DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI								
DEPARTMENT OF BOTANY								
					(2021-2023)	B.Sc. I		
Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values								
Sr. No.	**Name of the Course**	**Semester**	**Title of paper**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
1	B.Sc.-I (2021-23)	I	Paper I: Microbes, Algae and, Biofertilizers	1. Microbes, 1.1 Viruses	influences vulnerability	spread and evolution, habitat destruction.	Cultural sensitivity and awarenes	biosecurity, human rights, social 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,promote sustainable agriculture,mitigate climate change	Cultural sensitivity and awarenes	improve human well-being, health, and nutrition

DATTAJIRAO KADAM A. S. C. COLLEGE ICHALKARANJI

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

		I	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,Minimizing 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,Chemical Management,Green Chromatography	Ethical Use of Chemicals,Transparency and Reproducibility	use of personal protective equipment (PPE), proper handling of chemicals, and adherence to safety protocols
1	B.Sc.-I (2021-23)	II	Paper III: Mycology, Phytopathology 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.
		II	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
				2. Pteridophytes and Gymnosperms, 2.1 Pteridophytes	Representation, equity	Conservation, climate change	Cultural sensitivity and awarenes	Diversity, biosecurity

DATTAJIRAO KADAM A. S. C. COLLEGE ICHALKARANJI

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

				2.2 Gymnosperms,	Representation, equity	Conservation, climate change , ecosystem services	Cultural sensitivity and awarenes	cultural significance, educational value and conservation ethics

DATTAJIRAO KADAM A. S. C. COLLEGE ICHALKARANJI

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

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI							
DEPARTMENT OF BOTANY 2022-2023 B.Sc. II							
Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values							
Name of the Course	**Title of Paper**	**Sem .**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
				Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
B.Sc.-II Botany (2019-2023)	Paper V Embryology of Angiosperms	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.b Pollination and Fertilization	Equal opportunities: Ensure equal access to education and research opportunities in plant reproductive biology.	Sustainability: Promote sustainable practices in agriculture and horticulture to protect pollinators and plant diversity.	Responsible research: Conduct research on plant reproduction with consideration for environmental	Responsible stewardship: Encourage responsible stewardship of the natural world and promot

DATTAJIRAO KADAM A. S. C. COLLEGE ICHALKARANJI

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

						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: Highlight contributions of female scientists in understanding plant embryology and reproduction.	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 assumptions.	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.
			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, conside ne

						implications.	ethical implications.

DEPARTMENT OF BOTANY

Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values

Name of the Course	Title of Paper	Sem.	Name of the Unit	Details of Cross Cutting Issues relevant with			
				Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
B.Sc.-II Botany (2019-2023)	Paper VI Plant Physiology	III	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 agricul[illegible]e

			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, growth, and development. Representation: Highlight contributions of female scientists in understanding plant photosynthesis and development.	Ecological significance: Emphasize the crucial role of plant photosynthesis in supporting life on Earth. Climate change: Discuss the impact of climate change on plant growth and development.	Accurate representation: Accurately represent plant photosynthesis, growth, 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 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 is

					as reducing waste and conserving resources.	development with consideration for environmental and social implications.	growth, and development for global food security.

DEPARTMENT OF BOTANY

Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values

Name of the Course	Title of Paper	Sem.	Name of the Unit	Details of Cross Cutting Issues relevant with			
				Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
B.Sc.-II 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.

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

			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. Inclusive language: Use gender-neutral language when describing plant structure and development.	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.
			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.

						implications.	

DEPARTMENT OF BOTANY

Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values

Name of the Course	Title of Paper	Sem.	Name of the Unit	Details of Cross Cutting Issues relevant with			
				Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
B.Sc.-II 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.

			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. Representation: Highlight contributions of female scientists in understanding enzyme function 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 and ecosystems.	Accurate representation: Accurately represent enzyme function and nitrogen metabolism in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.	Appreciation for nature: Foster appreciation for the complexity of enzyme function and nitrogen metabolism. Responsible stewardship: Encourage responsible stewardship of 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 A. S. C. COLLEGE ICHALKARANJI

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

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI								
Department of Botany (B.Sc. III)								
Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values								
Sr. No.	Name of the Course	Title of Paper	Sem.	Name of the Unit	Details of Cross Cutting Issues relevant with			
					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 plant life; relif of suffering; Mendelian gentics to improves human life and society, while minimizing potenital risks and harms

DATTAJIRAO KADAM A. S. C. COLLEGE ICHALKARANJI

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

				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 is essential	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, an

								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 Microbiology, 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	1. Responsible research practices 2. Biosafety and biosecurity: 3. Informed consent: 4. Confidentiality and data protection:	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	1. Responsible research practices 2. Biosafety and biosecurity: 3. Informed consent: 4. Confidentiality and data protection:	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 Techniques 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 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

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

4	B.Sc. III (2020-2023)	Paper- XII DSE–E28 Horticulture 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 Advocacy	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	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

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

				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 DSE –F25 Plant Biochemistry and Molecular Biology	VI	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,Greenhouse 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 Sensitivity, Agricultural and Environmental 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, Justice for Equity,

				(deoxyribonucleic acid) and RNA (ribonucleic acid).	Studies, Genetic Adaptation, Genetic Diversity		Education and Knowledge Sharing
B.Sc. III (2020-2023)	Paper- XIV DSE –F26 Bioinformatics, 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, Conservation Genomics	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

					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 these plant-based	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

					resources.			
7	B.Sc. III (2020-2023)	Paper- XV DSE –F27 Plant Biotechnology and Paleobotany	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	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

					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

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

				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 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,Confidentiality, Integrity and Honesty	Holistic Care, Respect for Nature, Cultural Heritage and Tradition, Empowerment and Autonomy, Compassion and Empathy,

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

				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.

