-	-				DEPARTMENT	OF BOTANY		
			1.1.1		(2021-2023)	B.Sc. I	a a a a a a a a a a a	
Details	s of Cross	Details of	Cross Cutting I	ssues relevant with	Gender Awareness,	Environmental Aw	areness, Professional E	Ethics and Human Values
Sr. No.	Name of the Cours e	Semes ter	Title of paper	Name of the Unit	Details of Cross Cu			
					Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
1	B.ScI (2021 -23)	1	Paper I: Microbes, Algae and, Biofertilizer s	1. Microbes, 1.1 Viruses	influences vulnerability	spread and evolution, habitat destruction.	Cultural sensitivity and awarenes	biosecurity, human rights, socia justice, and equity
				1.2. Bacteria	influences vulnerability	spread and evolution, habitat destruction.	Cultural sensitivity and awarenes	biosecurity,human rights, social justice, and equity
				2 Algae and Biofertilizer 2.1. Algae	Focus on individual growth	Cycles of Life and Death, Ecological Identity	Cultural sensitivity and awarenes	biosecurity and equity
				2.2.Biofertilizer	Equal Access and Participation, Empowerment Opportunities	eco-friendly alternative,pro mote sustainable agriculture,miti gate climate change	Cultural sensitivity and awarenes	improve human well-being, health, and nutrition

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		1	Ppaer II: Cell Biology and Analytical techniques	1. Cell Biology	Inclusive Representation,	Sustainable Practices-waste management, energy use, and reduction of hazardous materials.	proper use of biological materials, and ethical treatment of experimental subjects.	Respect for Diversity,Health and Safety
				2. Analytical techniques, 2.1. Microscopy	Inclusive Representation and Equal Opportunity	Sustainable Laboratory Practices,Minim izing Environmental Impact,Green Technologies	Ethical Use of Samples, Transparency and Replication	Health and Safety,Ethical Considerations in Research
				2.2. Chromatography	Inclusive Representation and Equal Opportunity	Sustainable Practices,Chemi cal Management,G reen Chromatograph v	Ethical Use of Chemicals,Transpar ency and Reproducibility	use of personal protective equipment (PPE), proper handling of chemicals, and adherence to safety protocols
1	B.ScI (2021 -23)	11	Paper III: Mycology, Phytopatho logy and Mushroom cultivation	1. Mycology, 1.1 Fungi	influences vulnerability	Cycles of Life and Death, Ecological Identity	Cultural sensitivity and awarenes	biosecurity,human rights, social justice, and equity
				1.2 Lichen	Representation, equity	Conservation and Protection, Sustainable Practices	Respect for Ecosystems	Ethical Considerations, ultural significance of lichens in various communities

			2.Phytopatholog y and Mushroom cultivation 2.1 Phytopathology	influences vulnerability	mportance of sustainable agricultural practices and integrated pest management to reduce the environmental impact	honest data collection, accurate reporting	Encourage the responsible communication,
			2.2 Mushroom cultivation	Equal Access and Participation, Empowerment Opportunities	organic substrates, reducing waste, and managing water use efficiently.	Ethical Treatment of Materials	broader impact of cultivation practices on communities and ecosystems.
401010 146 july	H A H A L A L A L A L A L A L A L A L A L A L	Paper IV: Archegonea tes (Bryophytes , Pteridophyt es and Gymnosper ms)	1 Archegoneate andBryophytes, 1.1 Archegoneate	Representation, equity	Ecosystem Role,Conservati on Efforts, biodiversity	Ecology, sustainability	Diversity, biosecurity
			1.2 Bryophytes	Representation, equity	Ecosystem Role,Conservati on Efforts, biodiversity	Ecology, sustainability	Diversity, biosecurity
			<ul><li>2. Pteridophytes and</li><li>Gymnosperms,</li><li>2.1</li><li>Pteridophytes</li></ul>	Representation, equity	Conservation, climate change	Cultural sensitivity and awarenes	Diversity, biosecurity



	2.2 Gymnosperms,	Representation, equity	Conservation, climate change , ecosystem services	Cultural sensitivity and awarenes	cultural significance, educational value and conservation ethics
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				OF BOTANY 2022-2023 B			
1175 · · · · · · · · · · · · · · · · · · ·		1	Cross Cutting Issues relevant with Ger				uman Values
Name	Title of	Sem	Name of the Unit	Details of Cross Cuttin			C. C. L. L. L. C.
of the Course	Paper	•		Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
B.ScII Botany (2019- 2023)	Paper V Embryology of Angiosperm s	III	1.a Organisation of Flower.	Inclusive language: Use gender-neutral language when describing flower structure and function. Representation: Highlight contributions of female botanists and scientists in understanding plant reproduction.	Ecological importance: Emphasize the crucial role of flowers, pollination, and fertilization in maintaining ecosystem balance. Conservation: Discuss the impact of environmental changes on plant reproduction and pollinator populations.	Accuracy: Ensure precise and accurate descriptions of flower structure and function. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	Appreciation for nature: Foster appreciation and wonder for the complexity and beauty of plant reproductive structures. Respect for diversity: Emphasize the importance of plant diversity and the impact of human activities on ecosystems.
	1 States	1	1.b Pollination and Fertilization	Equal opportunities: Ensure equal access	Sustainability: Promote	Responsible research:	Responsible stewardship:
				to education and research opportunities in plant reproductive biology	sustainable practices in agriculture and horticulture to protect pollinators and plant diversity.	Conduct research on plant reproduction with consideration for environmental	Encourage responsible stewardship of the natural world and promote



			and social implications.	sustainable practices.
2.a Embryo and Endosperm development.	nclusive language: Use gender-neutral language when describing embryonic development and reproductive processes. Representation:	Ecological significance: Emphasize the importance of understanding plant embryology for sustainable agriculture and conservation.	Accuracy and precision: Ensure accurate and precise descriptions of embryonic development and reproductive processes.	Curiosity and wonder: Foster curiosity and appreciation for the complex processes of plant embryonic development. Respect for
	Highlight contributions of female scientists in understanding plant embryology and reproduction.	Environmental impact: Discuss the impact of environmental factors on plant embryonic development and reproductive success.	Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	nature: Emphasize the importance of understanding and respecting plant reproductive processes.
2.b Polyembryony and Apomixis	Equal opportunities: Ensure equal access to education and research opportunities in plant developmental biology.	Climate change: Consider the effects of climate change on plant reproduction and development.	Responsible research: Conduct research on plant embryology with consideration for environmental and social	Responsible innovation: Encourage responsible innovation in agriculture and biotechnology, considering

						implications.	ethical implications.
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		1	Cross Cutting Issues relevant with Ge	Details of Cross Cuttin			uman Values
Name of the Course	Title of Paper	Sem	Name of the Unit	Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
B.ScII Botany (2019- 2023)	Paper VI Plant Physiology		1.a Plant Water Relationship	Inclusive language: Use gender-neutral language when describing plant water relationships and mineral nutrition. Representation: Highlight contributions of female scientists in understanding plant water relations and mineral nutrition.	Water conservation: Emphasize the importance of water conservation in agriculture and plant growth. Sustainable practices: Discuss sustainable practices for mineral nutrient management and plant nutrition.	Accurate representation: Accurately represent plant water relationships and mineral nutrition in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	Appreciation for nature: Foster appreciation for the complex relationships between plants water, and minerals. Responsible stewardship: Encourage responsible stewardship of water and mineral resources for sustainable agriculture.



1.b Mineral Nutrition	Equal opportunities: Ensure equal access to education and research opportunities in plant physiology.	Climate change: Consider the impact of climate change on plant water relationships and mineral nutrition.	Responsible research: Conduct research on plant water relationships and mineral nutrition with consideration for environmental and social implications.	Food security: Emphasize the importance of understanding plant water relationships and mineral nutrition for global food security.
2.a Photosynthesis	Inclusive language: Use gender-neutral language when describing plant photosynthesis,	Ecological significance: Emphasize the crucial role of plant photosynthesis in	Accurate representation: Accurately represent plant photosynthesis,	Appreciation for nature: Foster appreciation for the complexity and beauty of
	growth, and development. Representation: Highlight contributions of female scientists in understanding plant photosynthesis and development.	supporting life on Earth. Climate change: Discuss the impact of climate change on plant growth and development.	growth, and development in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	plant growth and development. Responsible stewardship: Encourage responsible stewardship of plant resources for sustainable development.
2.b Growth and Development	Equal opportunities: Ensure equal access to education and research opportunities in plant biology.	Sustainability: Highlight sustainable practices for plant growth and development, such	Responsible research: Conduct research on plant photosynthesis, growth, and	food security: Emphasize the importance of understanding plant photosynthesis,

					as reducing waste and conserving resources.	development with consideration for environmental and social implications.	growth, and development for global food security.
				TMENT OF BOTANY			
Det Name of the Course	Title of Paper	Sem	Cross Cutting Issues relevant with Gende Name of the Unit		ental Awareness, Prof ng Issues relevant wit Environmental Awareness		uman Values Human Values
B.ScII Botany (2019- 2023)	Paper VII Plant Anatomy	IV	1.a Organization of higher plant body	Inclusive language: Use gender-neutral language when describing plant structure and development. Representation: Highlight contributions of female botanists and scientists in understanding plant anatomy.	Ecological significance: Emphasize the importance of plant structure and function in supporting ecosystems. Sustainability: Discuss sustainable practices for plant growth and development, such as reducing waste and conserving resources.	Accurate representation: Accurately represent plant structure and development in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	Appreciation for nature: Foster appreciation for the complexity and beauty of plant structure and development. Responsible stewardship: Encourage responsible stewardship of plant resources for sustainable development.



1.b Meristematic and Permanent tissue	Equal opportunities: Ensure equal access to education and research opportunities in plant biology.	Conservation: Highlight the impact of human activities on plant diversity and ecosystems.	Responsible research: Conduct research on plant anatomy with consideration for environmental and social implications.	Curiosity and wonder: Inspire curiosity and wonder about plant biology and its importance in our lives.
2.a Primary and Secondary structure of plant body	Representation: Highlight contributions of female botanists and scientists in understanding plant anatomy.	Ecological significance: Emphasize the importance of plant structure and function in supporting	Accurate representation: Accurately represent plant structure and development in research and	Appreciation for nature: Foster appreciation for the complexity and beauty of plant structure and
	Inclusive language: Use gender-neutral language when describing plant structure and development.	ecosystems. Sustainability: Discuss sustainable practices for plant growth and development, such as reducing waste and conserving resources.	teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	development. Responsible stewardship: Encourage responsible stewardship of plant resources for sustainable development.
2.b Tissue systems	Equal opportunities: Ensure equal access to education and research opportunities in plant biology.	Conservation: Highlight the impact of human activities on plant diversity and ecosystems.	Responsible research: Conduct research on plant anatomy with consideration for environmental and social	Curiosity and wonder: Inspire curiosity and wonder about plant biology and its importance in our lives.

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			Sector States of the			implications.	
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Name	tails of Cross De	1		ith Gender Awareness, Environm			luman Values
of the Course	Paper	Sem	Name of the Unit	Gender Awareness	ng Issues relevant with Environmental Awareness	h Professional Ethics	Human Values
B.ScII Botany ( 2019- 2023)	Paper VIII Plant Metabolism	IV	1.a Enzymes	Inclusive language: Use gender-neutral language when describing plant water relationships and mineral nutrition. Representation: Highlight contributions of female scientists in understanding plant water relations and mineral nutrition.	Water conservation: Emphasize the importance of water conservation in agriculture and plant growth. Sustainable practices: Discuss sustainable practices for mineral nutrient management and plant nutrition.	Accurate representation: Accurately represent plant water relationships and mineral nutrition in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	Appreciation for nature: Foster appreciation for the complex relationships between plants, water, and minerals. Responsible stewardship: Encourage responsible stewardship of water and mineral resources for sustainable agriculture.

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1.b Nitrogen Metabolism	Equal opportunities: Ensure equal access to education and research opportunities in plant physiology.	Climate change: Consider the impact of climate change on plant water relationships and mineral nutrition.	Responsible research: Conduct research on plant water relationships and mineral nutrition with consideration for environmental and social implications.	Food security: Emphasize the importance of understanding plant water relationships and mineral nutrition for global food security.
2.a Respiration	Inclusive language: Use gender-neutral language when describing enzymes and nitrogen	Ecological significance: Emphasize the importance of enzymes and	Accurate representation: Accurately represent enzyme function	Appreciation for nature: Foster appreciation for the complexity
	metabolism. Representation: Highlight contributions of female scientists in understanding enzyme function and nitrogen metabolism.	nitrogen metabolism in ecosystem balance. Conservation: Highlight the impact of human activities on nitrogen cycles and ecosystems.	and nitrogen metabolism in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	of enzyme function and nitrogen metabolism. Responsible stewardship: Encourage responsible stewardship of nitrogen resources for sustainable development.

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	2.b Seed Dormancy and Germination	Equal opportunities: Ensure equal access to education and research opportunities in biochemistry.	Sustainability: Discuss sustainable practices for nitrogen management and enzyme use.	Responsible research: Conduct research on enzymes and nitrogen metabolism with consideration for environmental and social implications.	Curiosity and wonder: Inspire curiosity and wonder about biochemical processes and their importance in life.
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			1.1.1.	De	epartment of Botany (B.Sc.	III)		and the state of the		
	Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values									
Sr	Name of	Title of	Se	Name of the Unit	Details of Cross Cut	tting Issues relevant w	ith			
N 0.	the Course	Paper	m.		Gender Awareness	Environmental Awareness	Professional Ethics	Human Values		
1	B.Sc. III (2020- 2023)	DSE –E25 Genetics and Plant Breeding	V	Unit 1: Mendelism:	understand sex- specific diseases and disorder; develop gender- tailored medical tretment; enhances our understanding of gender identity and expression	To understand of How enviormnetal factor interact with Mendial genetics to shape plant growth development and adaptions	Aplication of mendelian genetics in various, including research, medicine, agriclture and biotechnology these ethics- environmental responsibilty, respect for person; justics, autonomy, confidentiality	Respect for human life; Improvemnet of human and plan life; relif of suffering; Mendelian gentics to improves human life and society, while minimizing potenital risks and harms		



Unit 2 : Linkage and Recombination	genetic process differ between males and feamles particular in relation to sex chromsomes; develop gender- tailored genetic counseling and testing;improve crop breeding program; traides differences and their behavior.	Linkage: Enviormental stress can incresae or decrease recombition rates, affecting genetic diversity, temapture radiation and chemical exposure can alter recombination frequency and disrtibution	- Address complex issues with multifaceted ethical approaches - Promote consistency and coherence in professional ethics - Encourage ongoing refinement and evolution of ethical principle	Linkage and recombination are terms typically used in genetics to describe the physical connection between genes on a chromosome and the shuffling of genetic material during reproduction. However, if we interpret your question more broadly, we can
				explore the connection and recombination of human ethics in various contexts.
Unit 3: Chromosomes structure and Variation	gender identity exists beyond the binary male/ female; Gender expression and identity can vary widely; respecting and affirming indiviuals self iddentifed gender	enviornmanetal factor impact the structure, function and organization of chromosomes genes and genome	Confidentiality and privacy; Informed consent; Accurate interpretation and counseling; Transparency and accountability; Continuing education and training	Chromosomes, the thread-like structures within our cells, carry genetic information that shapes who we are. Variations in chromosomes can lead to differences in traits, susceptibility to diseases, and

				even influence behavior. Here's how chromosome structure and variation relate to human ethics:
Unit 4: Plant Breeding	understanding plant sex gender; gender specific traits; promoting gender quality; social and cultural implication	Develop climate - resilient crop; improve resources use efficiency; enhances ecosystem services; conserve genetic diversity	Transparency and open communication; Responsible innovation; Intellectual property and ownership; Environmental stewardship	Prioritize transparency, inclusivity, and public engagement.; Consider diverse perspectives and values in breeding decisions.; . Implement equitable access and benefit- Monitor and mitigate potential negative consequences.shari ng mechanisms.



