand Post-Harvest Physiology: To explain the physiological and biochemical changes occurring in fruits and vegetables after harvest, including ripening, senescence, and spoilage.
CO 2	CO-2 Minimize Post-Harvest Losses: To identify factors contributing to post-harvest losses and develop strategies to minimize these losses during handling, storage, and transportation.
CO 3	CO- 3 Learn Preservation Techniques: To study various preservation methods, such as refrigeration, canning, drying, and freezing, to extend the shelf life of fruits and vegetables.
CO 4	CO- 4 Enhance Value Addition Skills: To explore processes for transforming fresh produce into value-added products such as juices, jams, pickles, and dried snacks.
CO 5	CO- 5 Understand Quality Standards: To examine quality assessment techniques and standards for fruits and vegetables to ensure food safety and market acceptability.
CO 6	CO-6 Develop Packaging and Storage Solutions: To design appropriate packaging and storage systems that maintain the quality and nutritional value of fruits and vegetables.

Course: Management of Beneficial Insects

Course Outcomes	Statement
CO 1	CO-1 Identify Beneficial Insects: Develop the ability to recognize and classify key beneficial insect species, including pollinators, predators, and parasitoids, based on their roles in ecosystems and agriculture.
CO 2	CO-2 Understand Ecological Roles: Gain comprehensive knowledge about the ecological functions of beneficial insects, including their contributions to pollination, pest control, and biodiversity.

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CO 3	CO-3 Explore Habitat Requirements: Learn to assess the habitat needs of beneficial insects and understand how to create or manage environments that support their survival and effectiveness.
CO 4	CO-4 Implement Conservation Strategies: Develop strategies for conserving and enhancing populations of beneficial insects through sustainable practices such as integrated pest management (IPM) and agro ecological approaches.
CO 5	CO-5 Evaluate Environmental Impact: Analyze the effects of agricultural practices, pesticide use, and climate change on beneficial insect populations and their ecological functions.
CO 6	CO-6 Promote Sustainable Agriculture: Understand the integration of beneficial insects into sustainable agricultural systems to improve crop yields, reduce chemical inputs, and foster environmental health.
CO 7	CO-7 Develop Management Plans: Design and implement practical management plans for promoting beneficial insects in agricultural and natural ecosystems, tailored to specific regions or crop systems.

Course: Crop Improvement-II (Rabi crops)

Course Outcomes	Statement
CO 1	CO-1 Understanding the Importance of Rabi Crops: Explain the economic and nutritional significance of major Rabi crops in agriculture and their role in ensuring food security.
CO 2	CO-2 Exploring Crop Breeding Techniques: Study advanced breeding methods, including hybridization, mutation breeding, and biotechnological approaches, for the genetic improvement of Rabi crops.
CO 3	CO-3 Enhancing Stress Tolerance: Develop strategies to improve Rabi crops' tolerance to abiotic stresses like drought, frost, and nutrient deficiencies, as well as biotic stresses such as pests and diseases.
CO 4	CO-4 Focusing on Yield and Quality Traits: Improve the productivity, nutritional quality, and marketability of Rabi crops through targeted breeding and selection techniques.

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CO 5	CO-5 Integrating Genomics and Biotechnology: Apply molecular biology tools, such as marker-assisted selection (MAS) and genetic engineering, for faster and more precise crop improvement

Course: Practical Crop Production –II (Rabi crops)

Course Outcomes	Statement
CO 1	CO-1 Understand Rabi Crop Management: Develop a comprehensive understanding of the principles and practices involved in the cultivation of major Rabi crops, including wheat, barley, mustard, chickpea, and lentils.
CO 2	CO-2 Learn Soil Preparation Techniques: Gain practical knowledge of soil preparation, nutrient management, and seedbed preparation techniques suitable for Rabi crop cultivation.
CO 3	CO-3 Master Sowing Practices: Acquire skills in selecting, treating, and sowing seeds at appropriate times and methods to ensure optimal germination and yield.
CO 4	CO-4 Implement Irrigation Strategies: Learn the principles of water management and irrigation scheduling specific to the requirements of Rabi crops.
CO 5	CO-5 Apply Pest and Weed Management: Develop proficiency in identifying and managing pests, diseases, and weeds that affect Rabi crops using integrated pest management (IPM) strategies.
CO 6	CO-6 Practice Harvesting and Post-Harvest Techniques: Understand the methods of harvesting, threshing, storage, and quality preservation of Rabi crops to minimize losses and maintain market standards.