				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 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.

DATTAJIRAO KADAM A. S. C. COLLEGE ICHALKARANJI

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

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI								
DEPARTMENT OF BOTANY 2018-2022								
Details of Cross Details of Cross Cutting Issues relevant with Gender Awarenesss, Environmental Awarenesss, Professional Ethics and Human Values								
Sr. No.	**Name of the Course**	**Semester**	**Title of paper**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awarenesss	**Environmental Awarenesss**	**Professional Ethics**	**Human Values**
1	B.Sc.-I (2018-19 - 2020-21)	I	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
				2b. Fungi	influences vulnerability	Cycles of Life and Death, Ecological Identity	Cultural sensitivity and awareness	biosecurity, human rights, social justice, and equity

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

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

				2. Ecosystem and phytogeography 2a. Ecosystem	Representation, equity	Sustinabilty, impact assessment,	ethical guidelines, sustainable practice	Cultural values, environmental stewardship, public awarenesss
				2b. Biogeochemical cycle	Representation, equity	Impact of human activity, sustainability, ecosystem health	ethical guidelines, sustainable practice	Cultural perspectives, stewardship, educational goals
		II	Paper IV: Plant Taxonomy	1 Introductory Taxonomy,ICBN , Botanical garden 1a. Introduction	Representation, equity	Biodiversity, conservation status, impact of human activities	Ethical claiification. Respectful naming	Cultural significance, environmental stewardship, educational outreach
				1b. Herbarium , Botanical garden	Representation, equity	Biodiversity, conservation practice, impact of human activities	ethical guidelines, sustainable practice	Cultural significance, environmental stewardship, public awarenesss
				2b Study of angipspermic families	Representation, equity	Biodiversity, conservation practice, impact of human activities	ethical guidelines, sustainable practice	Cultural significance, environmental stewardship, public awarenesss

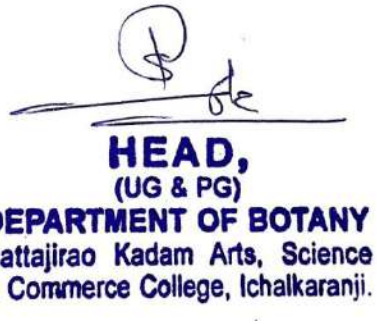
DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI								
DEPARTMENT OF BOTANY								
Details of Cross Details of Cross Cutting Issues relevant with Gender Awarenesss, Environmental Awarenesss, Professional Ethics and Human Values								
Sr. No.	**Name of the Course**	**Semester**	**Title of paper**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
1	B.Sc.-I (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, Empowerment Opportunities	eco-friendly alternative, promote sustainable agriculture, mitigate climate change	Cultural sensitivity and awareness	improve human well-being, health, and nutrition

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

		I	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,Minimizing 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,Chemical Management,Green Chromatography	Ethical Use of Chemicals,Transparency and Reproducibility	use of personal protective equipment (PPE), proper handling of chemicals, and adherence to safety protocols
1	B.Sc.-I (2021-22)	II	Paper III: Mycology, Phytopathology 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
				1.2 Lichen	Representation, equity	Conservation and Protection, Sustainable Practices	Respect for Ecosystems	Ethical Considerations,ultural 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.
		II	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,	Representation, equity	Conservation, climate change , ecosystem services	Cultural sensitivity and awareness	cultural significance, educational value and conservation ethics



	DEPARTMENT OF BOTANY **2019-2022**							
	Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness,Environmental Awareness,Professional Ethics and Human Values							
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
	B.Sc.-II Botany (2019-2022)	Paper V Embryology of Angiosperms	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.b Pollination and Fertilization	Equal opportunities: Ensure equal access to education and research opportunities in plant	Sustainability: Promote sustainable practices in agriculture and horticulture to protect pollinators and plant diversity.	Responsible research: Conduct research on plant reproduction with consideration	Responsible stewardship: Encourage responsible stewardship of the natural world and promote sustainable 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. Representation: Highlight contributions of female scientists in understanding plant embryology and reproduction.	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 assumptions.	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.

				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 implications.	Responsible innovation: Encourage responsible innovation in agriculture and biotechnology, considering ethical implications.
	DEPARTMENT OF BOTANY							
	Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness,Environmental Awareness,Professional Ethics and Human Values							
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
	B.Sc.-II Botany (2019-2022)	Paper VI Plant Physiology	III	1.a Plant Water Relationship	Inclusive language: Use gender-neutral language when describing plant water relationships and mineral nutrition. Representation: Highlight contributions	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,	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.