2	B.Sc. III (2020- 2023)	Paper- XDSE –E26 Microbiolo gy, Plant Pathology and Mushroom Culture Technolog Y	V	Unit 1: Microbiology	Diversity in the lab: Inclusive language and practices; Research focus and applications; Role models and mentorship; Addressing biases and barriers:; Gender-sensitive research methods:	Education and outreach; Water quality and management; Agroecology and sustainable agriculture; Microplastics and pollution; Environmental monitoring; Pollution and remediation	<ol> <li>Responsible research practices</li> <li>Biosafety and biosecurity:</li> <li>Informed consent:</li> <li>Confidentiality and data protection:</li> </ol>	1. Vaccine development and distribution 2. Infection control and public health 3. Antimicrobial resistance and stewardship; 4. Microbiome research and manipulation; 5.Synthetic biology and bioengineering; 6. Biodefense and dual-use research
				Unit 2: Industrial Microbiology	Diversity in the lab: Inclusive language and practices; Research focus and applications; Role models and mentorship; Addressing biases and barriers:; Gender-sensitive research methods:	Education and outreach; Water quality and management; Agroecology and sustainable agriculture; Microplastics and pollution; Environmental monitoring; Pollution and remediation	<ol> <li>Responsible research practices</li> <li>Biosafety and biosecurity:</li> <li>Informed consent:</li> <li>Confidentiality and data protection:</li> </ol>	1. Vaccine development and distribution 2. Infection control and public health 3. Antimicrobial resistance and stewardship; 4. Microbiome research and manipulation; 5.Synthetic biology and bioengineering; 6. Biodefense and dual-use research

Unit 3: Plant Pathology	Diverse Representation	Climate and Weather, Soil Health, Topography and Microclimates	Overview of ethical principles and their importance in scientific research and practice. Key ethical values: honesty, integrity, responsibility, and fairness. Ethical Standards and Guidelines	Incorporating human values into plant pathology emphasizes the ethical and social dimensions of research and practice, ensuring that scientific activities contribute positively to society and respect fundamental principles
Unit 4: Mushroom Technology	Representation in Research, Inclusivity in Education and Outreach, Technology and Accessibility, Ethical Considerations	Bioremediation, Waste Management, Sustainable Materials, Carbon Sequestration, Soil Health and Agriculture	Environmental Responsibility, Safety and Health, Transparency and Honesty, Respect for Biodiversity, Intellectual Property and Collaboration, Regulatory Compliance	Sustainability, Health and Safety, Innovation and Progress, Integrity and Honesty, Respect for Nature, Social Responsibility, Empathy and Compassion



3	B.Sc. III (2020- 2023)	Paper- XI DSE –E27 Cytology and Research Technique s in Biology	V	Unit 1: Cell as a unit of life	This is about ensuring that people of all genders have equal rights, responsibilities, and opportunities. It involves addressing and challenging stereotypes, discrimination, and inequities.	Cellular Homeostasis, Signal Transduction, Adaptation and Evolution, Environmental Impact on Cellular Function, Biomonitoring and Environmental Indicators	Integrity and Honesty, Respect for Life, Confidentiality, Compliance with Regulations, Ethical Use of Resources, Education and Mentorship, Public Engagement	Biological Significance, Health and Disease, Philosophical and Ethical Implications, Human Dignity, Interconnectedness and Unity
				Unit 2: Cell Organelles	Awareness: Increasing knowledge about gender diversity and challenging stereotypes.	Pollution and Toxins, Climate Change, Radiation, Heavy Metals and Chemical Exposure, Nutrient Deficiencies,	Human and Animal Welfare, Consent and Privacy, Research Integrity, Gene Editing and Synthetic Biology, Clinical Applications, Education and Training	Nucleus - Leadership and Vision, Mitochondria - Energy and Resilience, Endoplasmic Reticulum (ER) - Collaboration and Communication, Vacuoles - Reflection and Contentment, Cytoskeleton - Stability and
					LADAM A. S. COL			Support, Peroxisomes - Responsibility and Care

Unit 3: Sub Cellular Structures and Cell Membrane	Advocacy: Promoting policies and practices that support gender inclusivity and address gender- based discrimination.	Pollution and Toxins, Climate Change, Radiation, Heavy Metals and Chemical Exposure, Nutrient Deficiencies,	Research Integrity, Accuracy and Honesty, Responsible Conduct in Research, Ethical Treatment of Biological Materials, Ethical Implications of Biotechnological Applications, Education and Training	Respect for Life, Human Dignity, Animal Welfare, Integrity and Honesty, Responsibility and Accountability, Compassion and Empathy, Respect for Diversity, Education and Knowledge Sharing
Unit 4: Research Techniques in Biology	Both research techniques in biology and gender awareness involve methods and approaches for gathering and analyzing information, but they are applied in very different contexts.	Field Surveys and Observations, Remote Sensing, Ecological Modeling, Genetic Analysis, Bioinformatics, Experimental Manipulations, Long-term Ecological Research	Research Integrity, Accuracy and Honesty, Responsible Conduct in Research, Ethical Treatment of Biological Materials, Ethical Implications of Biotechnological Applications, Education and Training	Ethical Considerations in Research, Human Values Reflected in Research Techniques, Social Responsibility and Public Engagement, Technological and Methodological Considerations, Education and Training



4	B.Sc. III (2020- 2023)	Paper- XII DSE-E28 Horticultur e and Gardening	V	Unit 1: Importance and divisions of Horticulture	Diverse Perspectives and Innovations, Equitable Opportunities, Addressing Historical Imbalances, Improved Collaboration and Productivity, Educational Access, Career Opportunities, Research and Development, Workplace Culture, Consumer Perspectives, Policy and	Field Surveys and Observations, Remote Sensing, Ecological Modeling, Genetic Analysis, Bioinformatics, Experimental Manipulations, Long-term Ecological Research	Research Integrity, Accuracy and Honesty, Responsible Conduct in Research, Ethical Treatment of Biological Materials, Ethical Implications of Biotechnological Applications, Education and Training	Ethical Considerations in Research, Human Values Reflected in Research Techniques, Social Responsibility and Public Engagement, Technological and Methodological Considerations, Education and Training
				Unit 2: Horticultural Produce and Management of Pest and diseases	Advocacy Diverse Perspectives and Innovations, Equitable Opportunities, Addressing Historical Imbalances, Improved Collaboration and Productivity, Educational	Sustainable Practices, Water Conservation, Biodiversity, Waste Reductio, Climate Change Mitigation, Education and Advocacy, Soil Health	Sustainable Practices, Safety and Health, Honesty and Integrity, Professional Competence, Continuous Learning, Skill Development, Respect for Clients and	Respect for Nature, Commitment to Sustainability, Ethical Responsibility, Empathy and Compassion, Education and Knowledge Sharing

	Access, Career Opportunities, Research and Development, Workplace Culture, Consumer Perspectives, Policy and Advocacy		Communities, Ethical Plant Sourcing	
Unit 3: Nursery	rowing and consuming fresh produce can improve health and well-being. Gardening is also associated with psychological benefits, including stress relief and increased physical activity.	Nature Exploration, Gardening Projects, Recycling and Waste Management, Environmental Books, Sustainable Practices, Eco- Friendly Product, Art and Expression	Environmental Responsibility, Honesty and Transparency, Customer Respect and Service, Integrity in Business Practices, Compliance with Regulations	Sustainability, Health and Safety, Innovation and Progress, Integrity and Honesty, Respect for Nature, Social Responsibility, Empathy and Compassion



			Unit 4: Landscape Gardening	Landscape gardening involves the design, installation, and maintenance of outdoor spaces to enhance their aesthetic, functional, and ecological qualities. It blends art and science to create environments that are both beautiful and practical.	Native Plants, Water Conservation, Soil Health, Biodiversity, Sustainable Design, Waste Reduction, Education and Community Engagement	Environmental Responsibility, Honesty and Transparency, Customer Respect and Service, Integrity in Business Practices, Compliance with Regulations	Sustainability, Health and Safety, Innovation and Progress, Integrity and Honesty, Respect for Nature, Social Responsibility, Empathy and Compassion
5	B.Sc. III (2020- 2023)	Paper- XIII VI DSE –F25 Plant Biochemist ry and Molecular Biology	Unit 1: Carbohydrates	Carbohydrates are essential macronutrients that serve as a major source of energy for the body. They are made up of carbon, hydrogen, and oxygen	Agricultural Practices, Climate Change,Greenhous e Gas Emissions, Sustainable Practices, Food Choices, Dietary Shifts,	Nutrition and Dietary Advice, Food Industry Practices, Agricultural Ethics, Public Health, Research Integrity, Patient Confidentiality	Human Rights, Research Ethics, Cultural Ser sittivity, Agricu Haal and Environm. To! Impact



Unit 2 : Lipids	Lipids are a diverse group of organic compounds that are insoluble in water but soluble in organic solvents. They play several crucial roles in biological systems	Pollution and Contamination, Biodegradation, Biodiversity and Ecosystems, Climate Change, Sustainable Practices	Integrity in Research, Responsible Application, Environmental Impact, Animal Welfare	Health and Well- being, Sustainability, Equity and Accessibility, Scientific Integrity, Cultural Sensitivity
Unit 3: Proteins	Proteins are essential macromolecules made up of amino acids. They play numerous vital roles in the body, including structural, functional, and regulatory functions.	Resource Efficiency, Greenhouse Gas Emissions, Land Use and Deforestation, Water Consumption, Waste and Pollution,	Scientific Integrity, Respect for Human and Animal Subjects, Privacy and Confidentiality, Ethical Use of Genetic Information,	Human Health and Safety, Animal Welfare, Environmental Impact, Equity and Access, Education and Communication, Professional Conduct
Unit 4: Nucleic Acids	Nucleic acids are fundamental biomolecules essential for storing and transferring genetic information. There are two main types: DNA	Biodiversity Monitoring, Pollution Detection and Management, Genetically Engineered Organisms, Microbial Bioremediation, Gene Expression	Scientific Integrity, Respect for Human and Animal Subjects, Privacy and Confidentiality, Ethical Use of Genetic Information,	Respect for Life, Human Dignity, Animal Welfare, Integrity and Honesty, Responsibility and Accountability, Compassion and Empathy, Respect for Diversity,

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			(deoxyribonucleic acid) and RNA (ribonucleic acid).	Studies, Genetic Adaptation, Genetic Diversity		Education and Knowledge Sharing
3.Sc. III 2020- 2023) Paper- XIV DSE –F26 Bioinforma tics, Biostatistic s and Economic Botany	VI	Unit 1: Bioinformatics	Bioinformatics is the interdisciplinary field that combines biology, computer science, and information technology to analyze and interpret biological data. It plays a crucial role in understanding complex biological processes and advancing personalized medicine.	Biodiversity Monitoring, Pollution Detection and Management, Genetically Engineered Organisms, Microbial Bioremediation, Gene Expression Studies, Genetic Adaptation, Genetic Diversity, Environmental DNA (eDNA), Climate Change Impact, Pollution Effects, Ecosystem Function and Health, Conservation	Scientific Integrity, Respect for Human and Animal Subjects, Privacy and Confidentiality, Ethical Use of Genetic Information,	Respect for Privacy, Equity and Fairness, Integrity and Honesty, Beneficence and Non-Maleficence, Positive Impact, Commitment to Social Responsibility, Collaboration and Respect

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	distribution, and consumption of these plant-based resources.			
Unit 4: Economic Botany: Spices, Beverages and Fibers	Economic Botany is the study of plants that are of economic importance to humans. This includes their use as spices, beverages, and fibers. Gender awareness in this context involves understanding how gender influences and is influenced by the production, distribution, and consumption of	Sustainable Practices, Water Conservation, Biodiversity, Waste Reductio, Climate Change Mitigation, Education and Advocacy, Soil Health, Conservation Efforts, Climate Change Adaptation, Bioprospecting	Respect for Indigenous Knowledge and Rights, Sustainable Practices, Transparency and Honesty, Intellectual Property Rights, Ethical Research Practices	Sustaining Livelihoods, Health and Medicine, Food Security, Economic Development, Educational and Scientific Advancements

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7	B.Sc. III (2020- 2023)	Paper- XV DSE –F27 Plant Biotechnol ogy and Paleobota ny	VI	Unit 1: Plant Biotechnology	ant Biotechnology and gender awareness intersect in various ways, particularly in how technology impacts	Genetically Modified Crops, Bioremediation, Conservation of Biodiversity, Climate Change Mitigation, Sustainable	Environmental Impact, Food Safety and Nutrition, Socioeconomic Considerations, Ethical Research	Ethical Responsibility, Sustainability, Equity and Access, Cultural Sensitivity, Transparency and Public Engagement
					agricultural practices, research opportunities, and economic benefits.	Sustainable Agriculture	Practices, Animal Welfare, Public Engagement and Education	
				Unit 2: Recombinant DNA Technology	Recombinant DNA Technology and gender awareness intersect in important ways, especially in the contexts of	Bioremediation, Protecting Endangered Species, Genetic Resilience, Research and Collaboration,	Safety and Risk Management, Informed Consent, Professional Integrity, Compliance with	Respect for Human Dignity, Beneficence and Non-Maleficence, Justice and Fairness

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	research, biotechnology applications, and policy development.	Regulation and Monitoring, Ecological Impact, Public Engagement	Regulations, Equity and Access	
Unit 3: Plant Tissue Culture	1. Inclusive research teams; 2.Gender-sensitive research design 3. Empowering women farmers: 4. Addressing gender disparities5. Gender-aware extension services 6.Inclusive language and communication 7. Supporting women in STEM	1. Using renewable energy sources 2. Implementing waste reduction and recycling strategies 3. Developing resource-efficient systems; 4. Ensuring proper containment and management of plant species; 5. Promoting sustainable agriculture practices	Responsible research practices: 2.Proper citation and credit 3. Intellectual property respect 4. Biosafety and biosecurity 5. Informed consent 6. Confidentiality and data protection 7.Collaboration and mentorship	1. Sustainability; 2. Food security; 3. Health and wellness; 4. Environmental stewardship; 5. Economic growth; 6. Cultural preservation 7. Education and innovation 8. Equity and access 9. Global cooperation



				Unit 4: Paleobotany	Highlighting Contributions, Encouraging Diversity, Addressing Bias, Supporting Networks	Climate Reconstruction, Ecosystem Changes, Biodiversity Insights, Carbon Cycle Studies	Integrity in Research, Respect for Fossil Sites, Cultural Sensitivity, Environmental Responsibility,	Exploring Ancient Plant-Based Medicines, Conserving Biodiversity, Paleoclimatology and Public Health
8	B.Sc. III (2020- 2023)	Paper- XVI DSE –F28 Bio fertilizers and Herbal Drug Technolog Y	VI	Unit 1: Biofertilizers	Access and Participation, Training and Education, Impact Assessment, Policy and Support	Reduction in Chemical Inputs, Enhanced Soil Health, Decreased Greenhouse Gas Emissions, Support for Biodiversity, Sustainable Farming Practices	Patient Safety and Well-being, Confidentiality and Privacy,Profession al Competence, Honesty and Integrity	Compassion, Respect, Integrity, Responsibility, Equity, Education
				Unit 2: Herbal Medicines	Different Health Needs, Historical and Cultural Context, Access and Use,Research and Representation, Psychosocial Factors	Sustainable Sourcing, Biodiversity Conservation, Organic Farming, Climate Change Impact, Waste Reduction	Patient Safety and Well-being, Informed Consent, Competence and Continuous Learning,Confiden tiality, Integrity and Honesty	Holistic Care, Respect for Nature, Cultural Heritage and Tradition, Empowerment and Autonomy, Compassion and Empathy,



	Unit 3: Herbal cosmetology	Being mindful of the diverse experiences and identities within the community. This includes acknowledging non-binary and gender non- conforming individuals in both product development and marketing.	Ethical Harvesting: Ensure that herbs and plants are harvested in a way that maintains ecological balance. This includes avoiding overharvesting and using methods that do not damage natural habitats.	Ingredient Disclosure: Clearly list all ingredients used in products, including any potential allergens or harmful substances. Transparency helps consumers make informed choices and builds trust. Marketing Claims: Avoid misleading or exaggerated claims about the benefits of herbal products. Provide accurate information based on scientific evidence and regulatory standards.	The sourcing of herbal ingredients should be done ethically. This includes ensuring that plants are harvested sustainably and that the practices do not harm the environment or deplete local resources. Fair trade principles and respect for indigenous knowledge and rights are also crucial, ensuring that local communities benefit from the use of their traditional plants.
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Unit 4: Herbal cosmetology	Being mindful of the diverse experiences and identities within the community. This includes acknowledging non-binary and gender non- conforming individuals in both product development and marketing.	Ethical Harvesting: Ensure that herbs and plants are harvested in a way that maintains ecological balance. This includes avoiding overharvesting and using methods that do not damage natural habitats.	Ingredient Disclosure: Clearly list all ingredients used in products, including any potential allergens or harmful substances. Transparency helps consumers make informed choices and builds trust. Marketing Claims: Avoid misleading or	The sourcing of herbal ingredients should be done ethically. This includes ensuring that plants are harvested sustainably and that the practices do not harm the environment or deplete local resources. Fair trade principles and respect for indigenous
			exaggerated claims about the benefits of herbal products. Provide accurate information based on scientific evidence and regulatory standards.	knowledge and rights are also crucial, ensuring that local communities benefit from the use of their traditional plants.