Course: Principles of Organic Farming

Course Outcomes	Statement
CO 1	CO-1 Understand the Fundamentals of Organic Farming: Learn the basic principles, philosophy, and historical development of organic agriculture.

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CO 2	CO-2 Recognize the Importance of Soil Health: Study the role of soil fertility and health in organic farming, including practices like composting, crop rotation, and cover cropping.
CO 3	CO-3 Explore Organic Farming Practices: Examine the techniques used in organic farming, such as natural pest management, weed control, and water conservation methods.
CO 4	CO-4 Analyze Certification Standards: Understand the rules, regulations, and certification processes for organic farming at national and international levels.
CO 5	CO-5 Promote Environmental Sustainability: Assess how organic farming contributes to environmental sustainability by reducing chemical inputs and promoting biodiversity.

Course: Farm Management, Production & Resource Economics

Course Outcomes	Statement
CO 1	CO-1 Understand the Principles of Farm Management: Equip students with knowledge of the core principles of managing a farm, including planning, organizing, directing, and controlling agricultural operations.
CO 2	CO-2 Analyze Agricultural Production Systems: Develop the ability to assess and optimize production systems to improve efficiency and productivity in farm enterprises.
CO 3	CO-3 Apply Economic Principles to Resource Allocation: Train students to apply economic concepts to allocate resources effectively, ensuring sustainability and profitability in agriculture.
CO 4	CO-4 Evaluate Financial Performance of Farms: Enable students to use financial tools and techniques to evaluate the profitability, liquidity, and solvency of farm businesses.
CO 5	CO-5 Understand Risk and Uncertainty in Agriculture: Teach strategies to manage risks and uncertainties in farming caused by market fluctuations, climate variability, and policy changes.
CO 6	CO-6 Optimize Resource Use for Sustainable Farming: Instill knowledge about sustainable use of land, labor, capital, and technology to achieve long-term agricultural viability.

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Course: Principles of Food Science and Nutrition

Course Outcomes	Statement
CO 1	CO-1 Understand the Fundamentals of Food Science: Explain the physical, chemical, and biological principles underlying food systems and their application in food production and processing.
CO 2	CO-2 Explore Nutritional Requirements: Analyze the role of essential nutrients in human health and their impact on growth, development, and disease prevention.
CO 3	CO-3 Evaluate Food Quality and Safety: Assess factors that affect food quality, safety, and shelf life, including food preservation techniques and contamination risks.
CO 4	CO-4 Investigate Food Processing Methods: Identify and describe common food processing methods and their influence on nutritional value, sensory properties, and food functionality.
CO 5	CO-5 Examine the Role of Food in Society: Discuss the cultural, social, and economic factors that influence food choices and dietary habits globally.
CO 6	CO-6 Apply Principles of Nutrition: Design balanced diets and recommend nutritional interventions based on scientific evidence to address specific health conditions or goals.

Course: Agricultural Journalism

Course Outcomes	Statement
CO 1	CO-1 Understand Agricultural Issues and Trends: To familiarize students with the key issues, challenges, and trends in agriculture, including sustainability, food security, climate change, and technological advancements.
CO 2	CO-2 Develop Writing and Reporting Skills: To teach students how to effectively research, write, and report on agricultural topics

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	ensuring clarity and accuracy while making complex subjects accessible to diverse audiences.
CO 3	CO-3 Foster Multimedia Communication Abilities: To enable students to use various media formats—such as print, radio, television, and digital platforms—to communicate agricultural stories, including the use of social media for outreach.
CO 4	CO-4 Critically Analyze Agricultural Policies and Practices: To provide students with the skills to critically assess agricultural policies, practices, and their impacts on rural communities, economies, and the environment.
CO 5	CO-5 Enhance Ethical and Responsible Journalism: To instill a strong understanding of journalistic ethics, particularly in the context of reporting on agricultural issues, with a focus on balanced, fair, and transparent reporting.
CO 6	CO-6 Cultivate Collaboration with Agricultural Stakeholders: To prepare students to work closely with farmers, agricultural businesses, government agencies, NGOs, and other stakeholders in the agricultural sector to gather information and enhance their stories.
CO 7	CO-7 Promote Advocacy and Public Awareness: To empower students to use journalism as a tool for advocacy, raising awareness about critical agricultural issues and contributing to informed public discourse on topics such as food production, rural development, and environmental sustainability.

