SRM University
School of Bioengineering
Department of Biotechnology

M. Tech. Biotechnology
I Year/II Semester
BT2110 –Microbial Technology
Total hours: 45

Lesson plan

Units	Hours	Lecture Topics	Reference	Learning Outcomes
I	1-3	Organization and function of prokaryotes, Isolation of industrially important microorganisms from different sources	1,2&4	The basic understanding of prokaryotic cell and its organization, Isolation and characterization of microbes will be discussed
	4-6	Extremophiles and their applications, Characteristics of selected groups of microbes	1,2,3&4	
	7-9	Control of micro organisms- physical and chemical agents, Culture concept and cultural characteristics	1,2&4	
II	9-12	Methods in microbiology- Pure culture techniques, Microbial nutrition and growth principles. Growth measurement techniques	1&4	Microbial culture techniques, preservation, nutrition and growth kinetics will be discussed
	13-16	Isolation of microorganisms from various sources, long term preservation and improvement of cultures. Design and Preparation of Media- fermentation processes	1,4&6	
	17-18	Study of various methods of biomass measurement- Growth curve studies of microbes in Batch culture and continuous culture. Determination ofyield coefficient and Monod's constant	2,4&6	
III	19-21	Industrially important microbial metabolites- Process technology for the production of primary metabolites e.g. enzymes (Amylases, Proteases, Lactases, Pectinase and Lipases)	2,5&6	Industrially important microbial metabolites (primary & secondary)will be

	24-25	baker's yeast, ethanol, citric acid, polysaccharides, nucleosides and bioplastics	2,5&6	discussed
	26-27	Production of secondary metabolites- penicillin, Tetracycline, streptomycin, vitamins etc	2,5&6	
IV	28-29	Applications of microbial metabolites: Pharmaceutical industry, Therapeutics, and Clinical analysis- glucose isomerase, aminopeptidase; amylase, cellulase, penicillin acylase, lipase, oxido-reductase; protease etc. for the production of different types of drugs and drugs intermediates.	2,5&6	Application of microbial metabolites in Pharmaceutical industry, Agriculture and Environmental issues will be discussed
	30-32	Biogenic synthesis of nanoparticles from microbes- mechanism, characterization, and applications.Microbes in environmental management	4,5&6	
	33-36	Biocontrol, Biofertilizers, and biopesticides	1,2,4&5	
V	37-38	Removal of microbial cells- Precipitation, filtration, centrifugation	2,3&6	Downstream process of microbial metabolites will be discussed
	39-42	Cell distruption- extraction and chromatography	4&6	
	43-45	Drying and crystallization	4,5&6	

Text Book:

1. Michael T. Madigan, John M. Martinko, Paul V. Dunlap, and David P. Clark *"Brock Biology of microorganisms",* Prentice Hall, 12th Edition, 2008
2. Michael Pelczar, S. Chan, and Noel R. Krieg *"Microbiology*",McGraw Hill, 7th Edition, 2011
3. Geo Brooks Karen C. Carroll, Janet Butel, and Stephen Morse "*Medical Microbiology", McGraw-Hill Medical, 26th Edition, 2012*

4. Lansing M. Prescott, Donald A. Klein, and John P. Harley, *"Microbiology",* McGraw Hill, 5th Edition, 2002
5. G. Reed, Prescott and Dunn's, *"Industrial Microbiology",* 4th Edition, CBS Publishers, 1987
6. P. E. Stanbury, A. Whitaker, and S. J. Hall, *"Principles of Fermentation Technology", Indian Edition, Hall Books, 2007.*

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