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HEAD, Department of Botany (PG/UG) Dattajirao Kadam Arts, Science & Commerce College, Ichalkaranji

			DATTAJIR	AO KADAM ARTS,	SCIENCE AND CO	OMMEREC COLLEGE, I	CHALKARANJI	
				DEPAR	TMENT OF BOTA	NY 2018-2022		
Deta	ails of Cro	oss Details o	of Cross Cutting I	ssues relevant wit	h Gender Aware Values	nesss, Environmental	Awarenesss, Professio	nal Ethics and Human
Sr. No.	Name of the Cours e	Semeste r	Title of paper	Name of the Unit	Details of Cros	s Cutting Issues releva	ant with	
					Gender Awarenesss	Environmental Awarenesss	Professional Ethics	Human Values
1	B.Scl (2018 -19 - 2020- 21 )	1	Paper I: Biodiversity of Microbes, Algae and Fungi	1. Microbes 1a. Viruses	influences vulnerability	spread and evolution, habitat destruction.	Cultural sensitivity and awareness	biosecurity,human rights, social justice, and equity
				1b. Bacteria	influences vulnerability	spread and evolution, habitat destruction.	Cultural sensitivity and awareness	biosecurity, human rights, social justice, and equity
				2 Algae and Fungi 2a. Algae	Focus on individual growth	Cycles of Life and Death, Ecological Identity	Cultural sensitivity and awareness	biosecurity and equity
			Contraction of the second seco	2b. Fungi	influences vulnerability	Cycles of Life and Death, Ecological Identity	Cultural sensitivity and awareness	biosecurity, human rights, social justice, and equity

		1	Ppaer II: Biodiversity of Archegoneate - Bryophytes, Pteridophytes and Gymnosperm s	1. 1a. Bryophytes	Representatio n, equity	Ecosystem Role,Conservation Efforts, biodiversity	Ecology, sustainability	Diversity, biosecurity
				1b. Pteridophytes	Representatio n, equity	Conservation, climate change	Cultural sensitivity and awareness	Diversity, biosecurity
				2 Gymnosperms	Representatio n, equity	Conservation, climate change , ecosystem services	Cultural sensitivity and awareness	cultural significance, educational value and conservation ethics
1	B.ScI (2018 -19 - 2020- 21)	11	Paper III: Plant Ecology	1. Ecological factors and adaptations 1a.Introduction , Definition and scope of Ecology	Representatio n, equity	Ecosystem function, conservation, climate change	ethical guidelines, sustainable practice	Cultural perspectives, educational goals
				1b. Plant communities and succession	Representatio n, equity	Ecosystem dynamics, conservation implications, climate influence	ethical management, sustainable practice	Cultural perspectives, stewardship, educational goals
								AND ALL CONTROL OF THE PARTY OF

			2. Ecosystem	Representatio	Sustinabilty,	ethical guidelines,	Cultural values,
			and	n, equity	impact	sustainable practice	environmental
			phytogeograph	ii, equity	assessment,		stewardship, public
			y 2a. Ecosystem		assessment,		awarenesss
			2b.	Representatio	Impact of human	ethical guidelines,	Cultural
			Biogeochemical	n, equity	activity,	sustainable practice	perspectives,
			-	n, equity	sustainability,	sustainable practice	stewardship,
			cycle		•		•
-		David N/	4 1	Description	ecosystem health	The second s	educational goals
	II	Paper IV:	1 Introductory	Representatio	Biodiversity,	Ethical claiification.	Cultural
		Plant	Taxonomy,ICBN	n, equity	conservation	Respectful naming	significance,
		Taxonomy	, Botanical		status, impact of		environmental
			garden 1a.		human activities		stewardship,
			Introduction				educational
							outreach
			1b. Herbarium ,	Representatio	Biodiversity,	ethical guidelines,	Cultural
			Botanical	n, equity	conservation	sustainable practice	significance,
			garden		practice, impact of		environmental
					human activities		stewardship, public
							awarenesss
			2b Study of	Representatio	Biodiversity,	ethical guidelines,	Cultural
			angipspermic	n, equity	conservation	sustainable practice	significance,
			families		practice, impact of		environmental
					human activities		stewardship, public
							awarenesss
							SO WEAH AS
							COURT AT MANY

			DATTAJIR	AO KADAM ARTS,	SCIENCE AND CO	MMEREC COLLEGE, I	CHALKARANJI	
				D	EPARTMENT OF	BOTANY		
Deta Value		s Details of	Cross Cutting Iss	sues relevant with (	Gender Awarenes	sss, Environmental Av	varenesss, Professional	Ethics and Human
Sr. No.	Name of the Cours e	Semeste r	Title of paper	Name of the Unit	Details of Cross	Cutting Issues releva	ant with	
					Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
1	B.ScI (2021 -22)	I	Paper I: Microbes, Algae and, Biofertilizers	1. Microbes, 1.1 Viruses	influences vulnerability	spread and evolution, habitat destruction.	Cultural sensitivity and awareness	biosecurity, human rights, social justice, and equity
				1.2. Bacteria	influences vulnerability	spread and evolution, habitat destruction.	Cultural sensitivity and awareness	biosecurity, human rights, social justice, and equity
				2 Algae and Biofertilizer 2.1. Algae	Focus on individual growth	Cycles of Life and Death, Ecological Identity	Cultural sensitivity and awareness	biosecurity and equity
				2.2.Biofertilizer	Equal Access and Participation, Empowermen t Opportunities	eco-friendly alternative, promote sustainable agriculture, mitigate climate change	Cultural sensitivity and awareness	improve human well-being, health, and nutrition

		1	Ppaer II: Cell Biology and Analytical techniques	1. Cell Biology	Inclusive Representatio n,	Sustainable Practices-waste management, energy use, and reduction of hazardous materials.	proper use of biological materials, and ethical treatment of experimental subjects.	Respect for Diversity, Health and Safety
				2. Analytical techniques, 2.1. Microscopy	Inclusive Representatio n and Equal Opportunity	Sustainable Laboratory Practices,Minimizi ng Environmental Impact,Green Technologies	Ethical Use of Samples, Transparency and Replication	Health and Safety,Ethical Considerations in Research
				2.2. Chromatograph y	Inclusive Representatio n and Equal Opportunity	Sustainable Practices,Chemical Management,Gre en Chromatography	Ethical Use of Chemicals,Transpare ncy and Reproducibility	use of personal protective equipment (PPE), proper handling of chemicals, and adherence to safety protocols
1	B.ScI (2021 -22)	11	Paper III: Mycology, Phytopatholo gy and Mushroom cultivation	1. Mycology, 1.1 Fungi	influences vulnerability	Cycles of Life and Death, Ecological Identity	Cultural sensitivity and awareness	biosecurity,human rights, social justice, and equity
			South and the second se	1.2 Lichen	Representatio n, equity	Conservation and Protection, Sustainable Practices	Respect for Ecosystems	Ethical Considerations,ultu ral significance of lichens in various communities

		2.Phytopatholo gy and Mushroom cultivation 2.1 Phytopathology	influences vulnerability	mportance of sustainable agricultural practices and integrated pest management to reduce the environmental impact	honest data collection, accurate reporting	Encourage the responsible communication,
		2.2 Mushroom cultivation	Equal Access and Participation, Empowermen t Opportunities	organic substrates, reducing waste, and managing water use efficiently.	Ethical Treatment of Materials	broader impact of cultivation practices on communities and ecosystems.
11	Paper IV: Archegoneate s (Bryophytes, Pteridophytes and Gymnosperm s)	1 Archegoneate andBryophytes, 1.1 Archegoneate	Representatio n, equity	Ecosystem Role,Conservation Efforts, biodiversity	Ecology, sustainability	Diversity, biosecurity
		1.2 Bryophytes	Representatio n, equity	Ecosystem Role,Conservation Efforts, biodiversity	Ecology, sustainability	Diversity, biosecurity
		2. Pteridophytes and Gymnosperms,	Representatio n, equity	Conservation, climate change	Cultural sensitivity and awareness	Diversity, biosecurity

	2.1 Pteridophytes				
	2.2 Gymnosperms,	Representatio n, equity	Conservation, climate change , ecosystem services	Cultural sensitivity and awareness	cultural significance, educational value and conservation ethics



\$ fe HEAD, (UG & PG) DEPARTMENT OF BOTANY Dattajirao Kadam Arts, Science & Commerce College, Ichalkaranji. -----

			DEPA	RTMENT OF BOTA	NY 2019-2022		
Details of	f Cross Details	of Cros	ss Cutting Issues relevant v		eness,Environmental Aw	vareness, Professio	onal Ethics and Human
		1		Values			
Name of	Title of	Sem	Name of the Unit	Details of Cross	Cutting Issues relevant	with	
the	Paper	•		Gender	Environmental	Professional	Human Values
Course				Awareness	Awareness	Ethics	
B.ScII	Paper V	Ш	1.a Organisation of	Inclusive	Ecological	Accuracy:	Appreciation for
Botany (	Embryolog		Flower.	language: Use	importance:	Ensure precise	nature: Foster
2019-	y of			gender-	Emphasize the crucial	and accurate	appreciation and
2022)	Angiosper			neutral	role of flowers,	descriptions	wonder for the
	ms			language	pollination, and	of flower	complexity and
				when	fertilization in	structure and	beauty of plant
				describing	maintaining	function.	reproductive
				flower	ecosystem balance.	Objectivity:	structures.
				structure and	Conservation:	Approach	Respect for diversity:
				function.	Discuss the impact of	research and	Emphasize the
					environmental	teaching with	importance of plant
				Representatio	changes on plant	objectivity,	diversity and the
				n: Highlight	reproduction and	avoiding bias	impact of human
				contributions	pollinator	and	activities on
				of female	populations.	assumptions.	ecosystems.
			JEAMAGE CO	botanists and			
				scientists in			
			Company and	understanding			
			- CARA	plant			
				reproduction.			
			1.b Pollination and	Equal	Sustainability:	Responsible	Responsible
			Fertilization	opportunities:	Promote sustainable	research:	stewardship:
				Ensure equal	practices in	Conduct	Encourage
				access to	agriculture and	research on	responsible
				education and	horticulture to	plant	stewardship of the
				research	protect pollinators	reproduction	natural world and
				opportunities	and plant diversity.	with	promote sustainable
				in plant		consideration	practices.

		reproductive biology.		for environmental and social implications.	
	2.a Embryo and Endosperm development.	nclusive language: Use gender- neutral language when describing embryonic development and reproductive processes. Representatio n: Highlight contributions of female scientists in understanding	Ecological significance: Emphasize the importance of understanding plant embryology for sustainable agriculture and conservation. Environmental impact: Discuss the impact of environmental factors on plant embryonic development and reproductive success.	Accuracy and precision: Ensure accurate and precise descriptions of embryonic development and reproductive processes. Objectivity: Approach research and teaching with objectivity, avoiding bias and	Curiosity and wonder: Foster curiosity and appreciation for the complex processes of plant embryonic development. Respect for nature: Emphasize the importance of understanding and respecting plant reproductive processes.
		plant embryology and reproduction.		assumptions.	Contraction of the second

			2.b Polyembryony and Apomixis	Equal opportunities: Ensure equal access to education and research opportunities in plant developmenta I biology.	Climate change: Consider the effects of climate change on plant reproduction and development.	Responsible research: Conduct research on plant embryology with consideration for environmental and social implications.	Responsible innovation: Encourage responsible innovation in agriculture and biotechnology, considering ethical implications.
	IENT OF BOTA		Cutting Issues relevant w	l ith Gender Aware	eness,Environmental Awa	areness,Profession	nal Ethics and Human
Values							
Name of	Title of	Sem	Name of the Unit		Cutting Issues relevant	T	
the Course	Paper	•		Gender	Environmental	Professional	Human Values
	5		4 51	Awareness	Awareness	Ethics	• · · · · ·
B.ScII Botany ( 2019- 2022)	Paper VI Plant Physiology		1.a Plant Water Relationship	Inclusive language: Use gender- neutral language when describing plant water relationships and mineral nutrition.	Water conservation: Emphasize the importance of water conservation in agriculture and plant growth. Sustainable practices: Discuss sustainable practices for mineral nutrient management and	Accurate representatio n: Accurately represent plant water relationships and mineral nutrition in research and teaching. Objectivity:	Appreciation for nature: Foster appreciation for the complex relationships between plants, water, and minerals. Responsible stewardship: Encourage responsible stewardship of water

		of female scientists in understanding plant water relations and mineral nutrition.		avoiding bias and assumptions.	
	1.b Mineral Nutrition	Equal opportunities: Ensure equal access to education and research opportunities in plant physiology.	Climate change: Consider the impact of climate change on plant water relationships and mineral nutrition.	Responsible research: Conduct research on plant water relationships and mineral nutrition with consideration for environmental and social implications.	Food security: Emphasize the importance of understanding plant water relationships and mineral nutrition for global food security.

	2.a Photosynthesis	Inclusive	Ecological	Accurate	Appreciation for
		language: Use	significance:	representatio	nature: Foster
		gender-	Emphasize the crucial	n: Accurately	appreciation for the
		neutral	role of plant	represent	complexity and
		language	photosynthesis in	plant	beauty of plant
		when	supporting life on	photosynthesi	growth and
		describing	Earth.	s, growth, and	development.
		plant	Climate change:	development	Responsible
		photosynthesi	Discuss the impact of	in research	stewardship:
		s, growth, and	climate change on	and teaching.	Encourage
		development.	plant growth and	Objectivity:	responsible
		Representatio	development.	Approach	stewardship of plant
		n: Highlight		research and	resources for
		contributions		teaching with	sustainable
		of female		objectivity,	development.
		scientists in		avoiding bias	
		understanding		and	
		plant		assumptions.	
		, photosynthesi			
		s and			
		development.			
	2.b Growth and	Equal	Sustainability:	Responsible	food security:
	Development	opportunities:	Highlight sustainable	research:	Emphasize the
		Ensure equal	practices for plant	Conduct	importance of
	DINDAH 45	access to	growth and	research on	understanding plant
	and and	education and	development, such as	plant	photosynthesis,
		research	reducing waste and	, photosynthesi	growth, and
	THE KIM AND	opportunities	conserving resources.	s, growth, and	development for
		in plant	6	development	global food security.
		biology.		with	<b>J</b>
		07-		consideration	
				for	
				environmental	
				and social	

						implications.	
Details of	f Cross Details	s of Cros	s Cutting Issues relevant	DEPARTMENT OF with Gender Awar Values		vareness, Professi	onal Ethics and Huma
Name of	Title of	Sem	Name of the Unit	Details of Cross	<b>Cutting Issues relevant</b>	with	
the Course	Paper	•		Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
B.ScII Botany ( 2019- 2022)	Paper VII Plant Anatomy	IV	1.a Organization of higher plant body	Inclusive language: Use gender- neutral language when describing plant structure and development. Representatio n: Highlight contributions of female botanists and scientists in understanding plant	Ecological significance: Emphasize the importance of plant structure and function in supporting ecosystems. Sustainability: Discuss sustainable practices for plant growth and development, such as reducing waste and conserving resources.	Accurate representatio n: Accurately represent plant structure and development in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	Appreciation for nature: Foster appreciation for th complexity and beauty of plant structure and development. Responsible stewardship: Encourage responsible stewardship of plan resources for sustainable development.

	1.b Meristematic and Permanent tissue	Equal opportunities: Ensure equal access to education and research opportunities in plant biology.	Conservation: Highlight the impact of human activities on plant diversity and ecosystems.	Responsible research: Conduct research on plant anatomy with consideration for environmental	Curiosity and wonder: Inspire curiosity and wonder about plant biology and its importance in our lives.
				and social implications.	
	2.a Primary and Secondary structure of plant body	Representatio n: Highlight contributions of female botanists and scientists in understanding plant anatomy. Inclusive	Ecological significance: Emphasize the importance of plant structure and function in supporting ecosystems. Sustainability: Discuss sustainable practices for plant	Accurate representatio n: Accurately represent plant structure and development in research and teaching. Objectivity: Approach	Appreciation for nature: Foster appreciation for the complexity and beauty of plant structure and development. Responsible stewardship: Encourage responsible
	A CONTRACTOR	language: Use gender- neutral language when describing plant structure and development.	growth and development, such as reducing waste and conserving resources.	research and teaching with objectivity, avoiding bias and assumptions.	stewardship of plant resources for sustainable development.

			2.b Tissue systems	Equal opportunities: Ensure equal access to education and research opportunities in plant biology.	Conservation: Highlight the impact of human activities on plant diversity and ecosystems.	Responsible research: Conduct research on plant anatomy with consideration for environmental and social implications.	Curiosity and wonder: Inspire curiosity and wonder about plant biology and its importance in our lives.
 	ENT OF BOTA						
Details of Values	Cross Details	of Cross	Cutting Issues relevant	with Gender Aware	eness,Environmental Awa	areness, Professio	nal Ethics and Human
Name of	Title of	Sem	Name of the Unit	Details of Cross	Cutting Issues relevant	with	
the	Paper	•		Gender	Environmental	Professional	Human Values
Course				Awareness	Awareness	Ethics	
B.ScII Botany ( 2019- 2022)	Paper VIII Plant Metabolis m	IV	1.a Enzymes	Inclusive language: Use gender- neutral language when describing plant water	Water conservation: Emphasize the importance of water conservation in agriculture and plant growth. Sustainable practices: Discuss	Accurate representatio n: Accurately represent plant water relationships and mineral nutrition in	Appreciation for nature: Foster appreciation for the complex relationships between plants, water, and minerals. Responsible stewardship:

		understanding plant water relations and mineral nutrition.		assumptions.	
	1.b Nitrogen Metabolism	Equal opportunities: Ensure equal access to education and research opportunities in plant physiology.	Climate change: Consider the impact of climate change on plant water relationships and mineral nutrition.	Responsible research: Conduct research on plant water relationships and mineral nutrition with consideration for environmental and social implications.	Food security: Emphasize the importance of understanding plant water relationships and mineral nutrition for global food security.
	2.a Respiration	Inclusive language: Use gender- neutral language when describing enzymes and nitrogen metabolism.	Ecological significance: Emphasize the importance of enzymes and nitrogen metabolism in ecosystem balance. Conservation: Highlight the impact of human activities on nitrogen cycles	Accurate representatio n: Accurately represent enzyme function and nitrogen metabolism in research and teaching. Objectivity:	Appreciation for nature: Foster appreciation for the complexity of enzyme function and nitrogen metabolism. Responsible stewardship: Encourage responsible stewardship of

	Representatio n: Highlight contributions of female scientists in understanding enzyme function and nitrogen metabolism.	and ecosystems.	Approach research and teaching with objectivity, avoiding bias and assumptions.	nitrogen resources for sustainable development.
2.b Seed Dormancy and Germination	Equal opportunities: Ensure equal access to education and research opportunities in biochemistry.	Sustainability: Discuss sustainable practices for nitrogen management and enzyme use.	Responsible research: Conduct research on enzymes and nitrogen metabolism with consideration for environmental and social implications.	Curiosity and wonder: Inspire curiosity and wonder about biochemical processes and their importance in life.