Course: Hi-tech. Horticulture

Course Outcomes	Statement
CO 1	CO-1 Enhancing Productivity: To maximize the yield of high-value crops by using advanced cultivation techniques, optimized resource management, and superior plant genetics.
CO 2	CO-2 Efficient Resource Utilization: To promote the efficient use of inputs such as water, nutrients, and energy through technologies like drip irrigation, fertigation, and protected cultivation.
CO 3	CO-3 Improved Quality of Produce: To achieve higher quality standards in terms of size, color, taste, and shelf life by leveraging precision agriculture and controlled environment farming.

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CO 4	CO-4 Sustainability: To reduce the environmental footprint of horticultural practices by promoting eco-friendly techniques such as organic farming, integrated pest management (IPM), and renewable energy sources.
CO 5	CO-5 Diversification of Crops: To introduce and promote the cultivation of high-value exotic and off-season crops, expanding the market and income opportunities for farmers.
CO 6	CO-6 Reduction in Post-Harvest Losses: To minimize post-harvest losses by adopting modern storage, packaging, and transportation methods.
CO 7	CO-7 Technology Dissemination and Farmer Empowerment: To transfer advanced technologies to farmers, enhancing their skills and enabling them to adopt profitable and sustainable horticultural practices.

Course: Weed Management

Course Outcomes	Statement
CO 1	CO-1 Understanding Weed Biology and Ecology: Explain the life cycles, reproduction strategies, and ecological roles of weeds in agricultural and non-agricultural ecosystems.
CO 2	CO-2 Identification and Classification of Weeds: Equip students with the skills to identify common weed species and classify them based on their morphology, lifecycle, and habitat.
CO 3	CO-3 Principles of Weed-Crop Competition: Analyze the impact of weeds on crop growth and yield through competition for resources like light, water, and nutrients.
CO 4	CO-4 Weed Control Methods: Compare and evaluate various weed management strategies, including cultural, mechanical, biological, and chemical control methods.
CO 5	CO-5 Integrated Weed Management (IWM): Design and implement integrated weed management plans that combine multiple control strategies to ensure long-term weed suppression and sustainable agriculture.
CO 6	CO-6 Herbicide Use and Resistance Management: Examine the proper use of herbicides, their mode of action, environmental impact, and strategies to prevent or manage herbicide resistance.
CO 7	CO-7 Economic and Environmental Impacts of Weed Management: Assess the cost-benefit analysis of weed control measures and their

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	implications for environmental sustainability and agricultural productivity.

Course: System Simulation and Agro-advisory

Course Outcomes	Statement
CO 1	CO-1 Understand System Simulation Basics: To introduce the fundamentals of system simulation, including types of models (e.g., discrete-event, continuous, hybrid), simulation techniques, and their applications in agricultural systems.
CO 2	CO-2 Develop Simulation Models for Agricultural Systems: To develop and implement simulation models to represent agricultural processes such as crop growth, irrigation, pest management, and climate change impacts.
CO 3	CO-3 Analyze and Interpret Simulation Data: To train students on analyzing simulation results, understanding model outputs, and interpreting data in the context of agricultural decision-making.
CO 4	CO-4 Explore the Role of Agro-Advisory Systems: To provide a deep understanding of agro-advisory systems, their importance, and how they provide actionable insights to farmers for crop management, pest control, irrigation, and fertilization.
CO 5	CO-5 Apply Simulation Techniques to Agro-Advisory Tools: To explore how simulation models can be integrated with agro-advisory systems to provide personalized, data-driven recommendations for farmers.
CO 6	CO-6 Assess the Impact of Climate and Environmental Variables: To understand how environmental variables like weather, climate change, and soil conditions affect agricultural systems, and how to simulate their impacts for better planning and advisories.
CO 7	CO-7 Evaluate and Design Decision Support Systems for Agriculture: To help students evaluate existing decision support systems and design new ones that leverage simulation models to optimize agricultural practices and improve farm productivity and sustainability.

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Course Outcomes (COs)
7th Semester

Course: General orientation & on campus training by different Faculties

Course Outcomes	Statement
CO 1	CO-1 Familiarization with the Institution: Introduce students to the institution's culture, values, and infrastructure. Provide an overview of various academic and co-curricular resources available on campus.
CO 2	CO-2 Interdisciplinary Exposure: Facilitate interaction with faculty members from different disciplines to broaden students' academic perspectives. Encourage understanding of multidisciplinary approaches to problem-solving and learning.
CO 3	CO-3 Skill Development: Enhance communication, teamwork, and interpersonal skills through interactive sessions. Introduce students to tools and techniques relevant to academic and professional success.
CO 4	CO-4 Guidance on Academic Pathways: Offer insights into academic programs, research opportunities, and career trajectories. Provide orientation on the curriculum, evaluation systems, and academic expectations.
CO 5	CO-5 Motivation and Goal Setting: Inspire students through lectures and interactions with experienced faculty. Help students set personal and academic goals for their educational journey.
CO 6	CO-6 Community Building: Create a sense of belonging and engagement among students by fostering peer and faculty interactions. Encourage participation in campus life, clubs, and other student activities.