					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 language: Use gender-neutral language when describing plant photosynthesis, growth, and development. Representation: Highlight contributions of female scientists in understanding plant photosynthesis and development.	Ecological significance: Emphasize the crucial role of plant photosynthesis in supporting life on Earth. Climate change: Discuss the impact of climate change on plant growth and development.	Accurate representation: Accurately represent plant photosynthesis, growth, 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 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 as reducing waste and conserving resources.	Responsible research: Conduct research on plant photosynthesis, growth, and development with consideration for environmental and social	food security: Emphasize the importance of understanding plant photosynthesis, growth, and development for global food security.

							implications.	
	DEPARTMENT OF BOTANY							
	Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness,Environmental Awareness,Professional Ethics and Human Values							
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
	B.Sc.-II 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. 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. Inclusive language: Use gender-neutral language when describing plant structure and development.	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.

				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.
	DEPARTMENT OF BOTANY							
	Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness,Environmental Awareness,Professional Ethics and Human Values							
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
	B.Sc.-II Botany (2019-2022)	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	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	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.

					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 representation: 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

					Representation: 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.

HEAD,
(UG & PG)
DEPARTMENT OF BOTANY
Dattajirao Kadam Arts, Science
& Commerce College, Ichalkaranji

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI								
DEPARTMENT OF Botany (B.Sc. III) 2018-2023								
Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness, Environmental Awareness, Professional Ethics and Human Values								
Sr. No.	**Name of the Course**	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					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 plant 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

					is essential			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 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	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.sharing mechanisms.

2	B.Sc. III (2020-2023)	Paper-XDSE –E26 Microbiology, 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	1. Responsible research practices 2. Biosafety and biosecurity: 3. Informed consent: 4. Confidentiality and data protection:	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	1. Responsible research practices 2. Biosafety and biosecurity: 3. Informed consent: 4. Confidentiality and data protection:	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 Techniques 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 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 Horticulture 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 Advocacy	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	Diverse Perspectives and Innovations, Equitable Opportunities, Addressing Historical Imbalances, Improved Collaboration and Productivity, Educational Access, Career	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 Communities, Ethical Plant Sourcing	Respect for Nature, Commitment to Sustainability, Ethical Responsibility, Empathy and Compassion, Education and Knowledge Sharing

					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 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 DSE –F25 Plant Biochemistry and Molecular Biology	VI	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,Greenhouse 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 Sensitivity, Agricultural and Environmental 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 (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 (2020-2023)	Paper- XIV DSE –F26 Bioinformatics, 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

				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 these plant-based resources.	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
				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	Sustainable Practices, Water Conservation, Biodiversity, Waste Reductio, Climate Change Mitigation, Education and Advocacy, Soil Health, Conservation	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

					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 (2020-2023)	Paper- XV DSE –F27 Plant Biotechnology and Paleobotany	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

					policy development.	Impact, Public Engagement		
				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 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,Confidentiality, 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.

				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 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.

9	B.Sc. III (2018-2020)	Paper- XI Biology of Non Vascular plants and paleobotany	V	Unit 1: Algae	Gender awareness means recognizing that people of all genders use skincare and wellness products. Algae-based products should be formulated and marketed in a way that is inclusive and respectful of all identities.	Algae, which includes a diverse range of photosynthetic organisms such as microalgae and macroalgae, plays a crucial role in environmental sustainability and has significant potential in various industries, including cosmetics, nutrition, and biofuels.	In the context of algae use within industries such as cosmetics, nutrition, and pharmaceuticals, professional ethics involves adhering to principles that ensure responsible, transparent, and respectful practices.	lgae, such as spirulina and chlorella, are rich in nutrients and have been recognized for their health benefits. They are a source of protein, vitamins, and essential fatty acids. Their use in dietary supplements and functional foods supports values related to health and well-being by providing nutritious options and promoting healthier lifestyles.

				Unit 2: Fungi	Fungi, including mushrooms and other fungal organisms, are increasingly recognized for their health and cosmetic benefits. When integrating fungi into skincare and wellness products, gender awareness involves ensuring inclusivity and sensitivity to diverse gender identities and expressions.	ungi, including mushrooms and other fungal organisms, offer significant environmental benefits and opportunities for sustainability. Their role in ecosystems and their potential applications in various industries highlight their importance in promoting environmental awareness.	Many professionals, especially those in fields like environmental science, forestry, and agriculture, must understand and respect the role of fungi in ecosystems. Fungi are crucial for nutrient cycling, soil health, and ecosystem stability. Ethical considerations might involve sustainable practices that protect fungal biodiversity and avoid disrupting natural habitats.	Fungi play a crucial role in ecosystems by decomposing organic matter, recycling nutrients, and forming symbiotic relationships with plants. This supports values related to environmental conservation and sustainability. Protecting fungal habitats and ensuring sustainable practices in the collection and use of fungi are vital for maintaining ecological balance.

				Unit 3: Bryophytes	Bryophytes, including mosses, liverworts, and hornworts, are non-vascular plants that are gaining attention for their ecological benefits and potential applications in skincare and wellness. Integrating bryophytes into these fields with gender awareness involves ensuring inclusivity and sensitivity to diverse gender identities and expressions.	Bryophytes, which include mosses, liverworts, and hornworts, are small but ecologically significant plants that play an essential role in various environmental processes. Their incorporation into practices and products with environmental awareness involves recognizing their ecological benefits and promoting sustainable use	Bryophytes are often indicators of environmental health and can be sensitive to habitat changes. Professionals involved in land management, conservation, and environmental impact assessments need to approach their work with a strong ethical commitment to preserving bryophyte habitats.	Bryophytes are crucial for maintaining ecological balance. They help in soil formation, moisture retention, and as indicators of environmental health. Protecting bryophyte habitats supports values related to environmental conservation and sustainability. Their sensitivity to environmental changes makes them valuable for monitoring ecosystem health and assessing the impacts of climate change.