	DATTAJIRAO KADAM ARTS, SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI										
				DEPARTMEN	T OF Botany (B.Sc. III	) 2018-2023					
D	Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values										
Sr.	Nam	Title of	Se	Name of the Unit	Details of Cross Cut	ting Issues relevan	t with				
Ν	e of	Paper	m.		Gender	Environmental	<b>Professional Ethics</b>	Human Values			
о.	the				Awareness	Awareness					
	Cour se										
1	B.Sc. III (202 0- 2023 )	DSE –E25 Genetics and Plant Breeding		Unit 1: Mendelism:	understand sex- specific diseases and disorder; develop gender- tailored medical tretment; enhances our understanding of gender identity and expression	To understand of How enviormnetal factor interact with Mendial genetics to shape plant growth development and adaptions	Aplication of mendelian genetics in various , including research, medicine, agriclture and biotechnology these ethics- environmental responsibilty, respect for person; justics, autonomy, confidentiality	Respect for human life; Improvemnet of human and plant life; relif of suffering; Mendelian gentics to improves human life and society, while minimizing potenital risks and harms			

	1						· · · · · · · · · · · · · · · · · · ·
			Unit 2 : Linkage and	genetic process	Linkage:		Linkage and
			Recombination	differ between	Enviormental	- Address complex	recombination
				males and feamles	stress can	issues with	are terms
				particular in	incresae or	multifaceted ethical	typically used in
				relation to sex	decrease	approaches	genetics to
				chromsomes;	recombition	- Promote	describe the
				develop gender-	rates, affecting	consistency and	physical
				tailored genetic	genetic	coherence in	connection
				counseling and	diversity,	professional ethics	between genes
				testing;improve	temapture	- Encourage	ona
				crop breeding	radiation and	ongoing refinement	chromosome
				program; traides	chemical	and evolution of	and the shuffling
1				differences and	exposure can	ethical principle	of genetic
				their behavior.	alter		material during
					recombination		reproduction.
					frequency and		However, if we
					disrtibution		interpret your
							question more
							broadly, we can
							explore the
							connection and
							recombination of
							human ethics in
							various contexts.
			Unit 3: Chromosomes	gender identity	enviornmanetal	Confidentiality and	Chromosomes,
			structure	exists beyond the	factor impact	privacy; Informed	the thread-like
			and	<pre>binary male/</pre>	the structure,	consent; Accurate	structures within
1			Variation	female; Gender	function and	interpretation and	our cells, carry
				expression and	organization of	counseling;	genetic
			1 Day of the	identity can vary	chromosomes	Transparency and	information that
				widely; respecting	genes and	accountability;	shapes who we
				and affirming	genome	Continuing	are. Variations in
				indiviuals self	Schonic	education and	chromosomes
				iddentifed gender		training	can lead to
				iddentifed gelider		training	

	is essential			differences in traits, susceptibility to diseases, and even influence behavior. Here's how chromosome structure and
Unit 4: Plant Breeding	understanding plant sexgender; gender specific traits; promoting gender quality; social and cultural implication	Develop climate -resilient crop; improve resources use efficiency; enhances ecosystem services; conserve genetic diversity	Transparency and open communication; Responsible innovation; Intellectual property and ownership; Environmental stewardship	variation relate to human ethics: Prioritize transparency, inclusivity, and public engagement.; Consider diverse perspectives and values in breeding decisions.; . Implement equitable access and benefit- Monitor and mitigate potential negative consequences.sh aring mechanisms.

2	B.Sc. III (202 0- 2023 )	Paper- XDSE –E26 Microbiolo gy, Plant Pathology and Mushroom Culture Technology	V	Unit 1: Microbiology	Diversity in the lab: Inclusive language and practices; Research focus and applications; Role models and mentorship; Addressing biases and barriers:; Gender-sensitive research methods:	Education and outreach; Water quality and management; Agroecology and sustainable agriculture; Microplastics and pollution; Environmental monitoring; Pollution and remediation	<ol> <li>Responsible research practices</li> <li>Biosafety and biosecurity:</li> <li>Informed consent:</li> <li>Confidentiality and data protection:</li> </ol>	1. Vaccine development and distribution 2. Infection control and public health 3. Antimicrobial resistance and stewardship; 4. Microbiome research and manipulation; 5.Synthetic biology and bioengineering; 6. Biodefense and dual-use research
								bioengineering; 6. Biodefense
								research
				A CONTRACT OF CONTRACT				

		Unit 2: Industrial	Diversity in the	Education and	1. Responsible	1. Vaccine
			lab: Inclusive		•	
		Microbiology		outreach;	research practices	development
			language and	Water quality		and distribution
			practices;	and	2. Biosafety and	2. Infection
			Research focus	management;	biosecurity:	control and
			and applications;	Agroecology		public health 3.
			Role models and	and sustainable	3. Informed	Antimicrobial
			mentorship;	agriculture;	consent:	resistance and
			Addressing biases	Microplastics		stewardship; 4.
			and barriers:;	and pollution;	4. Confidentiality	Microbiome
			Gender-sensitive	Environmental	and data	research and
			research methods:	monitoring;	protection:	manipulation;
				Pollution and		5.Synthetic
				remediation		biology and
						bioengineering;
						6. Biodefense
						and dual-use
						research
		Unit 3: Plant Pathology	Diverse	Climate and	Overview of ethical	Incorporating
			Representation	Weather, Soil	principles and their	human values
				Health,	importance in	into plant
				Topography and	scientific research	pathology
				Microclimates	and practice.	emphasizes the
					Key ethical values:	ethical and social
					, honesty, integrity,	dimensions of
					responsibility, and	research and
					fairness.	practice,
					Ethical Standards	ensuring that
					and Guidelines	scientific
		30 WDAN ASC				activities
		(3()))))))))))))))))))))))))))))))))))				contribute
		Barris Contraction				positively to
1						society and
1						respect
L						respect

				fundamental principles
Unit 4: Mushroom Technology	Representation in Research, Inclusivity in Education and Outreach, Technology and Accessibility, Ethical Considerations	Bioremediation, Waste Management, Sustainable Materials, Carbon Sequestration, Soil Health and Agriculture	Environmental Responsibility, Safety and Health, Transparency and Honesty, Respect for Biodiversity, Intellectual Property and Collaboration, Regulatory Compliance	Sustainability, Health and Safety, Innovation and Progress, Integrity and Honesty, Respect for Nature, Social Responsibility, Empathy and Compassion

2	D Co	Dener VI	N	Linit 1. Coll on a unit of life	This is shout	Callular	Into guite cond	Dielegieal
3	B.Sc.	Paper- XI	V	Unit 1: Cell as a unit of life	This is about	Cellular	Integrity and	Biological
		DSE –E27			ensuring that	Homeostasis,	Honesty, Respect	Significance,
	(202	Cytology			people of all	Signal	for Life,	Health and
	0-	and			genders have	Transduction,	Confidentiality,	Disease,
	2023	Research			equal rights,	Adaptation and	Compliance with	Philosophical and
	)	Techniques			responsibilities,	Evolution,	Regulations, Ethical	Ethical
		in Biology			and opportunities.	Environmental	Use of Resources,	Implications,
					It involves	Impact on	Education and	Human Dignity,
					addressing and	Cellular	Mentorship, Public	Interconnectedn
					challenging	Function,	Engagement	ess and Unity
					stereotypes,	Biomonitoring		
					discrimination,	and		
					and inequities.	Environmental		
						Indicators		
				Unit 2: Cell Organelles	Awareness:	Pollution and	Human and Animal	Nucleus -
					Increasing	Toxins, Climate	Welfare, Consent	Leadership and
					knowledge about	Change,	and Privacy,	Vision,
					gender diversity	Radiation,	Research Integrity,	Mitochondria -
					and challenging	Heavy Metals	Gene Editing and	Energy and
					stereotypes.	and Chemical	Synthetic Biology,	Resilience,
						Exposure,	Clinical	Endoplasmic
						Nutrient	Applications,	Reticulum (ER) -
						Deficiencies,	Education and	Collaboration
							Training	and
							, , , , , , , , , , , , , , , , , , ,	Communication,
								Vacuoles -
								Reflection and
								Contentment,
								Cytoskeleton -
						Some Asco		Stability and
								Support,
						TOWNER AND		Peroxisomes -
						$\sim$		Responsibility
								and Care
	I		<u> </u>					

Unit 3: Sub Cellular Structures and Cell Membrane	Advocacy: Promoting policies and practices that support gender inclusivity and address gender- based discrimination.	Pollution and Toxins, Climate Change, Radiation, Heavy Metals and Chemical Exposure, Nutrient Deficiencies,	Research Integrity, Accuracy and Honesty, Responsible Conduct in Research, Ethical Treatment of Biological Materials, Ethical Implications of Biotechnological Applications, Education and	Respect for Life, Human Dignity, Animal Welfare, Integrity and Honesty, Responsibility and Accountability, Compassion and Empathy, Respect for Diversity,
Unit 4: Research	Both research	Field Surveys	Training Research Integrity,	Education and Knowledge Sharing Ethical
Techniques in Biology	techniques in biology and gender awareness involve methods and approaches for gathering and analyzing information, but they are applied in very different contexts.	and Observations, Remote Sensing, Ecological Modeling, Genetic Analysis, Bioinformatics, Experimental Manipulations, Long-term Ecological	Accuracy and Honesty, Responsible Conduct in Research, Ethical Treatment of Biological Materials, Ethical Implications of Biotechnological Applications, Education and Training	Considerations in Research, Human Values Reflected in Research Techniques, Social Responsibility and Public Engagement, Technological and Methodological
Concourse .		Research		Considerations, Education and Training

4	B.Sc.	Paper- XII	V	Unit 1: Importance and	Diverse	Field Surveys	Research Integrity,	Ethical
	Ш	DSE–E28		divisions of Horticulture	Perspectives and	and	Accuracy and	Considerations in
	(202	Horticultur			Innovations,	Observations,	Honesty,	Research,
	0-	e and			Equitable	Remote	Responsible	Human Values
	2023	Gardening			Opportunities,	Sensing,	Conduct in	Reflected in
	)	U			Addressing	Ecological	Research, Ethical	Research
					Historical	Modeling,	Treatment of	Techniques,
					Imbalances,	Genetic	Biological Materials,	Social
					Improved	Analysis,	Ethical Implications	Responsibility
					Collaboration and	Bioinformatics,	of Biotechnological	and Public
					Productivity,	Experimental	Applications,	Engagement,
					Educational	Manipulations,	Education and	Technological
					Access, Career	Long-term	Training	and
					Opportunities,	Ecological	Ũ	Methodological
					Research and	Research		Considerations,
					Development,			Education and
					Workplace			Training
					Culture, Consumer			C
					Perspectives,			
					Policy and			
					Advocacy			
				Unit 2: Horticultural	Diverse	Sustainable	Sustainable	Respect for
				Produce and Management	Perspectives and	Practices,	Practices, Safety	Nature,
				of Pest and diseases	Innovations,	Water	and Health, Honesty	Commitment to
					Equitable	Conservation,	and Integrity,	Sustainability,
					Opportunities,	Biodiversity,	Professional	Ethical
					Addressing	Waste	Competence,	Responsibility,
					Historical	Reductio,	Continuous	Empathy and
					Imbalances,	Climate Change	Learning, Skill	Compassion,
				UNRAL .	Improved	Mitigation,	Development,	Education and
				AND AND ALCE	Collaboration and	Education and	Respect for Clients	Knowledge
					Productivity,	Advocacy, Soil	and Communities,	Sharing
				COMPLETING AND	Educational	Health	Ethical Plant	
					Access, Career		Sourcing	

	Opportunities, Research and Development, Workplace Culture, Consumer Perspectives, Policy and Advocacy			
Unit 3: Nursery	rowing and consuming fresh produce can improve health and well-being. Gardening is also associated with psychological benefits, including stress relief and increased physical activity.	Nature Exploration, Gardening Projects, Recycling and Waste Management, Environmental Books, Sustainable Practices, Eco- Friendly Product, Art and Expression	Environmental Responsibility, Honesty and Transparency, Customer Respect and Service, Integrity in Business Practices, Compliance with Regulations	Sustainability, Health and Safety, Innovation and Progress, Integrity and Honesty, Respect for Nature, Social Responsibility, Empathy and Compassion

				Unit 4: Landscape	Landscape	Native Plants,	Environmental	Sustainability,
				Gardening	gardening involves	Water	Responsibility,	Health and
				0	the design,	Conservation,	Honesty and	Safety,
					installation, and	Soil Health,	, Transparency,	Innovation and
					maintenance of	Biodiversity,	Customer Respect	Progress,
					outdoor spaces to	Sustainable	and Service,	Integrity and
					enhance their	Design, Waste	Integrity in Business	Honesty, Respect
					aesthetic,	Reduction,	Practices,	for Nature, Social
					functional, and	Education and	Compliance with	Responsibility,
					ecological	Community	Regulations	Empathy and
					qualities. It blends	Engagement		Compassion
					art and science to			
					create			
					environments that			
					are both beautiful			
					and practical.			
5	B.Sc.	Paper- XIII	VI	Unit 1: Carbohydrates	Carbohydrates are	Agricultural	Nutrition and	Human Rights,
	Ш	DSE –F25			essential	Practices,	Dietary Advice,	Research Ethics,
	(202	Plant			macronutrients	Climate	Food Industry	Cultural
	0-	Biochemistr			that serve as a	Change,Greenh	Practices,	Sensitivity,
	2023	y and			major source of	ouse Gas	Agricultural Ethics,	Agricultural and
	)	Molecular		S MILAN AS	energy for the	Emissions,	Public Health,	Environmental
		Biology		E E	body. They are	Sustainable	Research Integrity,	Impact
				( and a set	made up of	Practices, Food	Patient	
				The second se	carbon, hydrogen,	Choices, Dietary	Confidentiality	
					and oxygen	Shifts,		

Unit 2 : Lipids	Lipids are a diverse group of organic compounds that are insoluble in water but soluble in organic solvents. They play several crucial roles in biological systems	Pollution and Contamination, Biodegradation, Biodiversity and Ecosystems, Climate Change, Sustainable Practices	Integrity in Research, Responsible Application, Environmental Impact, Animal Welfare	Health and Well- being, Sustainability, Equity and Accessibility, Scientific Integrity, Cultural Sensitivity
Unit 3: Proteins	Proteins are essential macromolecules made up of amino acids. They play numerous vital roles in the body, including structural, functional, and regulatory functions.	Resource Efficiency, Greenhouse Gas Emissions, Land Use and Deforestation, Water Consumption, Waste and Pollution,	Scientific Integrity, Respect for Human and Animal Subjects, Privacy and Confidentiality, Ethical Use of Genetic Information,	Human Health and Safety, Animal Welfare, Environmental Impact, Equity and Access, Education and Communication, Professional Conduct
Unit 4: Nucleic Acids	Nucleic acids are fundamental biomolecules essential for storing and transferring genetic information. There are two main types: DNA (deoxyribonucleic	Biodiversity Monitoring, Pollution Detection and Management, Genetically Engineered Organisms, Microbial Bioremediation, Gene	Scientific Integrity, Respect for Human and Animal Subjects, Privacy and Confidentiality, Ethical Use of Genetic Information,	Respect for Life, Human Dignity, Animal Welfare, Integrity and Honesty, Responsibility and Accountability, Compassion and Empathy, Respect for

					acid) and RNA (ribonucleic acid).	Expression Studies, Genetic Adaptation, Genetic Diversity		Diversity, Education and Knowledge Sharing
6	B.Sc. III (202 0- 2023 )	Paper- XIV DSE –F26 Bioinformat ics, Biostatistics and Economic Botany	VI	Unit 1: Bioinformatics	Bioinformatics is the interdisciplinary field that combines biology, computer science, and information technology to analyze and interpret biological data. It plays a crucial role in understanding complex biological processes and advancing personalized medicine.	Biodiversity Monitoring, Pollution Detection and Management, Genetically Engineered Organisms, Microbial Bioremediation, Gene Expression Studies, Genetic Adaptation, Genetic Diversity, Environmental DNA (eDNA), Climate Change Impact, Pollution Effects, Ecosystem Function and Health,	Scientific Integrity, Respect for Human and Animal Subjects, Privacy and Confidentiality, Ethical Use of Genetic Information,	Respect for Privacy, Equity and Fairness, Integrity and Honesty, Beneficence and Non- Maleficence, Positive Impact, Commitment to Social Responsibility, Collaboration and Respect

				Conservation Genomics		
		Unit 2: Biostatistic	Biostatistics involves the application of statistical methods to biological, medical, and health-related research. It is crucial for designing experiments, analyzing data, and drawing valid conclusions from scientific studies.	Data Collection and Analysis, Risk Assessment, Monitoring and Evaluation, Predictive Modeling, Communicating Results, Supporting Research	Integrity and Honesty, Respect for Life, Confidentiality, Compliance with Regulations, Ethical Use of Resources, Education and Mentorship, Public Engagement	Accountability, Transparency and Accountability, Open Communication, Ongoing Improvement, Transparency and Accountability, Prevention of Harm
						AND ALCONTRACT