Course: Village attachment

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Course Outcomes	Statement
CO 1	CO-1 Understanding Rural Life: To familiarize students with the day-to-day lifestyle, culture, traditions, and challenges faced by rural communities.
CO 2	CO-2 Knowledge of Agricultural Practices: To observe and analyze the farming systems, cropping patterns, and the use of modern and traditional agricultural techniques.
CO 3	CO-3 Socio-Economic Awareness: To assess the socio-economic structure of rural areas, including income sources, living standards, education, healthcare, and social organization.
CO 4	CO-4 Community Engagement: To encourage students to interact with farmers, laborers, and village authorities to understand their perspectives and aspirations.
CO 5	CO-5 Identification of Problems: To identify key issues in rural development, such as water scarcity, soil degradation, lack of education, or health facilities, and suggest possible solutions.
CO 6	CO-6 Application of Knowledge: To apply classroom knowledge in real-life rural scenarios, enhancing problem-solving skills and practical learning.
CO 7	CO-7 Promoting Sustainable Practices: To educate villagers about sustainable agricultural and livelihood practices, emphasizing the importance of environmental conservation.

Course: Unit attachment in University/College/KVK /Research Station Attachment

Course Outcomes	Statement
CO 1	CO-1 Skill Development: Equip students with practical knowledge and skills in agricultural practices, laboratory techniques, and modern research methodologies. Develop competencies in handling scientific instruments and performing field trials.
CO 2	CO-2 Practical Knowledge Application: Provide exposure to real-life applications of theoretical concepts learned in classrooms. Enable students to analyze and solve on-ground agricultural challenges.
CO 3	CO-3 Research Familiarity: Introduce students to research station operations and research methodologies, including data collection, analysis, and reporting. Foster a research-oriented mindset.

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CO 4	CO-4 Knowledge of Extension Services: Understand the role of Krishi Vigyan Kendras (KVKs) in technology dissemination and farmer training. Participate in outreach programs, on-farm demonstrations, and training sessions conducted for farmers.
CO 5	CO-5 Collaborative Learning: Facilitate interaction with agricultural scientists, extension workers, and farmers to gain diverse perspectives on agriculture. Promote teamwork in multidisciplinary agricultural projects.
CO 6	CO-6 Exposure to Advanced Techniques: Familiarize students with advanced agricultural techniques like precision farming, integrated pest management, and sustainable resource management. Gain insights into recent innovations in agriculture and their implementation.
CO 7	CO-7 Career Readiness: Prepare students for future roles in academics, research, and extension services. Enhance employability through experience in professional agricultural setups.

Course: 407 Plant Clinic

Course Outcomes	Statement
CO 1	CO-1 Diagnosis of Plant Problems: Develop the ability to identify symptoms of diseases, pests, nutrient deficiencies, and abiotic stresses in plants.
CO 2	CO-2 Integrated Pest and Disease Management (IPDM): Understand and implement IPDM strategies to manage plant health issues sustainably.
CO 3	CO-3 Understanding Plant-Pathogen Interactions: Learn the mechanisms of how pathogens, pests, and environmental factors affect plant growth and productivity.
CO 4	CO-4 Use of Diagnostic Tools and Techniques: Train in the application of modern diagnostic tools, such as microscopy, molecular methods, and field-based techniques.
CO 5	CO-5 Prescribing Solutions: Gain expertise in recommending suitable control measures, including chemical, biological, and cultural practices.

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CO 6	CO-6 Monitoring and Early Warning Systems: Learn to establish monitoring systems for early detection of plant health problems.
CO 7	CO-7 Advisory Services: Prepare to provide guidance to farmers and stakeholders on plant health management.