				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
10	B.Sc. III (2018-2020)	Paper- X Genetics and Analytical Techniques in plant science.	V	Unit 1: Sex Chromosomes, Determination and Population Genetices	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
				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	- Address complex issues with multifaceted ethical approaches - Promote consistency and coherence in professional ethics - Encourage ongoing refinement and evolution of	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 recombination frequency and disrtibution	ethical principle	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: Variation in chromosomes number and structure	gender identity exists beyond the binary male/ female; Gender expression and identity can vary widely; respecting and affirming indiviuals self iddentifed gender is essential	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: Analytical techniques in plant science	Analytical techniques in plant science are methods used to study plant structures, functions, and processes. These techniques are essential for understanding plant biology, improving crop performance, and addressing agricultural challenges.	Sustainable Laboratory Practices,Minimizing Environmental Impact,Green Technologies	Ethical Use of Samples, Transparency and Replication	Health and Safety,Ethical Considerations in Research
11	B.Sc. III (2018-2020)	Paper- XI Fundamental of Plant Physiology and Ecology	V	Unit 1: Mineral Nutrition and Nitrogen Metabolisum	Mineral Nutrition and Nitrogen Metabolism in plants, when viewed through the lens of gender awareness, intersect in important ways, particularly in agricultural research, crop management, and policy development.	Essential Nutrients, Soil Health, Fertilization, Environmental Impact, Soil Degradation, Atmospheric Nitrogen Fixation, Nitrogen Use Efficiency	Integrity in Recommendations and Practices, Environmental Responsibility, Public Health Considerations, Ethical Research and DevelopmentProfessional Competence,	Responsibility, Environmental Stewardship, Integrity, Honesty in Practices, Respect for Nature, Biodiversity Protection, Accountability, Empathy,

				Unit 2: Photosynthesis and Respiration	Inclusive language: Use gender-neutral language when describing plant photosynthesis, growth, and development.; Inclusive language: Use gender-neutral language when describing enzymes and nitrogen metabolism. Representation: Highlight contributions of female scientists in understanding enzyme function and nitrogen metabolism. Representation: Highlight contributions of female scientists in understanding plant photosynthesis and development.	Ecological significance: Emphasize the crucial role of plant photosynthesis in supporting life on Earth.; Ecological significance: Emphasize the importance of enzymes and nitrogen metabolism in ecosystem balance. Conservation: Highlight the impact of human activities on nitrogen cycles and ecosystems.	Accurate representation: Accurately represent plant photosynthesis, growth, and development in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumptions.; Accurate representation: Accurately represent enzyme function and nitrogen metabolism in research and teaching. Objectivity: Approach research and teaching with objectivity, avoiding bias and assumpt	Appreciation for nature: Foster appreciation for the complexity and beauty of plant growth and development. Responsible stewardship: Encourage responsible stewardship of plant resources for sustainable development.; Appreciation for nature: Foster appreciation for the complexity of enzyme function and nitrogen metabolism. Responsible stewardship: Encourage responsible stewardship of nitrogen resources for sustainable development.

				Unit 3: Population ecology	Fostering inclusive communication; Supporting indigenous women's knowledge; Challenging gender stereotypes; Community engagement and participation	Respect for non-human life:; Precautionary principle; Sustainability and conservation; Ecological integrity;	Objectivity and rigor; Transparency and reproducibility; Responsible data management; Collaboration and communication	Climate change mitigation and adaptation; Economic benefits and resource valuation; Human-wildlife conflict mitigation; Human health and disease ecology
				Unit 4: Ecology	Policy and AdvocacyEnvironmental Impact, Vulnerability and Resilience, Access and Equity, Gendered Perspectives	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

12	B.Sc. III (2018-2020)	Paper- XII Plant Biochemistry	V	Unit 1: Carbohydrates Metabolism	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,Greenhouse 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 Sensitivity, Agricultural and Environmental Impact
				Unit 2: Lipid Metabolism	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: Protein Metabolisum	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 and gender awareness intersect in various important ways, particularly in the context of research, healthcare, and education.	Biodiversity Monitoring, Pollution Detection and Management, Genetically Engineered Organisms, Microbial Bioremediation, Gene Expression Studies, Genetic Adaptation, Genetic Diversity	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, Education and Knowledge Sharing

13	B.Sc. III (2018-2020)	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 plant reproduction	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 development;	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	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. III (2018-2020)	Paper- XIV Microbiology and Plant Pathology	VI	Unit 1: Microbiolgy	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	1. Responsible research practices 2. Biosafety and biosecurity: 3. Informed consent: 4. Confidentiality and data protection:	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: Microbial Genetics	Microbial Genetics is the study of the genetic makeup and processes of microorganisms, including bacteria, viruses, fungi, and protists.	Intersection of microbial genetics and environmental awareness is crucial for understanding how microbes interact with their environments and how environmental factors influence microbial behavior, diversity, and genetic traits. Integrating environmental considerations into microbial genetics research can enhance our understanding of microbial ecology, improve environmental practices, and promote sustainability.	The intersection of microbial genetics and professional ethics is crucial for ensuring that research and applications in this field are conducted responsibly and with integrity. Microbial genetics, which involves the study of the genetic material of microorganisms and how it influences their behavior and functions, raises several ethical considerations that must be addressed to uphold scientific and professional standards.	The study of microbial genetics intersects with human values in significant ways, as it involves ethical considerations, societal impacts, and the broader implications for human health and the environment. Understanding these intersections helps ensure that advances in microbial genetics are conducted responsibly and in alignment with societal norms and values.