	Unit 4: Economic Botany:	Economic Botany	Sustainable	Respect for	Sustaining
	Spices, Beverages and	is the study of	Practices,	Indigenous	Livelihoods,
	Fibers	plants that are of	Water	Knowledge and	Health and
		economic	Conservation,	Rights, Sustainable	Medicine, Food
		importance to	Biodiversity,	Practices,	Security,
		humans. This	Waste	Transparency and	Economic
		includes their use	Reductio,	Honesty,	Development,
		as spices,	Climate Change	Intellectual	Educational and
		beverages, and	Mitigation,	Property Rights,	Scientific
		fibers. Gender	Education and	Ethical Research	Advancements
		awareness in this	Advocacy, Soil	Practices	
		context involves	Health,		
		understanding	Conservation		
		how gender	Efforts, Climate		
		influences and is	Change		
		influenced by the	Adaptation,		
		production,	Bioprospecting		
		distribution, and			
		consumption of			
		these plant-based			
		resources.			
	Unit 4: Economic Botany:	Economic Botany	Sustainable	Respect for	Sustaining
	Spices, Beverages and	is the study of	Practices,	Indigenous	Livelihoods,
	Fibers	plants that are of	Water	Knowledge and	Health and
		economic	Conservation,	Rights, Sustainable	Medicine, Food
		importance to	Biodiversity,	Practices,	Security,
		humans. This	Waste	Transparency and	Economic
		includes their use	Reductio,	Honesty,	Development,
		as spices,	Climate Change	Intellectual	Educational and
	VADAU.	beverages, and	Mitigation,	Property Rights,	Scientific
	A CALLER	fibers. Gender	Education and	Ethical Research	Advancements
		awareness in this	Advocacy, Soil	Practices	
	CHARLANNERS ST	context involves	Health,		
		understanding	Conservation		

					how gender influences and is influenced by the production, distribution, and consumption of these plant-based resources.	Efforts, Climate Change Adaptation, Bioprospecting		
7	B.Sc. III (202 0- 2023 )	Paper- XV DSE –F27 Plant Biotechnol ogy and Paleobotan Y	VI	Unit 1: Plant Biotechnology	ant Biotechnology and gender awareness intersect in various ways, particularly in how technology impacts agricultural practices, research opportunities, and economic benefits.	Genetically Modified Crops, Bioremediation, Conservation of Biodiversity, Climate Change Mitigation, Sustainable Agriculture	Environmental Impact, Food Safety and Nutrition, Socioeconomic Considerations, Ethical Research Practices, Animal Welfare, Public Engagement and Education	Ethical Responsibility, Sustainability, Equity and Access, Cultural Sensitivity, Transparency and Public Engagement
				Unit 2: Recombinant DNA Technology	Recombinant DNA Technology and gender awareness intersect in important ways, especially in the contexts of research, biotechnology applications, and	Bioremediation, Protecting Endangered Species, Genetic Resilience, Research and Collaboration, Regulation and Monitoring, Ecological	Safety and Risk Management, Informed Consent, Professional Integrity, Compliance with Regulations, Equity and Access	Respect for Human Dignity, Beneficence and Non- Maleficence, Justice and Fairness

Unit 3: Plant Tissue Culture	policy development. 1. Inclusive research teams; 2.Gender-sensitive research design 3. Empowering women farmers: 4. Addressing gender disparities5. Gender-aware extension services 6.Inclusive language and communication 7.	Impact, Public Engagement Ingagement Ingagement Ingagement energy sources 2. Implementing waste reduction and recycling strategies 3. Developing resource- efficient systems; 4. Ensuring proper	Responsible research practices: 2.Proper citation and credit 3. Intellectual property respect 4. Biosafety and biosecurity 5. Informed consent 6. Confidentiality and data protection 7.Collaboration and mentorship	1. Sustainability; 2. Food security; 3. Health and wellness; 4. Environmental stewardship; 5. Economic growth; 6. Cultural preservation 7. Education and innovation 8. Equity and
A STATE OF THE STA	communication 7. Supporting women in STEM	Ensuring proper containment and management of plant species; 5. Promoting sustainable agriculture practices	mentorship	Equity and access 9. Global cooperation

				Unit 4: Paleobotany	Highlighting Contributions, Encouraging Diversity, Addressing Bias, Supporting Networks	Climate Reconstruction, Ecosystem Changes, Biodiversity Insights, Carbon Cycle Studies	Integrity in Research, Respect for Fossil Sites, Cultural Sensitivity, Environmental Responsibility,	Exploring Ancient Plant-Based Medicines, Conserving Biodiversity, Paleoclimatology and Public Health
8	B.Sc. III (202 0- 2023 )	Paper- XVI DSE –F28 Bio fertilizers and Herbal Drug Technology	VI	Unit 1: Biofertilizers	Access and Participation, Training and Education, Impact Assessment, Policy and Support	Reduction in Chemical Inputs, Enhanced Soil Health, Decreased Greenhouse Gas Emissions, Support for Biodiversity, Sustainable Farming Practices	Patient Safety and Well-being, Confidentiality and Privacy,Professional Competence, Honesty and Integrity	Compassion, Respect, Integrity, Responsibility, Equity, Education
				Unit 2: Herbal Medicines	Different Health Needs, Historical and Cultural Context, Access and Use,Research and Representation, Psychosocial Factors	Sustainable Sourcing, Biodiversity Conservation, Organic Farming, Climate Change Impact, Waste Reduction	Patient Safety and Well-being, Informed Consent, Competence and Continuous Learning,Confidenti ality, Integrity and Honesty	Holistic Care, Respect for Nature, Cultural Heritage and Tradition, Empowerment and Autonomy, Compassion and Empathy,

		Unit 3: Herbal cosmetology	Being mindful of	Ethical	Ingredient	The sourcing of
			the diverse	Harvesting:	Disclosure: Clearly	herbal
			experiences and	Ensure that	list all ingredients	ingredients
			identities within	herbs and	used in products,	should be done
			the community.	plants are	including any	ethically. This
			This includes	harvested in a	potential allergens	includes ensuring
			acknowledging	way that	or harmful	that plants are
			non-binary and	maintains	substances.	harvested
			gender non-	ecological	Transparency helps	sustainably and
			conforming	balance. This	consumers make	that the
			individuals in both	includes	informed choices	practices do not
			product	avoiding	and builds trust.	harm the
			development and	overharvesting	Marketing Claims:	environment or
			marketing.	and using	Avoid misleading or	deplete local
				methods that	exaggerated claims	resources. Fair
				do not damage	about the benefits	trade principles
				natural	of herbal products.	and respect for
				habitats.	Provide accurate	indigenous
					information based	knowledge and
					on scientific	rights are also
					evidence and	crucial, ensuring
					regulatory	that local
					standards.	communities
						benefit from the
						use of their
						traditional
						plants.
						P
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				End to all	1	The second second
		Unit 4: Herbal cosmetology	Being mindful of	Ethical	Ingredient	The sourcing of
			the diverse	Harvesting:	Disclosure: Clearly	herbal
			experiences and	Ensure that	list all ingredients	ingredients
			identities within	herbs and	used in products,	should be done
			the community.	plants are	including any	ethically. This
			This includes	harvested in a	potential allergens	includes ensuring
			acknowledging	way that	or harmful	that plants are
			non-binary and	maintains	substances.	harvested
			gender non-	ecological	Transparency helps	sustainably and
			conforming	balance. This	consumers make	that the
			individuals in both	includes	informed choices	practices do not
			product	avoiding	and builds trust.	, harm the
			development and	overharvesting	Marketing Claims:	environment or
			marketing.	and using	Avoid misleading or	deplete local
				methods that	exaggerated claims	resources. Fair
				do not damage	about the benefits	trade principles
				natural	of herbal products.	and respect for
				habitats.	Provide accurate	indigenous
				nabitats.	information based	knowledge and
					on scientific	rights are also
					evidence and	crucial, ensuring
					regulatory	that local
					<b>v</b> ,	
					standards.	communities
						benefit from the
						use of their
						traditional
						plants.
			Superior Contraction			

9	B.Sc.	Paper- XI	V	Unit 1: Algae	Gender awareness	Algae, which	In the context of	Igae, such as
5	в.эс. III	Biology of	v	UTIL I. Algae	means recognizing	includes a	algae use within	spirulina and
	(201	Non			that people of all	diverse range of	industries such as	chlorella, are rich
	8-	Vascular			genders use	photosynthetic	cosmetics,	in nutrients and
	2020	plants and			skincare and	organisms such	nutrition, and	have been
	2020	paleobotan				-		
	)	•			wellness products.	as microalgae and	pharmaceuticals,	recognized for their health
		У			Algae-based		professional ethics	
					products should	macroalgae,	involves adhering to	benefits. They
					be formulated and	plays a crucial	principles that	are a source of
					marketed in a way	role in	ensure responsible,	protein,
					that is inclusive	environmental	transparent, and	vitamins, and
					and respectful of	sustainability	respectful practices.	essential fatty
					all identities.	and has		acids. Their use
						significant		in dietary
						potential in		supplements and
						various		functional foods
						industries,		supports values
						including		related to health
						cosmetics,		and well-being
						nutrition, and		by providing
						biofuels.		nutritious
								options and
								promoting
								healthier
								lifestyles.
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							COMPLETE STATE	

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mushrooms and mushrooms and especially those in ci	and a local state of the second state of the s
	crucial role in
	ecosystems by
	decomposing
	organic matter,
	recycling
	nutrients, and
cosmetic benefits. opportunities and respect the role for	orming
When integratingforof fungi insy	symbiotic
fungi into skincare sustainability. ecosystems. Fungi re	relationships
and wellness Their role in are crucial for w	with plants. This
products, gender ecosystems and nutrient cycling, soil su	supports values
awareness their potential health, and re	elated to
	environmental
	conservation and
	sustainability.
	Protecting fungal
	nabitats and
	ensuring
	sustainable
	practices in the
	collection and
	use of fungi are
	vital for
	maintaining
	ecological
b	palance.
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		Unit 3: Bryophytes	Bryophytes,	Bryophytes,	Bryophytes are	Bryophytes are
		, , ,	including mosses,	which include	often indicators of	crucial for
			liverworts, and	mosses,	environmental	maintaining
			hornworts, are	liverworts, and	health and can be	ecological
			non-vascular	hornworts, are	sensitive to habitat	balance. They
			plants that are	small but	changes.	help in soil
			' gaining attention	ecologically	Professionals	formation,
			for their ecological	significant	involved in land	moisture
			benefits and	plants that play	management,	retention, and as
			potential	an essential role	conservation, and	indicators of
			applications in	in various	environmental	environmental
			skincare and	environmental	impact assessments	health.
			wellness.	processes. Their	need to approach	Protecting
			Integrating	' incorporation	their work with a	bryophyte
			bryophytes into	into practices	strong ethical	habitats supports
			these fields with	and products	commitment to	values related to
			gender awareness	with	preserving	environmental
			involves ensuring	environmental	bryophyte habitats.	conservation and
			inclusivity and	awareness		sustainability.
			sensitivity to	involves		Their sensitivity
			diverse gender	recognizing		to environmental
			identities and	their ecological		changes makes
			expressions.	benefits and		them valuable
				promoting		for monitoring
				sustainable use		ecosystem
						health and
						assessing the
						impacts of
						climate change.
					and the second second	

10	B.Sc. III (201 8- 2020 )	Paper- X Genetics and Analytical Techniques in plant science.	V	Unit 4: Paleobotany Unit 1: Sex Chromosomes, Determination and Population Genetices	Highlighting Contributions, Encouraging Diversity, Addressing Bias, Supporting Networks, understand sex- specific diseases and disorder; develop gender- tailored medical tretment; enhances our understanding of gender identity and expression	Climate Reconstruction, Ecosystem Changes, Biodiversity Insights, Carbon Cycle Studies To understand of How enviormnetal factor interact with Mendial genetics to shape plant growth development and adaptions	Integrity in Research, Respect for Fossil Sites, Cultural Sensitivity, Environmental Responsibility, Aplication of mendelian genetics in various, including research, medicine, agriclture and biotechnology these ethics- environmental responsibilty, respect for person; justics, autonomy, confidentiality	Exploring Ancient Plant-Based Medicines, Conserving Biodiversity, Paleoclimatology and Public Health Respect for human life; Improvemnet of human and plant life; relif of suffering; Mendelian gentics to improves human life and society, while minimizing potenital risks and harms
				Unit 2: Chromosomal Interitance	genetic process differ between males and feamles particular in relation to sex chromsomes; develop gender- tailored genetic counseling and testing;improve crop breeding program; traides	Linkage: Enviormental stress can incresae or decrease recombition rates, affecting genetic diversity, temapture radiation and chemical	<ul> <li>Address complex issues with multifaceted ethical approaches</li> <li>Promote consistency and coherence in professional ethics</li> <li>Encourage ongoing refinement and evolution of</li> </ul>	Linkage and recombination are terms typically used in genetics to describe the physical connection between genes on a chromosome and the shuffling

		differences and their behavior.	exposure can alter	ethical principle	of genetic material during
			recombination		reproduction. However, if we
			frequency and disrtibution		interpret your
					question more
					broadly, we can
					explore the
					connection and
					recombination of
					human ethics in
					various contexts.
	Unit 3: Variation in	gender identity	enviornmanetal	Confidentiality and	Chromosomes,
	chromosomes number and	exists beyond the	factor impact	privacy; Informed	the thread-like
	structure	binary male/	the structure,	consent; Accurate	structures within
		female; Gender	function and	interpretation and	our cells, carry
		expression and	organization of	counseling;	genetic
		identity can vary	chromosomes	Transparency and	information that
		widely; respecting	genes and	accountability;	shapes who we
		and affirming	genome	Continuing	are. Variations in
		indiviuals self		education and	chromosomes
		iddentifed gender		training	can lead to
		is essential			differences in
	SHIDAWAS				traits,
					susceptibility to
	C. C. S.				diseases, and even influence
	TEXAN AND				behavior. Here's
					how
					chromosome
					structure and
					variation relate
					to human ethics:

	Unit 4: Analytical				
	techniques in plant science	Analytical techniques in plant	Sustainable Laboratory	Ethical Use of Samples,	Health and Safety,Ethical
	techniques in plant science	science are	Practices, Minim	Transparency and	Considerations in
		methods used to	•	Replication	Research
			izing	Replication	Research
		study plant	Environmental		
		structures,	Impact,Green		
		functions, and	Technologies		
		processes. These			
		techniques are			
		essential for			
		understanding			
		plant biology,			
		improving crop			
	ushaw.	performance, and			
	and the second	addressing			
		agricultural			
	Contraction of the	challenges.			
11 B.Sc. Paper- XI V	Unit 1: Mineral Nutrition	Mineral Nutrition	Essential	Integrity in	Responsibility,
III Fundament	and Nitrogen Metabolisum	and Nitrogen	Nutrients, Soil	Recommendations	Environmental
(201 al of Plant	6	Metabolism in	Health,	and Practices,	Stewardship,
8- Physiology		plants, when	Fertilization,	Environmental	Integrity,
2020 and		viewed through	Environmental	Responsibility,	Honesty in
) Ecology		the lens of gender	Impact, Soil	Public Health	Practices,
, 200108,		awareness,	Degradation,	Considerations,	Respect for
		intersect in	Atmospheric	Ethical Research	Nature,
		important ways,	Nitrogen	and	Biodiversity
		particularly in	Fixation,	DevelopmentProfes	Protection,
		agricultural	Nitrogen Use	sional Competence,	Accountability,
		research, crop	Efficiency	sional competence,	Empathy,
	- ABDAM	management, and			Linpatity,
	A CE	policy			
		development.			
	Court King to 3				

		Unit 2: Photosynthesis and	Inclusive language:	Ecological	Accurate	Appreciation for
		Respiration	Use gender-	significance:	representation:	nature: Foster
		Respiration	neutral language	Emphasize the	Accurately	appreciation for
			when describing	crucial role of	,	the complexity
			-		represent plant	· · ·
			plant	plant	photosynthesis,	and beauty of
			photosynthesis,	photosynthesis	growth, and	plant growth and
			growth, and	in supporting	development in	development.
			development.;	life on Earth.;	research and	Responsible
			Inclusive language:	Ecological	teaching.	stewardship:
			Use gender-	significance:	Objectivity:	Encourage
			neutral language	Emphasize the	Approach research	responsible
			when describing	importance of	and teaching with	stewardship of
			enzymes and	enzymes and	objectivity, avoiding	plant resources
			nitrogen	nitrogen	bias and	for sustainable
			metabolism.	metabolism in	assumptions.;	development.;
			Representation:	ecosystem	Accurate	Appreciation for
			Highlight	balance.	representation:	nature: Foster
			contributions of	Conservation:	Accurately	appreciation for
			female scientists in	Highlight the	represent enzyme	the complexity of
			understanding	impact of	function and	enzyme function
			enzyme function	human	nitrogen	and nitrogen
			and nitrogen	activities on	metabolism in	metabolism.
			metabolism.	nitrogen cycles	research and	Responsible
			Representation:	and	teaching.	stewardship:
			Highlight	ecosystems.	Objectivity:	Encourage
			contributions of		Approach research	responsible
			female scientists in		and teaching with	stewardship of
			understanding		objectivity, avoiding	nitrogen
		~	plant		bias and assumpt	resources for
		STA LADAN ASC	photosynthesis			sustainable
		(氰( )萬)	and development.			development.
		- Charles and -				
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			Unit 3: Population ecology	Fostering inclusive	Respect for	Objectivity and	Climate change
				communication;	non-human	rigor; Transparency	mitigation and
				Supporting	life:;	and reproducibility;	adaptation;
				indigenous	Precautionary	Responsible data	Economic
				women's	principle;	management;	benefits and
				knowledge;	Sustainability	Collaboration and	resource
				Challenging	and	communication	valuation;
				gender	conservation;		Human-wildlife
				stereotypes;	Ecological		conflict
				Community	integrity;		mitigation;
				engagement and			Human health
				participation			and disease
							ecology
			Unit 4: Ecology	Policy and	Native Plants,	Environmental	Sustainability,
			67	, AdvocacyEnvironm	Water	Responsibility,	Health and
				ental Impact,	Conservation,	Honesty and	Safety,
				Vulnerability and	Soil Health,	Transparency,	Innovation and
				Resilience, Access	Biodiversity,	Customer Respect	Progress,
				and Equity,	Sustainable	and Service,	Integrity and
				Gendered	Design, Waste	Integrity in Business	Honesty, Respect
				Perspectives	Reduction,	Practices,	for Nature, Social
				reispeetives	Education and	Compliance with	Responsibility,
					Community	Regulations	Empathy and
					Engagement	Regulations	Compassion
					Engagement		Compassion
			A CONTRACTOR				