Course: Agro-Industrial Attachment

Course Outcomes	Statement
CO 1	CO-1 Practical Exposure: Provide students with hands-on experience in agro-industrial operations, enabling them to understand the real-world functioning of agriculture-related industries.
CO 2	CO-2 Skill Development: Develop technical and managerial skills through active participation in various industrial processes, including production, processing, and quality management
CO 3	CO-3 Industry-Academia Interface: Strengthen the connection between educational institutions and industries to align academic training with industrial requirements.
CO 4	CO-4 Understanding Industrial Processes: Familiarize students with the working principles, technologies, and machinery used in agro-industrial units, such as food processing, agrochemicals, or farm machinery.
CO 5	CO-5 Professional Networking: Build relationships with industry professionals, which can help students understand market trends, entrepreneurship opportunities, and career prospects.
CO 6	CO-6 Problem-Solving Ability: Encourage students to identify and analyze real-time challenges in agro-industries and propose innovative solutions.
CO 7	CO-7 Entrepreneurship Development: Inspire entrepreneurial mindset by exposing students to industrial strategies, supply chain mechanisms, and business models in agriculture.
CO 8	CO-8 Value Addition Awareness: Help students understand the importance of value addition in agriculture and its role in enhancing income and sustainability.

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Course: Project Report Preparation, Presentation and Evaluation General Orientation & on campus training by different Faculties

Course Outcomes	Statement
CO 1	CO-1 Skill Development in Research Methodology: Equip students with the knowledge to design and implement research projects systematically. Teach proper techniques for data collection, analysis, and interpretation.
CO 2	CO-2 Enhancing Report Writing Skills: Develop the ability to prepare well-structured, concise, and comprehensive project reports. Focus on correct formatting, citation, and documentation practices.
CO 3	CO-3 Effective Presentation Techniques: Train students to present their research findings clearly and confidently using various tools (e.g., PowerPoint, charts, and graphs). Improve communication skills for academic and professional contexts.
CO 4	CO-4 Evaluation and Feedback Integration: Enable students to critically evaluate research work (their own and others'). Incorporate constructive feedback to refine their research and reporting skills.
CO 5	CO-5 Team Collaboration and Interdisciplinary Exposure: Promote teamwork and exchange of ideas among peers. Foster an understanding of interdisciplinary approaches to problem-solving.
CO 6	CO-6 Practical Exposure through Faculty Training: Gain insights into specialized topics through on-campus training sessions conducted by expert faculty members. Learn from real-world case studies, faculty experiences, and practical demonstrations.
CO 7	CO-7 Career Readiness: Prepare students for professional roles requiring project planning, execution, and reporting skills. Build confidence in handling future academic or industrial projects.
CO 8	CO-8 Critical Thinking and Problem Solving: Develop analytical skills to identify challenges and propose solutions within a project framework.

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Course Outcomes (COs)
8th Semester

Course: Production Technology for Bio agents and Bio fertilizer

Course Outcomes	Statement
CO 1	CO-01 Understanding Bio agents and Bio fertilizers: Familiarize students with the concept, types, and importance of bio agents (e.g., bio control agents like Trichoderma, Bacillus) and bio fertilizers (e.g., Rhizobium, Azotobacter, Mycorrhiza).
CO 2	CO-02 Production Technologies: Equip students with knowledge about the production processes, culture techniques, and maintenance of bio agents and bio fertilizers under laboratory and industrial conditions.
CO 3	CO-03 Formulation and Quality Control: Teach methods for the formulation, packaging, and quality assessment of bio agents and bio fertilizers to ensure their efficacy and shelf life.
CO 4	CO-04 Application Techniques: Train students in the effective application methods of bio agents and bio fertilizers in agriculture for sustainable crop production.
CO 5	CO-05 Environmental and Economic Benefits: Highlight the role of bio agents and bio fertilizers in reducing chemical inputs, improving soil health, enhancing crop productivity, and promoting eco-friendly agricultural practices.
CO 6	CO-06 Entrepreneurial Opportunities: Encourage students to explore entrepreneurship in the bio fertilizer and bio agent production sector as a sustainable business model.

Course: Seed Production and Technology

Course Outcomes	Statement

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CO 1	CO-01 Understanding Seed Science: To provide a thorough understanding of the principles of seed biology, including seed development, physiology, and germination.
CO 2	CO-02 Seed Production Techniques: To learn the methodologies and technologies used in the production of quality seeds for various crops.
CO 3	CO-03 Seed Certification and Quality Control: To understand the standards, procedures, and practices involved in seed certification, labeling, and maintaining quality standards.
CO 4	CO-04 Seed Storage and Preservation: To study the principles and techniques of seed storage, maintaining seed viability, and longevity under various conditions.
CO 5	CO-05 Hybrid Seed Production: To explore techniques for hybrid seed production, including pollination control mechanisms and genetic purity maintenance.
CO 6	CO-06 Seed Health and Testing: To familiarize students with seed testing protocols for germination, vigor, purity, and health.
CO 7	CO-07 Role in Crop Improvement: To highlight the role of quality seed production in improving crop yield, disease resistance, and overall agricultural productivity.

