

AGI6585 Applications in biotechnology

Level	6
Course Code	AGI6585
Course Title	Applications in biotechnology
Credit value	5
Core/Optional	Core
Course Aim/s	To educate the students in-depth understanding of the principles, practice and key concepts relevant to the <i>application</i> of biotechnology.
Course Learning Outcomes (CLO):	<p>Course Outcomes:</p> <p>At the completion of this course student will be able to,</p> <p>CLO1: Apply different industrial biotechnology methods for improving or replacing existing conventional methods. [PLO1] [PLO2] [PLO3] [PLO4] [PLO5] [PLO6] [PLO7] [PLO8] [PLO9] [PLO10] [PLO11] [PLO12]</p> <p>CLO2: Formulate knowledge to use biotechnology tools in crop improvement. [PLO1] [PLO2] [PLO3] [PLO4] [PLO5] [PLO6] [PLO7] [PLO8] [PLO9] [PLO10] [PLO11] [PLO12]</p> <p>CLO3: Describe the possibility of applying biotechnology in improving farm animal and aquaculture production. [PLO1] [PLO2] [PLO3] [PLO4] [PLO5] [PLO6] [PLO7] [PLO8] [PLO9] [PLO10] [PLO11] [PLO12]</p> <p>CLO4: Identify importance of germplasm collection, exchange and quarantine [PLO7] [PLO8] [PLO9] [PLO10] [PLO11] [PLO12]</p> <p>CLO5: Analyze social and environmental issues related to the biotechnology applications. [PLO7] [PLO8] [PLO9] [PLO10] [PLO11] [PLO12]</p> <p>CLO6: Explain the use of bioinformatics in analyzing biotechnology applications. [PLO10] [PLO11] [PLO12].</p>
Content (Main topics, sub topics)	<p>Outline syllabus:</p> <p>Unit 1: Industrial and Environmental Biotechnology</p> <p style="padding-left: 20px;">Session 1: Microbial Industrial Biotechnology</p> <p style="padding-left: 20px;">Session 2: Enzyme and Fermentation Biotechnology</p> <p style="padding-left: 20px;">Session 3: Environmental Biotechnology – Waste management</p> <p style="padding-left: 20px;">Session 4: Value-added Biotechnological Products from Organic Wastes</p> <p style="padding-left: 20px;">Session 5: Biopesticides</p> <p style="padding-left: 20px;">Session 6: Biofuels</p> <p style="padding-left: 20px;">Session 7: Biofuels - Biogas production</p> <p style="padding-left: 20px;">Session 8: Biofertilizers</p> <p style="padding-left: 20px;">Session 9: Biofertilizers – Composting</p> <p style="padding-left: 20px;">Session 10: Biofertilizers – Vermicomposting</p> <p>Unit 2 – Genetic Improvement of Plants and animal Biotechnology</p> <p style="padding-left: 20px;">Session 11: Modern methods in plant genomics and Breeding</p> <p style="padding-left: 20px;">Session 12: Plant Tissue Culture Techniques and Somaclonal Variations</p> <p style="padding-left: 20px;">Session 13: Overcoming Crossing Barriers using Tissue Culture Techniques</p> <p style="padding-left: 20px;">Session 14: Single Cell and suspension cultures</p> <p style="padding-left: 20px;">Session 15: Protoplast culturing and somatic hybridization</p> <p style="padding-left: 20px;">Session 16: Production and Uses of Haploids</p>

	<p>Session 17: Molecular mapping and tagging of agronomically important traits. Session 18: Marker assisted selection and molecular breeding Session 19: Molecular Pharming/Farming Session 20: Breeding for quality traits Session 21: Nanotechnology and its applications in crop improvement programs Session 22: Germplasm collection, exchange and quarantine Session 23: Biotechnology applications in Aquaculture Session 24: Genetic Engineering and Transgenic Animal Technology Session 25: Animal feed additives</p> <p>Unit 3 - Bioethics, biosafety and Intellectual property rights</p> <p>Session 26: Genetically modified (GM) crops and related issues: Risks and Regulations.</p> <p>Session 27: Biotechnology and biodiversity Session 28: Biosafety applications in biotechnology Session 29: Moral, ethical concerns and intellectual property rights in biotechnology Session 30: Bioinformatics and bioinformatics tools</p>
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