

SWARNIM STARTUP & INNOVATION UNIVERSITY

SWARNIM SCIENCE COLLEGE

VALUE ADDED COURSE (VAC)

Comprehensive Industrial Biotechnology Course - VACIM

Duration: 30 Hours (15 Sessions, 2 Hours Each)

Session	Topic	Content	Duration
Session 1	Introduction to Industrial Biotechnology	Overview of Industrial Biotechnology, Key Concepts, Applications in Industry	2 hours
Session 2	Biochemical Processes and Applications	Basics of Biochemical Processes, Enzyme Technologies, Fermentation and Biotransformations	2 hours
Session 3	Microbial Biotechnology	Role of Microorganisms in Biotechnology, Industrial Microbes, Strain Improvement	2 hours
Session 4	Genetic Engineering and Recombinant DNA Technology	Basics of Genetic Engineering, Gene Cloning, Recombinant Protein Production	2 hours
Session 5	Bioprocess Engineering	Principles of Bioprocess Design, Scale-Up Processes, Bioreactor Design and Operation	2 hours
Session 6	Downstream Processing	Techniques for Product Recovery, Purification Methods, Filtration, and Chromatography	2 hours
Session 7	Biotechnology in Agriculture	Genetic Modification of Crops, Biofertilizers, Biopesticides	2 hours
Session 8	Biotechnology in Medicine	Production of Biopharmaceuticals, Vaccines, Gene Therapy, Monoclonal Antibodies	2 hours
Session 9	Biotechnology in Environmental Protection	Bioremediation, Waste Treatment, Biofuels	2 hours
Session 10	Industrial Enzyme Technology	Enzyme Production, Enzyme Engineering, Applications in Industry	2 hours
Session 11	Biotechnology in Food Industry	Food Fermentation, Probiotics, Enzyme Use in Food Processing	2 hours
Session 12	Regulatory and Ethical Issues	Regulatory Framework for Biotechnological Products, Ethical Considerations	2 hours
Session 13	Emerging Trends in Industrial Biotechnology	Advances in Synthetic Biology, Bioprocess Optimization, Future Trends in Biotechnology	2 hours





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Session 14	Case Studies and Applications	Review of Industrial Biotechnology Case Studies, Real-World Applications	2 hours
Session 15	Review of Content	Review of Key Concepts, Peer Feedback	2 hours

Assessments

- **Participation:** Active participation in discussions, group projects, and interactive sessions.




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