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

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

15	B.Sc. III (2018-2020)	Paper- XV Plant breeding, Biostatistics, Ethnobotany and Horticulture	VI	Unit 1: Plant Improvement	Plant improvements—encompassing areas like crop breeding, genetic modification, and sustainable agricultural practices—can benefit from integrating gender awareness in various ways.	Plant diseases can affect entire ecosystems by disrupting plant communities, altering nutrient cycles, and impacting wildlife. Studying plant diseases through an environmental lens helps understand these broader ecological impacts.	Integrating environmental awareness into plant improvement efforts is crucial for developing sustainable agricultural practices and enhancing ecosystem health. Plant improvement, which involves breeding and genetic modification to enhance crop traits such as yield, disease resistance, and stress tolerance, must be approached with an understanding of environmental impacts and sustainability.	The study and practice of plant improvements, including breeding and biotechnology, intersect with human values in several important ways. Plant improvements can significantly impact food security, environmental sustainability, economic stability, and cultural practices.

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

					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. III (2018-2020)	Paper- XVI Molecular Biology and Biotechnology	VI	Unit 1: Nucleic Acid: Carrier of genetic information	Nucleic Acids and gender awareness intersect in various important ways, particularly in the context of research, healthcare, and education.	Biodiversity Monitoring, Pollution Detection and Management, Genetically Engineered Organisms, Microbial Bioremediation, Gene Expression Studies, Genetic Adaptation, Genetic Diversity	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, Education and Knowledge Sharing
				Unit 2: Recombinant DNA Technology	Recombinant DNA Technology and gender awareness intersect in important ways, especially in the contexts 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

				Unit 3: Genetic Engineering	Sex Determination, Medical Applications, Ethical Concerns, Societal Impact, Current Research and Developments	Preservation of Endangered Species, Environmental Conservation, Potential Risks and Concerns, Biodiversity Loss	Autonomy, Beneficence, Informed Consent, Respect for Privacy, Justice, Honest Communication	Enhancement vs. Therapy, Beneficence and Well-being, Health and Improvement, Integrity and Respect for Nature
				Unit 4: 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

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

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

M.Sc. I

DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI

POST GRADUATE DEPARTMENT OF BOTANY M. Sc. I (2022-23)

Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness,Environmental Awareness,Professional Ethics and Human Values

Sr. No.	Name of the Course	Title of Paper	Sem.	Name of the Unit	Details of Cross Cutting Issues relevant with			
					Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
		Paper I Biology and		**1. General Character of Fungi**	1. Inclusive language: Use gender-neutral language when describing fungi and their roles. 2. Representation: Highlight contributions of female mycologists (fungi scientists) in understanding fungi.	1. Ecological significance: Emphasize the importance of fungi in ecosystem balance, decomposition, and nutrient cycling. 2. Conservation: Highlight the impact of human activities on fungal diversity and ecosystems.	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.
				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.	1. Conservation: Highlight the impact of human activities on fungal diversity and ecosystems. 2. Sustainability: Discuss sustainable practices for managing fungal diversity and promoting ecological integrity.	1. Accurate documentation: Ensure accurate documentation and reporting of fungal diversity. 2. Objective research: Approach research on fungal diversity with objectivity, avoiding bias and assumptions.	1. Appreciation for nature: Foster appreciation for the fascinating world of fungi and their importance in ecosystems. 2. Responsible stewardship: Encourage responsible stewardship of fungal diversity for sustainable development.

DATTAJIRAO KADAM A. S. & C. COLLEGE ICHALKARANJI

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

1	M.Sc.-I Botany	Diversity of Fungi, Algae and Bryophytes	I	**3. Algae**	1. Representation: Highlight contributions of female phycologists (algae scientists) in understanding algae. 2. Equal opportunities: Ensure equal access to education and career opportunities in phycology.	1. Ecological significance: Emphasize the importance of algae in aquatic ecosystems and global carbon cycling. 2. Conservation: Highlight the impact of human activities on algal diversity and ecosystems.	1. Accurate identification: Ensure accurate identification and classification of algae. 2. Objective research: Approach research on algae with objectivity, avoiding bias and assumptions.	1. Appreciation for nature: Foster appreciation for the fascinating world of algae and their importance in ecosystems. 2. Responsible stewardship: Encourage responsible stewardship of algal resources for sustainable development.
				4. Bryophytes	1. Inclusive language: Use gender-neutral language when describing bryophytes and their roles. 2. Representation: Highlight contributions of female bryologists in understanding bryophytes.	1. Ecological significance: Emphasize the importance of bryophytes in ecosystem balance, soil formation, and water cycling. 2. Conservation: Highlight the impact of human activities on bryophyte diversity and ecosystems.	1. Accurate identification: Ensure accurate identification and classification of bryophytes. 2. Objective research: Approach research on bryophytes with objectivity, avoiding bias and assumptions.	1. Responsible stewardship: Encourage responsible stewardship of bryophyte habitats for sustainable development. 2. Curiosity and wonder: Inspire curiosity and wonder about the biology and ecology of bryophytes.
Sr. No.	**Name of the Course**	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**

