

Punyashlok Ahilyadevi Holkar Solapur University, Solapur



NAAC Accredited-2015
'B' Grade (CGPA 2.62)

Name of the Faculty: Science & Technology

CHOICE BASED CREDIT SYSTEM

Syllabus: Fermentation Technology

(Skill Enhancement Course)

Name of the Course: B. Sc. Part- III (Sem. V)

(Syllabus to be implemented from w.e.f. June 2021)

Enhancement Course (SEC)

Introduction: -

Solapur district is known for the production of fruits like Grapes, Pomegranate and sugarcane. One of the emerging agro based industry is the Fermentation industry. Fermented food products are part and partial of our daily. Recently, farmers have realized this fact and Government has also taken initiatives by relaxing the taxation and certification rules for the Industries. In future large number of expertise is likely to be required in this area. In order to meet this requirement of skilled expertise the **Skill Enhancement Course** in Fermentation Technology is proposed to be started as a part of B Sc. Microbiology course.

Objective of the course

- 1.To provide the knowledge of basic principle of fermentation process, which help students to design, develop and operate industrial level fermentation process.
- 2.To develop skills of the students in the area of downstream processing
- 3.To impart basic knowledge of quality control and good manufacturing practices in industries
4. To equip the students to pursue higher studies.
5. To prepare the student for an eventual job in industry.

The **Skill Enhancement Course** in fermentation Technology provides platform for job opportunities in exciting fields of fermentation industry. This course has to be completed along with the degree course.

B.Sc. III- Microbiology (Semester-V) w. e. f. June 2021

[Credits -4, Total Lectures-60(theory 30+practical 30)]

Title :SEC: Fermentation Technology

SEC	Fermentation Technology	Total30 lectures
UNIT I	Definition and Scope of Industrial Microbiology. Basic Concepts of Fermentations. a) Fermentations Introductions b) Fermenter design - parts & their functions c) Types of fermenter - batch, Continuous, Dual and Multiple d) Design of fermentation media- water, carbon and nitrogen source, Growth factors, precursors, aeration and antifoam agents. e) Factors affecting fermentation process.	05
UNIT II	Selection & Preservation of Industrial microorganisms a) Primary and Secondary Screening b) Strain Improvement c) Scale up of Fermentation d) Preservation of Industrially important microorganisms e) Microbiological assays	05
UNIT III	Specific Fermentations a.Penicillin b.Amylase c.Vinegar d.Vit B 12 Production of SCP,biogas,biofertilizers,biopesticides	11
UNIT IV	1. Recovery of Fermentation product, Criteria for method selection,Methods-Filteration, Centrifugation,Drying, Crystallization, Solvent extraction etc. 2.-Quality control of Health Care Products,Testing for Sterility,Toxicity, Pyrogenesity,Allergy,Catcinogenesity. 3-Good Manufacturing Practices-General requirements,GMP 10-Principles,GMP Categories.	09

SEC	PRACTICAL COURSE	total 30 practical lectures
	1. Sterility testing of dry powder by direct inoculation on Soyabean casein digest medium	
	2. Sterility testing of media	
	3. Bioassay of Vitamin B12	
	4. Bioassay of Penicillin	
	5. Screening of antibiotic producers	
	6. Estimation of alcohol by using K ₂ Cr ₂ O ₇	
	7. Thin layer chromatography	
	8. Demonstration of crude recovery of amylase enzyme	
	9. Immobilization of enzyme by using Sodium alginate.	
	10. Preservation of industrially important microorganisms	

References:

1. Stanbury P.F., Whitaker A., Hall S.J., (1997) Principles of fermentation technology. 2nd ED, Aditya books(P) Ltd, New Delhi.
2. El-mansi E.M.T., Bryce C.F.A., Demain A.L., Allman A.R., (2009) Fermentation microbiology and biotechnology, 2nd ED, CRC Press.
3. Crueger W. and Crueger A. (2003) Biotechnology: A textbook of industrial microbiology, 2nd ED, Panima publishing corporation, New delhi.
4. Bailey J. S. and Bhatia S.C. (2009) Biochemical engineering. Vol – 1&2. CBS publishers & distributors, India.
5. Reed, G. (1981) Prescott and Dunn's Industrial Microbiology. Chapman & Hall.