12	B.Sc.	Paper- XII	V	Unit 1: Carbohydrates	Carbohydrates are	Agricultural	Nutrition and	Human Rights,
	ш	Plant		, Metabolism	essential	Practices,	Dietary Advice,	Research Ethics,
	(201	Biochemistr			macronutrients	Climate	Food Industry	Cultural
	8-	v			that serve as a	Change,Greenh	Practices,	Sensitivity,
	2020				major source of	ouse Gas	Agricultural Ethics,	Agricultural and
	)				energy for the	Emissions,	Public Health,	Environmental
					body. They are	Sustainable	Research Integrity,	Impact
					made up of	Practices, Food	Patient	
					carbon, hydrogen,	Choices, Dietary	Confidentiality	
					and oxygen	Shifts,		
				Unit 2: Lipid Metabolism	Lipids are a diverse	Pollution and	Integrity in	Health and Well-
					group of organic	Contamination,	Research,	being,
					compounds that	Biodegradation,	Responsible	Sustainability,
					are insoluble in	Biodiversity and	Application,	Equity and
					water but soluble	Ecosystems,	Environmental	Accessibility,
					in organic	Climate Change,	Impact, Animal	Scientific
					solvents. They play	Sustainable	Welfare	Integrity,
					several crucial	Practices		Cultural
					roles in biological			Sensitivity
					systems			
				Unit 3: Protein	Proteins are	Resource	Scientific Integrity,	Human Health
				Metabolisum	essential	Efficiency,	Respect for Human	and Safety,
					macromolecules	Greenhouse	and Animal	Animal Welfare,
					made up of amino	Gas Emissions,	Subjects, Privacy	Environmental
					acids. They play	Land Use and	and Confidentiality,	Impact, Equity
					numerous vital	Deforestation,	Ethical Use of	and Access,
					roles in the body,	Water	Genetic	Education and
					including	Consumption,	Information,	Communication,
				SPANDAN ASC	structural,	Waste and		Professional
					functional, and	Pollution,		Conduct
				Carrow and	regulatory			
					functions.			

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		Unit 4: Nucleic Acids	Nucleic Acids and	Biodiversity	Scientific Integrity,	Respect for Life,
			gender awareness	Monitoring,	Respect for Human	Human Dignity,
			intersect in various	Pollution	and Animal	Animal Welfare,
			important ways,	Detection and	Subjects, Privacy	Integrity and
			particularly in the	Management,	and Confidentiality,	Honesty,
			context of	Genetically	Ethical Use of	Responsibility
			research,	Engineered	Genetic	and
			healthcare, and	Organisms,	Information,	Accountability,
			education.	Microbial		Compassion and
				Bioremediation,		Empathy,
				Gene		Respect for
				Expression		Diversity,
				Studies, Genetic		Education and
				Adaptation,		Knowledge
				Genetic		Sharing
				Diversity		0
				Diversity		
			NADAHA			
			S SE			
			CONTRACTOR OF ST			

13	B.Sc. III (201 8- 2020 )	Paper- XIII Biology of Vascular Plants	VI	Unit 1: Pteridophytes	1. Challenge traditional gender binaries: By showing that reproductive structures can be complex and non- binary 2.Promote understanding of diversity: By highlighting the varied reproductive strategies in pteridophytes 3. Encourage inclusive language: By using gender- neutral terms when discussing	Ecological niches; Carbon sequestration; Soil ; ater cycling; Biodiversity hotspots; Air quality improvement; Climate change indicators Traditional uses and conservation; Invasive species management; Education and research:	Responsible collection and sampling; Accurate identification and documentation; Sustainable cultivation and trade; Respect for indigenous knowledge and rights; Collaboration and knowledge sharing; Transparency and accountability; Adherence to regulations and laws; Continuing education and professional	Ornamental value; Cultural significance; Food source; Medicinal uses; Cultural significance; Economic importance; Environmental indicators; Soil conservation
				Unit 2: Gymnosperms	Representation, equity	Conservation, climate change , ecosystem services	development; Cultural sensitivity and awarenes	cultural significance, educational value and conservation ethics

Unit 3: Angiosperms	Representation, equity	Biodiversity, conservation status, impact of human activities	Ethical claiification. Respectful naming	Cultural significance, environmental stewardship, educational outreach
Unit 4: Anatomy	Inclusive language: Use gender-neutral language when describing plant structure and development. Representation: Highlight contributions of female botanists and scientists in understanding plant anatomy.	Ecological significance: Emphasize the importance of plant structure and function in supporting ecosystems. Sustainability: Discuss sustainable practices for plant growth and development, such as reducing waste and conserving resources.	Accurate representation: Accurately represent plant structure and development in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	Appreciation for nature: Foster appreciation for the complexity and beauty of plant structure and development. Responsible stewardship: Encourage responsible stewardship of plant resources for sustainable development.

14	B.Sc.	Paper- XIV	VI	Unit 1: Microbiolgy	Diversity in the	Education and	1. Responsible	1. Vaccine
	Ш	Microbiolo			lab: Inclusive	outreach;	research practices	development
	(201	gy and			language and	Water quality		and distribution
	8-	Plant			practices;	and	2. Biosafety and	2. Infection
	2020	Pathology			Research focus	management;	biosecurity:	control and
	)			S HADAWASC	and applications;	Agroecology		public health 3.
					Role models and	and sustainable	3. Informed	Antimicrobial
				Contraction of the second	mentorship;	agriculture;	consent:	resistance and
				CONTRACT OF CONTRACT	Addressing biases	Microplastics		stewardship; 4.
					and barriers:;	and pollution;	4. Confidentiality	Microbiome
					Gender-sensitive	Environmental	and data	research and
					research methods:	monitoring;	protection:	manipulation;
						Pollution and		5.Synthetic
						remediation		biology and
								bioengineering;
								6. Biodefense
								and dual-use
								research

	Unit 2: Microbial Genetics	Microbial Genetics	Intersection of	The intersection of	The study of
		is the study of the	microbial	microbial genetics	microbial
		genetic makeup	genetics and	and professional	genetics
		and processes of	environmental	ethics is crucial for	intersects with
		microorganisms,	awareness is	ensuring that	human values in
		including bacteria,	crucial for	research and	significant ways,
		viruses, fungi, and	understanding	applications in this	as it involves
		protists.	how microbes	field are conducted	ethical
		protists.	interact with	responsibly and	considerations,
			their	with integrity.	societal impacts,
			environments	Microbial genetics,	and the broader
			and how	which involves the	implications for
			environmental	study of the genetic	human health
			factors	material of	and the
	SUDAWAS		influence	microorganisms and	environment.
			microbial	how it influences	Understanding
	and the second s		behavior,	their behavior and	these
	-TATALAN		diversity, and	functions, raises	intersections
			genetic traits.	several ethical	helps ensure that
			Integrating	considerations that	advances in
			environmental	must be addressed	microbial
			considerations	to uphold scientific	genetics are
			into microbial	and professional	conducted
			genetics	standards.	responsibly and
			research can		in alignment with
			enhance our		societal norms
			understanding		and values.
			of microbial		
			ecology,		
			improve		
			environmental		
			practices, and		
			promote		
			sustainability.		

		Unit 3: Plant Pathology	Plant Pathology	The field of	Temperature,	The intersection
			and gender	plant pathology,	humidity, and	of plant
			awareness	which focuses	precipitation levels	pathology and
			intersect in	on the study of	significantly	human values
			meaningful ways,	plant diseases	influence the	encompasses a
			especially in the	and their	development and	range of ethical,
			contexts of	management,	spread of plant	social, and
			research,	intersects	diseases. For	environmental
			agriculture, and	significantly	example, high	considerations
			education.	with	humidity can	that guide how
			Understanding	environmental	promote fungal	plant diseases
			these intersections	awareness.	growth, while	are studied,
			helps ensure that	Integrating	temperature	managed, and
			advancements in	environmental	extremes can affect	controlled.
			plant pathology	considerations	pathogen survival.	Understanding
			are inclusive and	into plant		these
			equitable.	pathology can		connections
				lead to more		helps ensure that
				sustainable and		plant pathology
				effective		practices align
				disease		with broader
				management		societal values
		UNDAL .		practices.		and contribute
		and the second				positively to both
						human well-
		Contraction of the				being and
						environmental
						sustainability.

		Unit 4: Study of Plant	The study of plant	Changes in	The study of plant	The study of
		diseases	diseases, also	temperature,	diseases and	plant diseases is
			known as plant	precipitation,	environmental	deeply
			pathology, and	and humidity	awareness are	intertwined with
			gender awareness	due to climate	deeply	human values, as
			can intersect in	change can	interconnected	it impacts
			several meaningful	alter the	fields, as	various aspects
			ways. Addressing	distribution and	environmental	of society
			gender issues in	severity of plant	factors play a	including food
			this field can lead	diseases. For	significant role in	security,
			to more equitable	example,	the prevalence and	environmental
			opportunities and	warmer	management of	health, economic
			potentially	temperatures	plant diseases.	stability, and
			enhance the	may extend the		cultural
			quality and impact	range of certain		practices.
			of research.	pathogens or		Understanding
				increase the		and addressing
				frequency of		these
				disease		intersections
				outbreaks.		ensures that
						plant disease
						management
		A A A A A A A A A A A A A A A A A A A				and research
		(三)(四)				align with ethical
		And King Rel.				principles and
						contribute
						positively to
						human well-
						being and
						environmental
						sustainability.

15	B.Sc.	Paper- XV	VI	Unit 1: Plant Improvement	Plant	Plant diseases	Integrating	The study and
1.2		Paper- XV Plant	VI			can affect	environmental	•
					improvements—			practice of plant
	(201	breeding,			encompassing	entire	awareness into	improvements,
	8-	Biostatistics			areas like crop	ecosystems by	plant improvement	including
	2020	,			breeding, genetic	disrupting plant	efforts is crucial for	breeding and
	)	Ethnobotan			modification, and	communities,	developing	biotechnology,
		y and			sustainable	altering	sustainable	intersect with
		Horticultur			agricultural	nutrient cycles,	agricultural	human values in
		e			practices—can	and impacting	practices and	several
					benefit from	wildlife.	enhancing	important ways.
					integrating gender	Studying plant	ecosystem health.	Plant
					awareness in	diseases	Plant improvement,	improvements
					various ways.	through an	which involves	can significantly
						environmental	breeding and	impact food
						lens helps	genetic	security,
						understand	modification to	environmental
						these broader	enhance crop traits	sustainability,
						ecological	such as yield,	economic
						impacts.	disease resistance,	stability, and
						impacts.	and stress	cultural
							tolerance, must be	practices.
								practices.
							approached with an	
							understanding of	
							environmental	
							impacts and	
1							sustainability.	
				The Contraction				

	Unit 2: Ethanobotany	In many cultures,	Ethnobotany,	Ethnobotany, the	Ethnobotany, the
		knowledge about	the study of the	study of how	study of how
		plants and their	relationships	different cultures	people from
		uses is gendered.	between people	use plants for	various cultures
		Men and women	and plants, and	various purposes,	use plants,
		may have different	environmental	intersects	intersects with
		roles in the	awareness are	significantly with	human values in
		collection,	closely	environmental	several
		preparation, and	interconnected.	awareness.	meaningful ways.
		application of	Understanding	Understanding this	This field
		plant materials.	how traditional	relationship helps in	encompasses the
		Recognizing these	and local	promoting	relationships
		roles helps in	knowledge	sustainable	between people
		accurately	about plants	practices,	and plants,
		documenting and	can contribute	conserving	including the
		understanding	to	biodiversity, and	uses of plants for
		traditional	environmental	supporting	food, medicine,
		practices.	conservation	indigenous	rituals, and other
			and	knowledge systems.	cultural
			sustainability is		practices.
			a key aspect of		
			ethnobotanical		
			research.		
	Unit 3:	Biostatistics	Data Collection	Integrity and	Accountability,
	A MANASCA	involves the	and Analysis,	Honesty, Respect	Transparency
		application of	Risk	for Life,	and
	Dual King Ball	statistical methods	Assessment,	Confidentiality,	Accountability,
		to biological,	Monitoring and	Compliance with	Open
		medical, and	Evaluation,	Regulations, Ethical	Communication,
	Biostatistics	health-related	Predictive	Use of Resources,	Ongoing
		research. It is	Modeling,	Education and	Improvement,
		crucial for	Communicating	Mentorship, Public	Transparency
		designing	Results,	Engagement	and
		experiments,	Supporting		Accountability,

	analyzing data, and drawing valid conclusions from scientific studies.	Research		Prevention of Harm
Unit 4: Horticulture	Diverse Perspectives and Innovations, Equitable Opportunities, Addressing Historical Imbalances, Improved Collaboration and Productivity, Educational Access, Career Opportunities, Research and Development, Workplace Culture, Consumer Perspectives, Policy and Advocacy	Native Plants, Water Conservation, Soil Health, Biodiversity, Sustainable Design, Waste Reduction, Education and Community Engagement	Environmental Responsibility, Honesty and Transparency, Customer Respect and Service, Integrity in Business Practices, Compliance with Regulations	Sustainability, Health and Safety, Innovation and Progress, Integrity and Honesty, Respect for Nature, Social Responsibility, Empathy and Compassion

16	B.Sc.	Paper- XVI	VI	Unit 1: Nucleic Acid: Carrier	Nucleic Acids and	Biodiversity	Scientific Integrity,	Respect for Life,
10	III	Molecular	<b>v</b> .	of genetic information	gender awareness	Monitoring,	Respect for Human	Human Dignity,
	(201	Biology and		or genetic information	intersect in various	Pollution	and Animal	Animal Welfare,
	8-	Biotechnol			important ways,	Detection and	Subjects, Privacy	Integrity and
	2020	ogy			particularly in the	Management,	and Confidentiality,	Honesty,
	1	Ogy			context of	Genetically	Ethical Use of	Responsibility
	,				research,	Engineered	Genetic	and
					healthcare, and	Organisms,	Information,	Accountability,
					education.	Microbial	information,	Compassion and
					education.	Bioremediation,		
						Gene		Empathy, Respect for
								•
						Expression		Diversity,
						Studies, Genetic		Education and
						Adaptation,		Knowledge
						Genetic		Sharing
						Diversity		
				Unit 2: Recombinant DNA	Recombinant DNA	Bioremediation,	Safety and Risk	Respect for
				Technology	Technology and	Protecting	Management,	Human Dignity,
					gender awareness	Endangered	Informed Consent,	Beneficence and
					intersect in	Species, Genetic	Professional	Non-
				* ADDAM &	important ways,	Resilience,	Integrity,	Maleficence,
				and the second	especially in the	Research and	Compliance with	Justice and
					contexts of	Collaboration,	Regulations, Equity	Fairness
				CAMERINA RUL	research,	Regulation and	and Access	
					biotechnology	Monitoring,		
					applications, and	Ecological		
					policy	Impact, Public		
					development.	Engagement		

	Unit 3: Genetic Engineering	Sex	Preservation of	Autonomy,	Enhancement vs.
	5 - 5	Determination,	Endangered	Beneficence,	Therapy,
		Medical	Species,	Informed Consent,	Beneficence and
		Applications,	Environmental	Respect for Privacy,	Well-being,
		Ethical Concerns,	Conservation,	Justice, Honest	Health and
		Societal Impact,	Potential Risks	Communication	Improvement,
		Current Research	and Concerns,		Integrity and
		and Developments	Biodiversity		Respect for
			Loss		Nature
	Unit 4: Plant Tissue culture	1. Inclusive	1. Using	Responsible	1. Sustainability;
		research teams;	renewable	research practices:	<ol><li>Food security;</li></ol>
		2. Gender-sensitive	energy sources	2.Proper citation	3. Health and
		research design 3.	2.	and credit 3.	wellness; 4.
		Empowering	Implementing	Intellectual	Environmental
		women farmers: 4.	waste reduction	property respect 4.	stewardship; 5.
		Addressing gender	and recycling	Biosafety and	Economic
		disparities5.	strategies	biosecurity 5.	growth; 6.
		Gender-aware	3. Developing	Informed consent 6.	Cultural
		extension services	resource-	Confidentiality and	preservation 7.
		6.Inclusive	efficient	data protection	Education and
		language and	systems; 4.	7.Collaboration and	innovation 8.
		communication 7.	Ensuring proper	mentorship	Equity and
		Supporting women	containment		access 9. Global
		in STEM	and		cooperation
			management of		
			plant species; 5.		
			Promoting		
			sustainable		
			agriculture		
			practices		