1	M.Sc.-I Botany	Paper II Biology and Diversity of Pteridophytes,	I	**1. Classification of Pteridophytes**	1. Inclusive language: Use gender-neutral language when describing pteridophytes and their classification. 2. Representation: Highlight contributions of female pteridologists in understanding pteridophyte diversity.	1. Ecological significance: Emphasize the importance of pteridophytes in ecosystem balance, soil formation, and water cycling. 2. Conservation: Highlight the impact of human activities on pteridophyte diversity and ecosystems.	1. Accurate classification: Ensure accurate classification and identification of pteridophytes. 2. Objective research: Approach research on pteridophytes with objectivity, avoiding bias and assumptions.	1. Appreciation for nature: Foster appreciation for the fascinating world of pteridophytes and their importance in ecosystems. 2. Responsible stewardship: Encourage responsible stewardship of pteridophyte habitats for sustainable development.
				2. Classification of Gymnosperms	1. Representation: Highlight contributions of female botanists in understanding gymnosperm diversity. 2. Equal opportunities: Ensure equal access to education and career opportunities in botany.	1. Ecological significance: Emphasize the importance of gymnosperms in ecosystem balance, soil formation, and water cycling. 2. Conservation: Highlight the impact of human activities on gymnosperm diversity and ecosystems.	1. Objective research: Approach research on gymnosperms with objectivity, avoiding bias and assumptions. 2. Responsible application: Promote responsible application of gymnosperm knowledge, considering environmental and social implications.	1. Responsible stewardship: Encourage responsible stewardship of gymnosperm habitats for sustainable development. 2. Curiosity and wonder: Inspire curiosity and wonder about the biology and ecology of gymnosperms.

		Gymnosperms and Palarobotany		**3. Morphology, Anatomy and Evolutionary trends in Palaeobotany**	1. Representation: Highlight contributions of female paleobotanists in understanding plant evolution. 2. Equal opportunities: Ensure equal access to education and career opportunities in paleobotany.	1. Conservation: Highlight the impact of human activities on plant diversity and ecosystems. 2. Sustainability: Discuss sustainable practices for managing plant resources and promoting ecological integrity.	1. Accurate interpretation: Ensure accurate interpretation of fossil evidence and plant morphology. 2. Objective research: Approach research on plant evolution with objectivity, avoiding bias and assumptions.	1. Curiosity and wonder: Inspire curiosity and wonder about the evolution of plant diversity. 2. Responsible stewardship: Encourage responsible stewardship of plant resources for sustainable development.
				4. Study of geological time scale.	1. Inclusive language: Use gender-neutral language when describing geological concepts. 2. Representation: Highlight contributions of female geologists in understanding Earth's history.	1. Sustainability: Discuss sustainable practices for managing Earth's resources and promoting ecological integrity. 2.Ecological significance: Emphasize the importance of understanding Earth's history in the context of environmental change.	1. Objective research: Approach research on Earth's history with objectivity, avoiding bias and assumptions. 2. Responsible application: Promote responsible application of geological knowledge, considering environmental and social implications.	1. Responsible stewardship: Encourage responsible stewardship of Earth's resources for sustainable development. 2.Appreciation for Earth's history: Foster appreciation for the vast and complex history of our planet.
Sr. No.	**Name of the Course**	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					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.

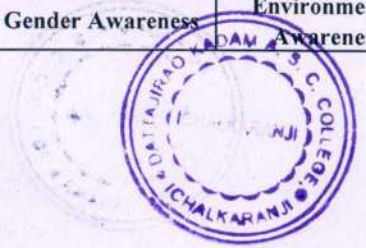
	M.Sc.-I Botany	PAPER-III (CC-103): TOOLS AND TECHNIQUES	I	**Separation Techniques, Chromatographic Techniques, Electrophoretic Techniques**	1. Inclusive language: Use gender-neutral language in scientific writing and laboratory settings.	Sustainable practices: Implement sustainable practices in laboratory 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.
				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 in shaping personal behavior and societal norms.

	M.Sc.-I Botany	BIODIVERSITY: CONSERVATION AND UTILISATION	I	**Principles of Biodiversity Conservation**	**Addressing Gendered Impacts:** Recognizing and addressing how environmental issues and conservation efforts differently impact various genders.	**Community Engagement:** Engaging communities in conservation efforts and raising awareness about the importance of protecting biodiversity.	**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 Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
				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.