Course: Mushroom Cultivation Technology

Course Outcomes	Statement
CO 1	CO-01 Understanding Mushroom Biology: Learn about the taxonomy, morphology, and physiology of edible and medicinal mushrooms. Understand the ecological role and nutritional importance of mushrooms.
CO 2	CO-02 Cultivation Techniques: Develop skills in the preparation of substrates for mushroom cultivation. Understand the methods of spawn production and management. Learn cultivation practices for different types of mushrooms (e.g., button, oyster, shiitake, and milky mushrooms).
CO 3	CO-03 Post-Harvest Management: Gain knowledge about harvesting, processing, and packaging techniques. Explore value-added products and storage methods to enhance shelf life.

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CO 4	CO-04 Disease and Pest Management: Understand common diseases, pests, and environmental issues affecting mushroom production. Learn preventive and curative measures.
CO 5	CO-05 Economic and Entrepreneurial Skills: Develop an understanding of the commercial potential of mushroom cultivation. Gain knowledge of cost-effective production, market trends, and business planning. Explore opportunities for small-scale and large-scale entrepreneurship.
CO 6	CO-06 Sustainability and Waste Utilization: Learn about sustainable practices in mushroom cultivation. Explore the use of agricultural waste and by-products as substrates for cultivation.
CO 7	CO-07 Practical Applications and Hands-on Training: Engage in hands-on training for setting up mushroom farms and spawn production units.

Course: Soil, Plant, Water and Seed Testing

Course Outcomes	Statement
CO 1	CO-01 Understand Soil Testing: Develop expertise in analyzing soil physical, chemical, and biological properties. Provide recommendations for sustainable soil fertility management based on test results.
CO 2	CO-02 Plant Testing and Analysis: Learn to assess plant tissue for nutrient status to identify deficiencies, toxicities, or imbalances. Integrate plant analysis data with soil tests for efficient nutrient management.
CO 3	CO-03 Water Testing: Evaluate water quality parameters like pH, electrical conductivity, salinity, and contaminant levels for agricultural use. Understand the suitability of water for irrigation and its impact on soil and crop health.
CO 4	CO-04 Seed Testing: Develop skills in determining seed quality, including germination percentage, vigor, moisture content, and purity. Learn methods to ensure high-quality seed production for better crop yields.

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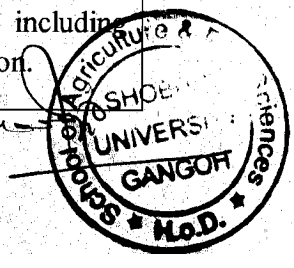
CO 5	CO-05 Promote Sustainable Agriculture: Integrate testing practices to make informed decisions for sustainable and environmentally friendly farming practices.
CO 6	CO-06 Enhance Research and Analytical Skills: Train in the use of advanced instruments and methodologies for precise analysis. Foster critical thinking and problem-solving in agricultural resource management.
CO 7	CO-07 Policy and Advisory Role: Equip participants to work as advisors or policymakers in agriculture, ensuring resource-efficient and sustainable practices are adopted at local and regional levels.

Course: Commercial Beekeeping

Course Outcomes	Statement
CO 1	CO-01 Introduction to Beekeeping: Understanding the fundamentals of beekeeping, including bee biology, behavior, and the role of bees in agriculture and biodiversity.
CO 2	CO-02 Bee Management Practices: Learning how to manage bee colonies effectively for honey production, pollination, and other byproducts like beeswax, propolis, and royal jelly.
CO 3	CO-03 Hive Management: Training on how to maintain and manage beehives, including setting up, inspecting, and maintaining healthy hives for maximum productivity.
CO 4	CO-04 Disease and Pest Control: Understanding common diseases and pests that affect bees and how to manage them to ensure a thriving colony.
CO 5	CO-05 Pollination Services: Exploring the commercial aspects of pollination services for crops, especially for fruit, vegetable, and seed production.
CO 6	CO-06 Honey Harvesting and Processing: Learning the best practices for harvesting honey and other bee products, followed by methods of extraction, processing, and packaging for sale.
CO 7	CO-07 Marketing and Business Skills: Developing the skills needed to run a successful commercial beekeeping operation, including market analysis, business planning, and product distribution.