XI.Sc. I

Det	ails of Cross	Details of	Creat	POST GRADUAT	E DEPARTMENT OF	BOTANY M. Sc. I (20	022-23)	AND AN ALL OR
Dett		Details of	Cross	Cutting Issues relevan	t with Gender Awarenes	ss,Environmental Awar	eness, Professional Ethic	s and Human Values
Sr. No.	Name of the Course	Title of Paper	Sem	Name of the Unit	Gender Awareness	Details of Cross Cuttin Environmental Awareness	ng Issues relevant with Professional Ethics	Human Values
				1. General Character of Fungi	<ol> <li>Inclusive language: Use gender-neutral language when describing fungi and their roles.</li> <li>Representation: Highlight contributions of female mycologists (fungi scientists) in understanding fungi.</li> </ol>	<ol> <li>Ecological significance: Emphasize the importance of fungi in ecosystem balance, decomposition, and nutrient cycling.</li> <li>Conservation: Highlight the impact of human activities on fungal diversity and ecosystems.</li> </ol>	2.Responsible application: Promote responsible application of fungal	1.Responsible stewardship: Encourage responsible stewardship of fungal resources for sustainable development. 2.Curiosity and wonder: Inspire curiosity and wonder about the biology and ecology of fungi.
		Paper I Biology and		2. Biodiversity and Taxonomy of fungi	1.Representation: Highlight contributions of female mycologists in understanding fungal biodiversity. 2. Equal opportunities: Ensure equal access to education and career opportunities in mycology.	of human activities on fungal diversity and ecosystems. 2. Sustainability: Discuss sustainable practices for managing fungal diversity and	<ol> <li>Accurate documentation: Ensure accurate documentation and reporting of fungal diversity.</li> <li>Objective research: Approach research on fungal diversity with objectivity, avoiding bias and assumptions.</li> </ol>	<ol> <li>Appreciation for nature: Foster appreciation for the fascinating world of fungi and their importance in ecosystems.</li> <li>Responsible stewardship: Encourage responsible stewardship of fungal diversity for sustainable development.</li> </ol>

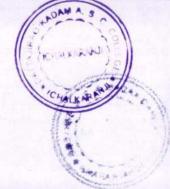


Sr.	Name of the	Title of	Sem	Name of the Unit	1	Details of Cross Cuttin Environmental	g Issues relevant with	
				4. Bryophytes	<ol> <li>Inclusive language: Use gender-neutral language when describing bryophytes and their roles.</li> <li>Representation: Highlight contributions of female bryologists in understanding bryophytes.</li> </ol>	<ol> <li>Ecological significance: Emphasize the importance of bryophytes in ecosystem balance, soil formation, and water cycling.</li> <li>Conservation: Highlight the impact of human activities on bryophyte diversity and ecosystems.</li> </ol>	<ol> <li>Accurate identification: Ensure accurate identification and classification of bryophytes.</li> <li>Objective research: Approach research on bryophytes with objectivity, avoiding bias and assumptions.</li> </ol>	<ol> <li>Responsible stewardship: Encourage responsible stewardship of bryophyte habitats for sustainable development.</li> <li>Curiosity and wonder: Inspire curiosity and wonder about the biology and ecology of bryophytes.</li> </ol>
1	M.ScI Botany	Diversity of Fungi, Algae and Bryophyte S	I	3. Algae	<ol> <li>Representation: Highlight contributions of female phycologists (algae scientists) in understanding algae.</li> <li>Equal opportunities: Ensure equal access to education and career opportunities in phycology.</li> </ol>	and global carbon cycling. 2. Conservation: Highlight the impact of human activities on algal diversity and ecosystems.	Approach research on algae with objectivity, avoiding bias and assumptions.	<ol> <li>Appreciation for nature: Foster appreciation for the fascinating world of algae and their importance in ecosystems.</li> <li>Responsible stewardship: Encourage responsible stewardship of algal resources for sustainable development.</li> </ol>

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		1. Classification of Pteridophytes	<ol> <li>Inclusive language: Use gender-neutral language when describing pteridophytes and their classification.</li> <li>Representation: Highlight contributions of female pteridologists in understanding pteridophyte diversity.</li> </ol>	<ol> <li>Ecological significance: Emphasize the importance of pteridophytes in ecosystem balance, soil formation, and water cycling.</li> <li>Conservation: Highlight the impact of human activities on pteridophyte diversity and ecosystems.</li> </ol>		<ol> <li>Appreciation for nature: Foster appreciation for the fascinating world of pteridophytes and their importance in ecosystems.</li> <li>Responsible stewardship: Encourage responsible stewardship of pteridophyte habitats for sustainable development.</li> </ol>
1 M.ScI Botany	Paper II Biology and Diversity of Pteridophy I tes,	2. Classification of Gymnosperms	<ol> <li>Representation: Highlight contributions of female botanists in understanding gymnosperm diversity.</li> <li>Equal opportunities: Ensure equal access to education and career opportunities in botany.</li> </ol>	<ol> <li>Ecological significance: Emphasize the importance of gymnosperms in ecosystem balance, soil formation, and water cycling.</li> <li>Conservation: Highlight the impact of human activities on gymnosperm diversity and ecosystems.</li> </ol>	2. Responsible application: Promote responsible application of gymnosperm knowledge,	<ol> <li>Responsible stewardship: Encourage responsible stewardship of gymnosperm habitats for sustainable development.</li> <li>Curiosity and wonder: Inspire curiosity and wonder about the biology and ecology of gymnosperms.</li> </ol>



		Gymnospe rms and Palarobota ny		3. Morphology, Anatomy and Evolutionary trends in Palaeobotany	<ol> <li>Representation: Highlight contributions of female paleobotanists in understanding plant evolution.</li> <li>Equal opportunities: Ensure equal access to education and career opportunities in paleobotany.</li> </ol>	<ol> <li>Conservation: Highlight the impact of human activities on plant diversity and ecosystems.</li> <li>Sustainability: Discuss sustainable practices for managing plant resources and promoting ecological integrity.</li> </ol>	<ol> <li>Accurate         <ul> <li>interpretation: Ensure             accurate interpretation             of fossil evidence and             plant morphology.</li> <li>Objective research:             Approach research on             plant evolution with             objectivity, avoiding             bias and assumptions.</li> </ul> </li> </ol>	<ol> <li>Curiosity and wonder: Inspire curiosity and wonder about the evolution of plant diversity.</li> <li>Responsible stewardship: Encourage responsible stewardship of plant resources for sustainable development.</li> </ol>
				4. Study of geological time scale.	<ol> <li>Inclusive language: Use gender-neutral language when describing geological concepts.</li> <li>Representation: Highlight contributions of female geologists in understanding Earth's history.</li> </ol>	<ol> <li>Sustainability: Discuss sustainable practices for managing Earth's resources and promoting ecological integrity.</li> <li>Ecological significance: Emphasize the importance of understanding Earth's history in the context of environmental change.</li> </ol>	<ol> <li>Objective research: Approach research on Earth's history with objectivity, avoiding bias and assumptions.</li> <li>Responsible application: Promote responsible application of geological knowledge, considering environmental and social implications.</li> </ol>	<ol> <li>Responsible stewardship: Encourage responsible stewardship of Earth's resources for sustainable development.</li> <li>Appreciation for Earth's history: Foster appreciation for the vast and complex history of our planet.</li> </ol>
-	Name of						g Issues relevant with	Contra Int
Sr. No.	the Course	Title of Paper	Sem	Name of the Unit	Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
				1.Laboratory discipline, Microscopy, Biostatistic	1. Inclusive language: Use gender-neutral language in laboratory settings and scientific writing.	Sustainable practices: Implement sustainable practices in laboratory settings, such as reducing waste and energy consumption.	Objectivity: Maintain objectivity in laboratory research and avoid bias.	Accountability: Encourage accountability for actions and decisions in laboratory research.

M.ScI Botany	PAPER-III (CC-103): TOOLS AND	I	Separation Techniques, Chromatographic Techniques, Electrophoretic Techniques	1. Inclusive language: Use gender-neutral language in scientific writing and laboratory settings.	Sustainable practices: Implement sustainable practices in laboratory settings, such as reducing waste and energy consumption.	Accurate data: Ensure accurate and reliable data collection and analysis.	Curiosity and wonder: Inspire curiosity and wonder about the natural world through laboratory discovery.
	TECHNIQ UES		Spectroscopic Techniques, Radioisotope Techniques	Inclusive language: Use gender-neutral language in scientific writing and laboratory settings.	Environmental monito	Responsible conduct: Promote responsible conduct of research and adherence to ethical guidelines.	Respect for life: Foster respect for life and living organisms in laboratory research
			Collection and Preservation of plant material.	Equal access: Provide equal access to plant collection and preservation resources and training for all individuals.	Conservation: Prioritize plant conservation and preservation for future generations.	Responsible collecting: Promote responsible plant collecting practices, avoiding over- collection and habitat destruction.	Respect for nature: Foster respect for plant diversity and the natural world.
Name of the Course	Title of Paper	Sem	Name of the Unit	Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
	PAPER- IV (CC – 104/ CCO –104):		Biological Diversity	It includes addressing issues such as wage gaps, access to education and healthcare, and representation in decision-making processes.	Involves understanding and recognizing the importance of protecting natural environments and resources.	Refers to the moral principles and standards that guide behavior in the workplace. This includes integrity, accountability, fairness, and respect for others.	Encompass the principles and beliefs that guide individuals' actions and interactions. Values such as respect, compassion, honesty, and justice play a crucial role ir shaping personal behavior and societal norms.

M.ScI Botany	BIODIVE RSITY: CONSER VATION AND UTILISAT ION	Ι	Biodiversity Conservation	Addressing Gendered Impacts: Recognizing and addressing how environmental issues and conservation efforts differently impact various genders.		Transparency: Ensuring that decisions and actions related to biodiversity and environmental conservation are transparent and based on sound science and ethical considerations.	Respect for Nature
			In- situ conservation	Equal Access to Benefits	Community Engagement	Respect for Local Knowledge	Compassion and Stewardship
			WILD PLANT RESOURCES AND THEIR UTILIZATION	Inclusive Decision	Ecosystem Health	Respect for Indigenous Knowledge	Respect for Biodiversity
Name of the	Title of	Sem	Name of the Unit		Details of Cross Cuttin Environmental	g Issues relevant with Professional Ethics	Human Values
Course	Paper	•		Gender Awareness	Awareness		
			Taxonomy taxonomic tools	Gender equality in research teams promotes varied perspectives and inclusive approaches.	Biodiversity Monitoring: Tools such as field guides and databases help track species distribution and health, which is essential for monitoring the impact of environmental changes and human activities.	Data Integrity: Maintaining high standards of data accuracy and transparency is crucial.	Respect for Life: Taxonomy inherently involves respect for all forms of life. Ethical considerations include humane treatment of specimens and avoiding unnecessary harm.



M.ScI Botany	Paper-V (CC-201): Angiosper m Systematic	п	Evolutionary concepts, plant speciation, reproductive isolating mechanisms	Equitable Opportunities: Ensuring equal opportunities for all genders in research funding, leadership roles, and academic positions helps balance contributions and innovations in the field.	onservation Efforts: Understanding plant speciation helps in conserving biodiversity.	Respect for Intellectual Property: Ethical considerations include respecting intellectual property rights related to genetic and taxonomic discoveries, ensuring proper acknowledgment and credit in scientific research.	Education and Advocacy: Raising awareness about environmental issues and plant speciation fosters a greater appreciation for biodiversity and encourages ethical behavior towards the environment.
	S		Taxometrics, cladistics, systems of angiosperm classification	Ensuring diverse repre	Taxometrics can help in understanding patterns of biodiversity and the impacts of environmental changes on species distributions, informing conservation efforts.	Adhering to ethical standards in data collection and analysis ensures accuracy and reliability, respecting the integrity of scientific work.	Taxometrics should be applied in ways that respect and value the diversity of life, promoting conservation and sustainable use of resources.
			Families of angiosperms,	Representation: Highlight contributions of female botanists in understanding angiosperm diversity.	Conservation: Emphasize the importance of conserving angiosperm diversity for ecosystem health.	Accurate classification: Ensure accurate and up-to- date classification of angiosperm families.	Appreciation for diversity: Foster appreciation for the diversity of angiosperm familie and their importance in human life.
Name of the Course	Title of Paper	Sem	Name of the Unit	I Gender Awareness	Environmental	g Issues relevant with Professional Ethics	Human Values



the Course	Paper	•	Name of the Unit	Gender Awareness	Environmental	Professional Ethics	Human Values
Name of	Title of	Sem	Nome of the Unit	1	Details of Cross Cuttin	g Issues relevant with	
			4.History, symptomology, causal organism, etiology and management of viral and MLO diseases.	In the field of medicine and health, gender equality ensures that research, treatment, and resources are allocated fairly without discrimination.	Environmental factors influence the spread and management of diseases.	Adhering to safety protocols to protect laboratory workers and prevent the spread of infections.	Upholding responsibility for the well-being of both individuals an the environment in the context of disease prevention and management.
M.ScI Botany	(CC-202): Plant Pathology	Ш	3.History, symptomology, causal organism, etiology and management of fungal and bacterial diseases	In the field of medicine and health, gender equality ensures that research, treatment, and resources are allocated fairly without discrimination.	Environmental factors influence the spread and management of diseases.	Providing care without bias.	Values such as empathy, respect, and integrity are fundamental in healthcare.
	Paper-VI		2.Introductory Virolo	Gender equality in the workplace ensures that safety protocols and protective measures are equally applied to all employees, regardless of gender.	environmentally friendly practices	Patients must be informed about the nature of their viral infections and treatment options.	Conducting research and reporting results honestly and ethically.
			1.History of plant dis		environmental impact of disease control measures and strive to mitigate negative effects on ecosystems.	disease research.	Use plant disease knowledge to support conservation efforts protecting both agricultural crops and natural plant communities.

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		1.Gametophyte in Angiosperms	Equal access to education and research opportunities in plant sciences helps in balancing representation and contributes to innovative advancements in the field.	plant species.	Ethical research practices include respecting and protecting plant biodiversity, avoiding harm to ecosystems, and ensuring responsible use of genetic modifications.	Valuing the complexity and importance of plant life, including the gametophyte stage, promotes a deeper appreciation for nature and fosters efforts to protect and preserve plant species.
	PAPER- VII (CC- 203): PLANT	2.Gametogenesis, fertilization and early development, Polyembryony	understanding of	Promoting sustainable agricultural practices that consider reproductive health impacts can lead to healthier ecosystems and better outcomes for plant and animal species.	When researching or utilizing polyembryony, ethical guidelines should be followed to ensure responsible use of genetic and reproductive technologies.	Providing empathetic care and support for individuals facing reproductive challenges or undergoing treatments.
M.Sc. Botar	I URE I	II 3.Morphogenesis and organogenesis in plants	Ensuring equal opportunities in plant science research and education for all genders helps bring diverse perspectives and innovations in understanding plant development processes.	Awareness of how climate change affects plant development and morphology can inform strategies to adapt agriculture and conservation efforts to changing conditions.	When using plant materials in research, ethical considerations include minimizing harm and ensuring that research practices are conducted responsibly.	nature and drives

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			4.Palynology: Palynotaxonomy	Gender equality in leadership roles and research teams helps in creating a more inclusive and effective research environment, encouraging innovative solutions and collaboration.	Studying pollen and spore records helps track changes in plant biodiversity and informs conservation strategies to protect endangered species and habitats.	credit to collaborators and acknowledging their contributions in publications and	Applying knowledge from palynology to promote sustainable environmental practices and conservation efforts supports the well- being of both current and future generations.
Name of	Title of	Sem	a start start	1	Details of Cross Cuttin	g Issues relevant with	
the Course	Paper	·	Name of the Unit	Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
			1. Dynamic cell ,Plasma membrane	Equal access to educational and research opportunities allows all individuals, regardless of gender, to contribute to advancements in cell biology and related fields.	Utilizing cellular processes and organisms in bioremediation to clean up pollutants and restore environmental health demonstrates an application of cell biology in addressing environmental issues.	Ensuring accuracy in experimental results and transparency in reporting findings maintains the credibility and reliability of research.	Applying knowledge from ce biology to improve human health, develop treatments for diseases, and enhance overall quality of life reflects a commitment to human welfare and well-being.
M.ScI	Paper-VIII (CC-204): Cell and		2.Cell division: Mitosis and meiosis	Providing equal access to educational and career opportunities in cell biology promotes diversity and allows individuals of all genders to contribute to scientific advancements	Understanding how environmental stressors such as radiation, pollutants, and temperature changes affect cell division is crucial for assessing risks and developing mitigation strategies.	Maintaining accuracy and transparency in research findings on mitosis and meiosis is essential for advancing scientific knowledge and ensuring reliable results.	Valuing the complexity and importance of cell division processes highlights the significance of understanding biological mechanisms that underlie growth, reproduction, and health.