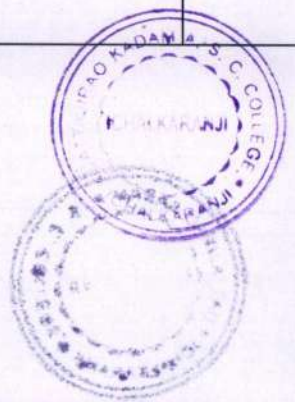
	M.Sc.-I Botany	Paper-V (CC-201): Angiosperm Systematics	II	**Evolutionary concepts, plant speciation, reproductive isolating mechanisms**	**Equitable Opportunities**: Ensuring equal opportunities for all genders in research funding, leadership roles, and academic positions helps balance contributions 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.
				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 families and their importance in human life.
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**

				1.History of plant dis	Ensure equal access to funding, training, and career advancement for all genders in plant pathology.	Assess the environmental impact of disease control measures and strive to mitigate negative effects on ecosystems.	Properly attribute and cite sources of knowledge and discoveries in plant disease research.	Use plant disease knowledge to support conservation efforts, protecting both agricultural crops and natural plant communities.
				2.Introductory Virol	Gender equality in the workplace ensures that safety protocols and protective measures are equally applied to all employees, regardless of gender.	Implementing environmentally friendly practices reduces pollution and the risk of diseases related to environmental degradation	Patients must be informed about the nature of their viral infections and treatment options.	Conducting research and reporting results honestly and ethically.
	M.Sc.-I Botany	Paper-VI (CC-202): Plant Pathology	II	**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.	**Non-Discrimination:** Providing care without bias.	Values such as empathy, respect, and integrity are fundamental in healthcare.
				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 and the environment in the context of disease prevention and management.
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**



Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

	M.Sc.-I Botany	PAPER-VII (CC-203): PLANT STRUCTURE DEVELOPMENT AND REPRODUCTION	II	**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.	Understanding gametophytes helps in the conservation of 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.
				2.Gametogenesis, fertilization and early development, Polyembryony	Ensuring equal opportunities in research and education for all genders promotes a diverse and comprehensive understanding of reproductive biology and related fields.	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.
				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.	Valuing the complexity and beauty of plant life fosters a deeper appreciation for nature and drives efforts to study and protect plant species and their environments.



Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

				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.	Giving appropriate credit to collaborators and acknowledging their contributions in publications and presentations reflects ethical research practices.	Applying knowledge from palynology to promote sustainable environmental practices and conservation efforts supports the well-being of both current and future generations.
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
	M.Sc.-I Botany	Paper-VIII (CC-204): Cell and	II	**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 cell biology to improve human health, develop treatments for diseases, and enhance overall quality of life reflects a commitment to human welfare and well-being.
				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.

	Botany	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.

DATTAJIRAO KADAM A. S. C. COLLEGE ICHALKARANJI

HEAD,
(UG & PG)
EPARTMENT OF BOTAN
ttajirao Kadam Arts, Scie
mmerce College, Ichalkara

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

M.Sc. II

DATTAJIRAO KADAM ARTS,SCIENCE AND COMMEREC COLLEGE, ICHALKARANJI

POST GRADUATE DEPARTMENT OF BOTANY M. Sc. II (2020-23)

Details of Cross Details of Cross Cutting Issues relevant with Gender Awareness,Environmental Awareness,Professional Ethics and Human Values

Sr. No.	Name of the Course	Title of Paper	Sem.	Name of the Unit	Details of Cross Cutting Issues relevant with			
					Gender Awareness	Environmental Awareness	Professional Ethics	Human Values
1	M.Sc.-II Botany	CC301 Cytogenetics and crop improvement	III	**1. Cytology**	Sex Chromosomes and Cellular Studies, Hormonal Influences, Cellular Research and Gender Bias, Educational and Professional Context	Cellular Response to Environmental Stressors, Biomonitoring and Environmental Health, Ecotoxicology, Cellular Adaptation and Evolution, Bioremediation	Patient Confidentiality, Accuracy and Integrity, Informed Consent, Competence and Continuing Education	Compassion, Integrity, Respect, Responsibility
				2. Genetics of Prokaryotes and Eukaryotes	Sexual Reproduction, Sex Chromosomes, Sex Determination, Binary Fission and Genetic Exchange, Plasmids and Sex , Factors, Evolutionary and Ecological Aspects	Environmental Stress Responses, Horizontal Gene Transfer, Gene Expression and Environmental Sensing, Stress , Symbiosis and Environmental Interactions, Responses and Adaptation,	Biosafety, Biosecurity, Gene Editing and Synthetic Biology, Human Genetic Research, Genetic Modification and Editing, GMOs in AgricultureGene Therapy,	Safety and Risk Management, Biosafety and Biosecurity, Scientific Integrity, Human Health and Well-being, Privacy and Confidentiality
				3. Population and evolutionary genetics	Sex Chromosomes, Sex Determination Systems, Sexual Dimorphism, Allele Frequencies, Sexual Selection, Sex Linkage and Evolution	Natural Selection and Adaptation, Genetic Variation, Gene Flow and Migration, Environmental Stress and Genetic Changes	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

DATTAJIRAO KADAM A. S. C. COLLEGE ICHALKARANJI

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

				4. Classical and modern methods of crop breeding and improvement	Molecular Marker-Assisted Selection, Genomic Selection, Role of Women in Agriculture, Education and Training	Traditional Selection, Hybridization, Environmental Resilience, Precision Agriculture, Climate Change Adaptation	Respect for Indigenous 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
Sr. No.	**Name of the Course**	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
				1. Introduction of Biotechnology	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