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Course: Poultry Production Technology

Course Outcomes	Statement
CO 1	CO-01 Understanding Poultry Husbandry: Teaching the basics of poultry farming, including the care, breeding, and management of poultry species such as chickens, ducks, turkeys, and geese.
CO 2	CO-02 Poultry Nutrition: Understanding the nutritional requirements of poultry for different stages of growth (chicks, growers, and layers), including feed formulation and feeding techniques.
CO 3	CO-03 Poultry Health Management: Learning about common diseases in poultry, their prevention, and control measures, along with vaccination schedules and biosecurity practices.
CO 4	CO-04 Poultry Breeding: Gaining knowledge of selective breeding techniques for improving traits like egg production, meat quality, and disease resistance.
CO 5	CO-05 Egg and Meat Production: Developing the skills required to manage egg-laying and meat-producing flocks, ensuring high productivity and quality.
CO 6	CO-06 Poultry Farm Management: Acquiring skills in managing a poultry farm, including housing design, waste management, record-keeping, and financial management
CO 7	CO-07 Poultry Processing and Marketing: Understanding the steps involved in processing poultry products (eggs, meat) for market readiness, along with packaging, storage, and marketing strategies.
CO 8	CO-08 Sustainable Practices: Promoting environmentally sustainable poultry farming practices, including waste management, resource optimization, and minimizing environmental impact.

Course: Commercial Horticulture

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Course Outcomes	Statement
CO 1	CO-01 Understanding Horticultural Practices: Learn about the scientific principles and techniques involved in the cultivation of various horticultural crops, including soil preparation, irrigation, fertilization, and pest management.
CO 2	CO-02 Business and Economic Aspects: Develop the ability to assess the economic viability of horticultural ventures, including cost analysis, market trends, and profitability. Understanding the economics of large-scale horticultural production is crucial for success in commercial farming.
CO 3	CO-03 Sustainable Practices: Focus on the adoption of sustainable farming methods, such as organic farming, integrated pest management (IPM), and water conservation techniques, ensuring long-term productivity without compromising environmental health.
CO 4	CO-04 Advanced Technologies: Explore the use of modern technologies in horticulture, including greenhouse production, hydroponics, precision agriculture, and the application of biotechnology in crop improvement.
CO 5	CO-05 Post-Harvest Management: Understand the techniques for post-harvest handling, storage, and transportation to reduce losses and maintain product quality, which is key to the success of commercial horticultural enterprises.
CO 6	CO-06 Market and Supply Chain Management: Gain insights into market demand, packaging, distribution, and logistics involved in the commercialization of horticultural products, including export opportunities.
CO 7	CO-07 Entrepreneurial Skills: Equip students with entrepreneurial skills to start their own horticulture-based ventures, focusing on innovation, business planning, and financial management.

Course: Floriculture and Landscaping

Course Outcomes	Statement
CO 1	CO-01 Understanding of Floriculture: To provide students with knowledge about the production, cultivation, and management of flowers and ornamental plants. This includes learning about plant

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	varieties, their growth requirements, and techniques for effective flower cultivation.
CO 2	CO-02 Landscape Design Principles: To teach the principles of designing functional, aesthetically pleasing, and sustainable landscapes. This covers aspects such as site analysis, plant selection, design concepts, and landscaping elements (e.g., pathways, fountains, and sculptures).
CO 3	CO-03 Techniques in Landscaping: To equip students with practical skills in landscape maintenance, soil preparation, irrigation, and pest management, which are essential for creating and maintaining beautiful gardens and landscapes.
CO 4	CO-04 Environmental Sustainability: To highlight the role of floriculture and landscaping in promoting environmental sustainability, including water conservation, biodiversity, and reducing carbon footprints through green spaces.
CO 5	CO-05 Economic Aspects of Floriculture and Landscaping: To explore the economic potential of floriculture as a business, including the marketing of flowers, plants, and landscaping services, as well as the role of landscaping in urban development.
CO 6	CO-06 Horticultural Practices: To teach students the various horticultural practices specific to the cultivation of flowers and ornamental plants, such as propagation, pruning, and harvesting.