Dotany	Molecular Bioloy	3.Cell signaling	Providing equal opportunities for all genders in education and career advancement within the field of cell signaling supports a more equitable and inclusive scientific community.	Understanding how environmental factors such as pollutants, toxins, and climate change affect cell signaling pathways can inform strategies to mitigate these impacts and protect human health.	Maintaining integrity in reporting results and ensuring transparency in research practices are essential for advancing scientific knowledge and ensuring reproducibility.	Valuing the complexity of cell signaling pathways highlights the importance of understanding biological processes that are fundamental to health and disease.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		4.Cellular communication	Providing equal access to educational and research opportunities in cellular communication helps create a balanced and inclusive scientific community.	Advancements in understanding cellular communication can lead to the development of therapies for diseases affected by signaling disruptions, promoting overall health and sustainability.	Ensuring accuracy and transparency in research on cellular communication is crucial for advancing scientific knowledge and maintaining trust in research findings.	Valuing the complexity and importance of cellular communication underscores the significance of understanding biological processes that underpin health and disease.



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	Name of		-			Details of Cross Cutting	g Issues relevant with	
Sr. No.	the Course	Title of Paper	Sem.	Name of the Unit	Gender Awareness	Environmental Awareness	<b>Professional Ethics</b>	Human Values
				1. Cytology	Sex Chromosomes and Cellular Studies, Hormonal Influences, Cellular Research and Gender Bias, Educational and Professional Context	Environmental Health,	Patient Confidentiality, Accuracy and Integrity, Informed Consent, Competence and Continuing Education	Compassion, Integrity, Respect, Responsibility
				2. Genetics of Prokaryotes and Eukaryotes	Sex, Factors,	Responses, Horizontal Gene Transfer, Gene Expression and Environmental Sensing, Stress, Symbiosis and Environmental		Safety and Risk Management, Biosafety and Biosecurity, Scientific Integrity, Human Health and Well-being, Privacy and Confidentiality
1	M.ScII Botany	CC301 Cytogenetics and crop improvement	Ш	3. Population and evolutionary genetics		Adaptation, Genetic Variation, Gene Flow and Migration, Environmental Stress	Public Engagement and Education, Responsible Conduct in Research, Transparency and Integrity, Respect for Diversity	Informed Consent, Fair Treatment, Addressing Health Disparities, Scientific Integrity, Responsibility and Accountability

M.Sc. II



				4. Classical and modern methods of crop breeding and improvement		Hybridization, Environmental Resilience, Precision Agriculture, Climate Change Adaptation	Knowledge, Mutagenesis, Pure-Line Selection, Genetic Engineering, CRISPR/Cas9, Molecular Marker-Assisted Selection (MAS)	Community Well- being, Innovation with Responsibility, Consistency and Reliability, Ethical Responsibility, Public Welfare, Respect for Intellectual Property
_	Name of					Details of Cross Cutting	g Issues relevant with	
Sr. No.	the Course	Title of Paper	Sem.	Name of the Unit	Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
				1. Introduction of Biotechnology	Biotechnology and gender awareness intersect in various ways, particularly in how	Genetically Modified Crops, Bioremediation, Conservation of Biodiversity, Climate	Environmental Impact, Food Safety and Nutrition, Socioeconomic Considerations, Ethical	Ethical Responsibility, Sustainability, Equity and Access,
					technology impacts agricultural practices, research opportunities, and economic benefits.	Change Mitigation, Sustainable Agriculture	Research Practices, Animal Welfare, Public Engagement and Education	Cultural Sensitivity Transparency and Public Engagement







Sr. No.	the	Title of Paper	Sem.	Name of the Unit	Gender Awareness	Environmental	Professional Ethics	Human Values
Sr. No.	Name of	Title of Paper	Sam	Name of the Unit		Details of Cross Cutting	g Issues relevant with	
				4. Genomics	Gender Bias in Research, Tailored Treatments, Genetic Diseases and Conditions, Educational and Professional Opportunities	Biodiversity and Conservation,Biodivers ity and Conservation,Climate Change Impact,Sustainable Agriculture	Genetic Editing and Modification,Responsibil ity to Future Generations,Transparenc y and Accountability,Cultural Sensitivity	Equity and Fairness,Beneficenc e and Non- Maleficence,Transp arency and Accountability,Cult ural Sensitivity and Respect
				3. Recombinant DNA technology	of research, biotechnology applications, and policy development.	Bioremediation, Protecting Endangered Species, Genetic Resilience, Research and Collaboration, Regulation and Monitoring, Ecological Impact, Public Engagement	Safety and Risk Management, Informed Consent, Professional Integrity, Compliance with Regulations, Equity and Access	Respect for Human Dignity, Beneficence and Non-Maleficence, Justice and Fairness
1	M.ScII Botany	DSE 304 Biotechnology and genetic engineering	ш		Representation and Participation,Equal Opportunities,Diverse Perspectives,Addressing Bias and Discrimination		Communication	
				2. Microbial biotechnology		Bioremediation, Waste Management, Climate Change Mitigation, Environmen tal Monitoring	Ethical Conduct in Research and Development, Risk Assessment and Management, Sustainable Practices, Public Engagement and Communication	Beneficial Applications,Ethical Conduct,Sustainabil ity and Environmental Stewardship,Health and Well-being







			1. General features of Fungi	<ol> <li>Inclusive language: Use gender-neutral language when describing fungi and their roles.</li> <li>Representation: Highlight contributions of female mycologists (fungi scientists) in understanding fungi.</li> </ol>	<ol> <li>Ecological significance: Emphasize the importance of fungi in ecosystem balance, decomposition, and nutrient cycling.</li> <li>Conservation: Highlight the impact of human activities on fungal diversity and ecosystems.</li> </ol>	1.Objective research: Approach research on fungi with objectivity, avoiding bias and assumptions. 2.Responsible application: Promote responsible application of fungal knowledge, considering environmental and social implications.	1.Responsible stewardship: Encourage responsible stewardship of fungal resources for sustainable development. 2.Curiosity and wonder: Inspire curiosity and wonder about the biology and ecology of fungi.
M.ScI Botany	CCS-302.2 Taxonomy of fungi	ш	2. Criterias used in classification of Fungi	Morphological Characteristics,Reproduc tive Structures,Biochemical Properties,Growth Patterns	Environmental	Integrity and Honesty,Respect for Biodiversity,Ethical Treatment of Human and Animal Subjects,Public Communication	Ethical Research Practices,Respect for Indigenous Knowledge,Public Health and Safety,Ethical Use of Resources
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			3. Criterias used in classification of Fungi	Morphological Characteristics,Reproduc tive Structures,Biochemical Properties,Growth Patterns	Ecological Role,Seasonal and Environmental Adaptations,Interaction with Other Organisms,Reproductiv e Strategies	Integrity and Honesty,Respect for Biodiversity,Ethical Treatment of Human and Animal Subjects,Public Communication	Ethical Research Practices,Respect for Indigenous Knowledge,Public Health and Safety,Ethical Use of Resources
			4. Microtomy	Gender Equity in Training and Careers, Creating Supportive Environments, Represent ation in Leadership, Health and Safety, Considerations	Sustainable Practices,Energy Efficiency,Recycling and Reuse,Environmental Impact of Laboratory Practices	Integrity and Accuracy,Confidentiality and Privacy,Safety and Compliance,Professional Competence	Respect for Human Dignity, Compassion and Empathy,Environme ntal Stewardship,Collab oration and
Name of the Course	Title of Paper	Sem.	Name of the Unit	Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
			1. Pinciples of 2. Role of enzymes and toxins in disease development	Equal Opportunities and Health and Safety Community Engagement Research Collaboration Field Practices and Application	-	Respect for Intellectual Public Trust and Accountability Safety and Risk Management	Community Respect for Human Health and Well- being,Equity and Fairness,Transparen cy and Honesty,Ethical Research and Development
M.ScII Botany	CCS-303.2 Integrated disease management	ш	3. Physiology and biochemestry of host pathogen interactions	Research Design and Data Collection,Gender- Sensitive Training,Workplace and Professional Development,Equitable Health Intervolutions	Host Defense Mechanisms,Pathogen Strategies,Environment al Factors Affecting Pathogen Dynamics,Human Activities and Disease	Informed Consent,Clinical and Therapeutic Ethics,Public Health and Policy Ethics,Professional Conduct	Respect for Human Dignity,Privacy Protection,Fair Access to Healthcare,Global Health Equity



				4. Genetics of host pathogen interactions	Genetic Differences Between Sexes,Gender- Specific Disease Susceptibility,Sex-Based Differences in Host- Pathogen Interactions,Research Considerations	Environmental Influences on Genetics, Impact of Environmental Changes on Host-Pathogen Dynamics, Genetic Variability and Environmental Adaptation, Research and Public Health Implications	Ethical Conduct in Research,Ethical Use of Genetic Information,Ethical Considerations in Genetic Research,Equity and Inclusivity	Autonomy and Respect,Protecting Personal Information,Equitab le Distribution,Diverse Representation
1	Name of		1.1			Details of Cross Cutting	g Issues relevant with	
	the Course	Title of Paper	Sem.	Name of the Unit	Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
				1. Membrane	Genetic and Hormonal	Impact of	Research	Value of Living
				2. Respiration and Lipid metabolism	Physiological Differences,Gender- Specific Respiratory Conditions,Research and Clinical Practices,	Climate Change,Exposure to Environmental Toxins,Green Research Practices,	Integrity and Honesty,Ethical Treatment of Subjects,Minimizing Harm	Beneficence and Well- Being,Addressing Disparities,Educatio nal Outreach
	M.ScII Botany	CC401: Plant Physiology and metabolism	IV	3. Sulphur metabolism	Diverse Research Teams,Bias Reduction	Sulfur Cycle in Ecosystems,Pollution and Environmental Impact,Sustainable Practices	Integrity in Research,Sustainable Practices, Ethical Use of Technology	Public Health,Scientific Integrity,Interdiscipl inary Cooperation
				4. Signal Trasduction and Phytoharmones	Biological Differences,Disease Presentation and Progression	Impact of Environmental Factors,Exposure Assessments,Sustainabl e Practices	Research Integrity,Respect for Intellectual Property,Environmental Responsibility,Ethical Considerations in Application	Truthfulness,Ethical Treatment of Subjects,Social Responsibility
	Name of					Details of Cross Cuttin	g Issues relevant with	
	the Course	Title of Paper	Sem.	Name of the Unit	Gender Awareness	Environmental Awareness	Professional Ethics	Human Values

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		1. Biological diversity	Gender Differences in Biodiversity Roles,Participation in Conservation Efforts,Impact of Biodiversity on Gender	Understanding Ecosystem Health,Impact of Environmental Changes,Integration of Biodiversity in Environmental Policies	Research Integrity,Respect for Intellectual Property,Environmental Responsibility,Ethical Considerations in Application	Moral Responsibility,Inter generational Equity,Cultural and Spiritual Significance
DSE 404 Biodiversity: conservation and Utilisation	IV	2. Principle of biodiversity conservation	Sustainability,Inclusion of Local Communities,Recognizin g Diverse Roles,Community Empowerment		Protected Areas and Reserves,Restoration and Rehabilitation,Communit y Involvement	Respect for Nature,Cultural Significance,Stewa dship
and Utilisation		3. Conservation	Understanding Gender Roles in Conservation, Addressing Gender- Specific Needs	Understanding Ecosystem Dynamics,Addressing Environmental Threats,Sustainable Practices	Respect for Biodiversity,Protection of Habitats,Conservation Priorities	Respect for Nature,Cultural Significance
		4. Wild plant resources and their utilisation	Understanding Gender Roles in Conservation, Addressing Gender- Specific Needs	Understanding Ecosystem Roles,Sustainable Harvesting Practices,Biodiversity Preservation	Respect for Biodiversity,Protection of Habitats,Conservation Priorities	Intrinsic Value of Plants,Ecological Harmony,Preservat on of Traditions
Title of Paper	Sem.	Name of the Unit		Details of Cross Cutting	g Issues relevant with	
	Jem.		Gender Awareness Biotechnology and Research,Education and Outreach	Environmental Bioremediation,Waste Management,Sustainabl e Agriculture	Professional Ethics Responsible Research and Development,Biosafety and Risk Management	Human Values Sustainability,Heal h and Well- being,Innovation and Progress
		2. Industrial production of enzymes and vitamins	Inclusion Programs, Training and Development	Resource Efficiency, Waste Management	Honest Reporting, Consumer Safety, Ethical Marketing	Ethical Supply Chains, Ethical Leadership
	Biodiversity: conservation	Biodiversity: conservation and Utilisation	DSE 404       IV         Biodiversity: conservation and Utilisation       IV         3. Conservation         and Utilisation         IV         4. Wild plant resources and their utilisation         Title of Paper       Sem.         Name of the Unit         I. Role of Fungi in Industry         Industrial production of	DSE 404     IV     Biodiversity Roles,Participation in Conservation Efforts,Impact of Biodiversity on Gender       DSE 404     IV     2. Principle of biodiversity conservation     Sustainability,Inclusion of Local Communities,Recognizin g Diverse Roles,Community Empowerment       and Utilisation     IV     3. Conservation     Understanding Gender Roles in Conservation, Addressing Gender- Specific Needs       Title of Paper     Sem.     Name of the Unit Industry     Understanding Gender- Specific Needs       1. Role of Fungi in Industry     Biotechnology and Research,Education and Outreach     Biotechnology and Research,Education and Outreach	DSE 404 BiodiversityBiodiversity Roles,Participation in Conservation Biodiversity on GenderEcosystem Health,Impact of Environmental Potection Biodiversity in Environmental PoliciesDSE 404 Biodiversity: conservation and Utilisation and UtilisationIV2. Principle of biodiversity conservation 3. ConservationSustainability,Inclusion of Local Communities,Recognizin Roles,Community EmpowermentEducation and Knowledge,Ecosystem Protection,Integrated Approaches,Community y Engagement3. Conservation and Utilisation and UtilisationS. ConservationUnderstanding Gender Roles in Conservation, Addressing Gender- Specific NeedsUnderstanding Ecosystem Understanding Gender Roles in Conservation, Addressing Gender- Specific NeedsUnderstanding Ecosystem Dynamics,Addressing Environmental Threats,Sustainable PracticesTitle of PaperSem.Name of the Unit IndustryBiotechnology and Research,Education and OutreachBioremediation,Waste Management,Sustainable e AgricultureTitle of PaperSem.Name of the Unit IndustryBiotechnology and Research,Education and OutreachBioremediation,Waste Management,Sustainable e Agriculture	DSE 404     Biodiversity     Biodiversity     Ecosystem     Integrity,Respect for Intellectual Conservation       DSE 404     Principle of biodiversity:     Sustainability,Inclusion of Local     Education and Knowledge,Ecosystem     Protected Areas and Reserves,Restoration and Conservation       DSE 404     Diodiversity:     Sustainability,Inclusion of Local     Education and Knowledge,Ecosystem     Protected Areas and Reserves,Restoration and Conservation       and Utilisation     Sconservation     Understanding Gender- Roles in Conservation, Addressing Gender- Specific Needs     Understanding Ecosystem     Respect for Biodiversity; Protection,Integrated Approaches,Communit y Engagement     Respect for Biodiversity,Protection of Biodiversity,Protection of Biodiversity,Protection of Addressing Gender- Specific Needs     Respect for Understanding Ecosystem     Respect for Biodiversity,Protection of Priorities       Title of Paper     Sem.     Name of the Unit Industry     Indeesting Gender- Specific Needs     Environmental Practices     Respect for Biodiversity,Protection of Roles, Sustainable Practices     Respect for Biodiversity,Protection of Roles, Sustainable Practices     Respect for Biodiversity,Protection of Roles,Sustainable Practices     Respect for Biodiversity,Protection of Roles,Sustainable Practices     Respect for Biodiversity,Protection of Roles,Sustainable Practices       Title of Paper     Sem.     Name of the Unit Industry     Biotechnology and Reserve,Research,Education and Outreach     Bioremediation,Waste Management,Sustainable Production of     Hoest Reporting, Consumer Saf





Botany	Industrial Mycology	IV	3. Industrial production of antibiotics	Pay Equity, Career Development	Resource Management, Waste Reduction, Environmental Standards	Transparency: Providing accurate information about antibiotic efficacy and safety.Honest Practices	Corporate Citizenshi, Respectful Work Environment
			4. Edible Fungi	Inclusive Hiring, Supportive Environment:	Biodiversity Preservation, Resource Efficiency	Honest Labeling, Ethical Claims	Community Support, Education and Awareness
Name of	Title of Paper	Sem.	Name of the Unit		Details of Cross Cutting	1	
 the				Gender Awareness	Environmental	Professional Ethics	Human Values
			1. Methods of Disease diagnosis	Healthcare Services, Representation, Training and Development	Waste Disposal, Sustainable Practices	Informed Consent, Confidentiality, Accuracy	Equity and Access, Affordability, Public Health
	CCS 403.2		2. Chemical methods	Workplace Equality, ncluding research, development, and management positions.	Sustainable Practices: Green Chemistry, Eco- Friendly Disposal	Safety and Compliance, Ethical Conduct:	Public Health and Safety, Ethical Research, Informed Decision-Making:
M.ScII Botany	Integrated Disease Managemebnt	IV	3. Integrated management of some important disease	Workforce Diversity, Opportunities, Inclusive Research	Impact Reduction: Minimizing Pollution, Eco-Friendly Solutions	Patient Rights, Honest Communication:	Access and Affordability, Public Health Initiatives, Compassionate Care
			4. Integrated management of some important disease	Workforce Diversity, Opportunities, Inclusive Research	Impact Reduction: Minimizing Pollution, Eco-Friendly Solutions	Patient Rights, Honest Communication:	Access and Affordability, Public Health Initiatives, Compassionate Care



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