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji

1	M.Sc.-II Botany	DSE 304 Biotechnology and genetic engineering	III	**2. Microbial biotechnology**	Representation and Participation,Equal Opportunities,Diverse Perspectives,Addressing Bias and Discrimination	Bioremediation,Waste Management,Climate Change Mitigation,Environmental Monitoring	Ethical Conduct in Research and Development, Risk Assessment and Management,Sustainable Practices,Public Engagement and Communication	Beneficial Applications,Ethical Conduct,Sustainability and Environmental Stewardship,Health and Well-being
				3. Recombinant DNA technology	Recombinant DNA Technology and gender awareness intersect in important ways, especially in the contexts 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
				4. Genomics	Gender Bias in Research,Tailored Treatments,Genetic Diseases and Conditions,Educational and Professional Opportunities	Biodiversity and Conservation,Biodiversity and Conservation,Climate Change Impact,Sustainable Agriculture	Genetic Editing and Modification,Responsibility to Future Generations,Transparency and Accountability,Cultural Sensitivity	Equity and Fairness,Beneficence and Non-Maleficence,Transparency and Accountability,Cultural Sensitivity and Respect
Sr. No.	**Name of the**	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental**	**Professional Ethics**	**Human Values**

				1. General features of Fungi	1. Inclusive language: Use gender-neutral language when describing fungi and their roles. 2. Representation: Highlight contributions of female mycologists (fungi scientists) in understanding fungi.	1. Ecological significance: Emphasize the importance of fungi in ecosystem balance, decomposition, and nutrient cycling. 2. Conservation: Highlight the impact of human activities on fungal diversity and ecosystems.	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.Sc.-I Botany	CCS-302.2 Taxonomy of fungi	III	**2. Criterias used in classification of Fungi**	Morphological Characteristics,Reproductive Structures,Biochemical Properties,Growth Patterns	Ecological Role,Seasonal and Environmental Adaptations,Interaction with Other Organisms,Reproductive 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

				3. Criterias used in classification of Fungi	Morphological Characteristics,Reproductive Structures,Biochemical Properties,Growth Patterns	Ecological Role,Seasonal and Environmental Adaptations,Interaction with Other Organisms,Reproductive 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,Representation 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,Environmental Stewardship,Collaboration and Teamwork
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Gender Awareness**	**Environmental Awareness**	**Professional Ethics**	**Human Values**
				1. Pinciples of	Equal Opportunities and	Minimizing Chemical	Respect for Intellectual	Community
				2. Role of enzymes and toxins in disease development	Health and Safety Community Engagement Research Collaboration Field Practices and Application	Sustainable Disease Management Practices Impact of Enzymes and Toxins on Ecosystems	Public Trust and Accountability Safety and Risk Management	Respect for Human Health and Well-being,Equity and Fairness,Transparency and Honesty,Ethical Research and Development
	M.Sc.-II Botany	CCS-303.2 Integrated disease management	III	**3. Physiology and biochemestry of host pathogen interactions**	Research Design and Data Collection,Gender-Sensitive Training,Workplace and Professional Development,Equitable Health Interventions	Host Defense Mechanisms,Pathogen Strategies,Environmental Factors Affecting Pathogen Dynamics,Human Activities and Disease Transmission	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,Equitable Distribution,Diverse Representation
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**
	M.Sc.-II Botany	CC401: Plant Physiology and metabolism	IV	**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,Educational Outreach
				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,Interdisciplinary Cooperation
				4. Signal Trasduction and Phytoharmones	Biological Differences,Disease Presentation and Progression	Impact of Environmental Factors,Exposure Assessments,Sustainable Practices	Research Integrity,Respect for Intellectual Property,Environmental Responsibility,Ethical Considerations in Application	Truthfulness,Ethical Treatment of Subjects,Social Responsibility
	Name of the Course	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental Awareness**	**Professional Ethics**	**Human Values**

	M.Sc.-II Botany	DSE 404 Biodiversity: conservation and Utilisation	IV	**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
				2. Principle of biodiversity conservation	Sustainability,Inclusion of Local Communities,Recognizin g Diverse Roles,Community Empowerment	Education and Knowledge,Ecosystem Protection,Integrated Approaches,Communit y Engagement	Protected Areas and Reserves,Restoration and Rehabilitation,Communit y Involvement	Respect for Nature,Cultural Significance,Stewar dship
				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,Preservati on of Traditions
	Name of the	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental**	**Professional Ethics**	**Human Values**
	M.Sc.-II	CCS 402.2		**1. Role of Fungi in Industry**	Biotechnology and Research,Education and Outreach	Bioremediation,Waste Management,Sustainabl e Agriculture	Responsible Research and Development,Biosafety and Risk Management	Sustainability,Healt 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

	M.Sc.-II 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 the	**Title of Paper**	**Sem.**	**Name of the Unit**	**Details of Cross Cutting Issues relevant with**			
					Gender Awareness	**Environmental**	**Professional Ethics**	**Human Values**
	M.Sc.-II Botany	CCS 403.2 Integrated Disease Managemebnt	IV	**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
				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:
				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

HEAD,
(UG & PG)
DEPARTMENT OF BOTANY
Rajaram Tajirao Kadam Arts, Science & Commerce College, Ichalkaranji.

Signature Not Verified
SHAHAJAHAN MEHABUB MANER
Document Certified
Ichalkaranji