Course: Food Processing

Course Outcomes	Statement
CO 1	CO-01 Understanding Food Processing Principles: To introduce students to the fundamental principles of food processing, such as preservation, fermentation, freezing, drying, and packaging, and their role in enhancing shelf life, nutritional value, and sensory qualities of food.
CO 2	CO-02 Exploring Different Processing Techniques: To familiarize students with various processing techniques used in the food industry, including thermal processing, refrigeration, dehydration, canning, pasteurization, and extrusion.
CO 3	CO-03 Food Safety and Quality Control: To emphasize the importance of food safety, sanitation, and quality control measures

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	during processing to prevent contamination and ensure that food products meet regulatory standards.
CO 4	CO-04 Impact on Nutritional Content: To examine how different processing methods affect the nutritional content, bioavailability of nutrients, and sensory attributes (taste, color, texture) of food products.
CO 5	CO-05 Technology and Innovation: To expose students to the latest advancements in food processing technology, including automation, use of enzymes, nanotechnology, and other innovative methods for improving efficiency and sustainability in food production.
CO 6	CO-06 Understanding Food Product Development: To equip students with skills in food product formulation and development, enabling them to create new food products based on consumer demands, market trends, and nutritional needs.
CO 7	CO-07 Economic and Environmental Aspects: To analyze the economic feasibility of food processing operations, including cost analysis, resource utilization, and the environmental impact of food processing techniques.
CO 8	CO-8 Practical Application: To provide hands-on experience through laboratory work or industry internships, where students can apply theoretical knowledge to real-world food processing challenges.

Course: Agriculture Waste Management

Course Outcomes	Statement
CO 1	CO-01 Understanding Agricultural Waste: Learn about the types of agricultural waste generated (e.g., crop residues, animal manure, and agro-industrial waste) and their environmental impact.
CO 2	CO-02 Waste Disposal and Recycling: Explore methods for the safe disposal and recycling of agricultural waste to minimize environmental pollution.
CO 3	CO-03 Waste-to-Energy Technologies: Study technologies that convert agricultural waste into energy (e.g., biogas production, biofuels).
CO 4	CO-04 Composting and Soil Health: Understand how agricultural waste can be composted and used to improve soil health and fertility.

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CO 5	CO-05 Environmental Impact Assessment: Evaluate the environmental implications of poor waste management practices and the importance of sustainable waste management in agriculture.
CO 6	CO-06 Policy and Regulation: Study national and international policies, regulations, and standards related to agricultural waste management.

Course: Organic Production Technology

Course Outcomes	Statement
CO 1	CO-01 Understanding Organic Farming Principles: Introduce students to the fundamental principles of organic farming, emphasizing the importance of sustainability, biodiversity, and soil health.
CO 2	CO-02 Techniques of Organic Crop Production: Equip students with knowledge of various organic farming practices such as crop rotation, composting, green manure, mulching, and organic pest management
CO 3	CO-03 Soil Health Management: Teach students how organic production emphasizes soil fertility through the use of organic matter, bio-fertilizers, and soil-friendly techniques, avoiding chemical inputs.
CO 4	CO-04 Organic Inputs and Fertilization: Focus on the sources and use of organic fertilizers, including compost, vermicomposting, bio fertilizers, and plant-based nutrient amendments.
CO 5	CO-05 Certification and Standards: Provide knowledge on organic certification processes, standards, and regulations to ensure products meet the requirements for organic labeling.
CO 6	CO-06 Pest and Disease Management in Organic Systems: Teach students how to manage pests and diseases through non-chemical means like biological control, physical methods, and plant resistance.

Course: Commercial Sericulture

Course Outcomes	Statement

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CO 1	CO-1 Understanding Sericulture Basics: To introduce students to the history, principles, and biology of sericulture, focusing on silk-producing organisms, particularly silkworms (Bombyx mori).
CO 2	CO-2 Silkworm Rearing Techniques: To train students in the various techniques involved in silkworm rearing, including the selection of appropriate breeds, feeding, and care of silkworms to enhance silk production.
CO 3	CO-03 Silk Cocoon Production: To impart knowledge about cocoon harvesting, handling, and processing for commercial silk production.
CO 4	CO-04 Sericulture Infrastructure: To educate students on setting up and managing a sericulture farm, including the design of rearing houses, mulberry cultivation for silkworm feed, and other necessary infrastructure.
CO 5	CO-05 Economic Aspects: To explore the economic potential of sericulture, including cost analysis, profit margins, market trends, and the development of a business model.
CO 6	CO-06 Post-harvest Processing: To provide hands-on training in processing cocoons into silk threads, including reeling, twisting, dyeing, and weaving.
CO 7	CO-07 Sustainability in Sericulture: To discuss sustainable sericulture practices, pest management, and environmental concerns associated with silk farming.

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