

TOPICS	LECTURES
1. Introduction to Bioprocess Engineering.	1
2. Bioreactors.	1
3. Isolation	1
4. Air and media sterilization	2
5. Preservation and Maintenance of Industrial Microorganisms.	1
6. Kinetic of microbial growth and death.	1
7. Downstream Processing: Introduction	1
8. Removal of microbial cells and solid matter, foam reparation	1
9. precipitation, filtration	1
10. centrifugation, cell disruptions	1
11. liquid-liquid extraction,	1
12. chromatography	1
13. Membrane process, Drying and Crystallization	1
14. Effluent treatment: BOD and COD treatment and disposal of effluents.	1
15. Whole cell Immobilization and their Industrial Applications.	1
16. Use of microbes in mineral beneficiation and oil recovery.	1
17. Acids (citric, acetic),	1
18. Alcohol (ethanol),	1
19. solvents (glycerol, butanol),	1
20. Antibiotics (penicillin), Aminoacids (lysine, glutamic acid)	2
21. Vitamins and Single Cell Protein-algal, fungal and yeast biomass.	1