



# AMITY UNIVERSITY

— UTAR PRADESH —

L	T	P/S	SW/ FW	TOTAL CREDIT UNITS
3	-	-	-	03

**Course Title: ADVANCEMENT IN FOOD BIOTECHNOLOGY**

**Course Code:**

**Credit Units: 03**

**Course Objectives:**

To give a understanding of principles and concepts of biotechnology and to familiarize with techniques and recent advances used in biotechnology- micro-propagation techniques, genetic engineering and gene technology, and their application to improve productivity of food crops and for production of single cell proteins, food flavours, vitamins, etc and regulatory aspects of food biotechnology.

**Pre-requisites:**

Fundamental understanding and knowledge of food science and technology .

**Student Learning Outcomes:**

On completion of the course the student will be able to:

1. explain the role of biotechnology in development of food sector.
2. explain the basic concepts of replication, transcription and translation in prokaryotic and eukaryotic organisms.
3. apply the basic concepts of biochemical engineering in food industry.
4. Describe recent advances in biotechnology.

**Pedagogy for Course Delivery:**

The course pedagogy will include lectures, discussion on applications of the topics covered.

**Course Contents/Syllabus:**

	Weightage (%)
<b>Module I: Introduction</b>	<b>20%</b>
<ul style="list-style-type: none"><li>• Prospectus of biotechnology- definition, scope and applications,</li><li>• Application of Biotechnology in food (Food industries), pharmaceuticals and agriculture,</li></ul>	

<ul style="list-style-type: none"> <li>• Application of biotechnology for food plant waste utilization</li> </ul>	
<b>Module II: Molecular Genetics</b>	<b>20%</b>
<ul style="list-style-type: none"> <li>• Biological role of DNA in cell metabolism,</li> <li>• Molecular genetics i.e. fundamentals of molecular biology with special reference to chemistry and biology and DNA,</li> <li>• Primary, secondary and tertiary structures of DNA</li> </ul>	
<b>Module III: Recombinant Technology</b>	<b>20%</b>
<ul style="list-style-type: none"> <li>• Genetic recombination mechanisms and technique used for improvement in microbial strains.</li> <li>• Recombinant-DNA technology (plasmids and cloning), Expression of foreign genes, Promoters (Enzyme),</li> <li>• Biomass production by using various micro organisms</li> </ul>	
<b>Module IV: Fermentation Technology</b>	<b>20%</b>
<ul style="list-style-type: none"> <li>• Applications of genetical control mechanism in industrial fermentation process,</li> <li>• Induction, manipulation and recombination,</li> <li>• Design and kinetics of fermentors.</li> </ul>	
<b>Module V :Cell Tissue Culture</b>	<b>20%</b>
<ul style="list-style-type: none"> <li>• Cell and tissue culture,</li> <li>• Continuous cultures,</li> <li>• Secondary metabolites synthesis.</li> </ul>	

**Assessment/ Examination Scheme:**

<b>Theory L/T (%)</b>	<b>Lab/Practical/Studio (%)</b>	<b>End Term Examination(%)</b>
<b>100</b>	<b>0</b>	<b>100</b>

**Assessment/ ExaminationScheme:**

	Continuous Assessment/ Internal Assessment				End Term Examination		Total
	CT	S/V/Q	HA	A	EE		TT
Weightage (%)	10	08	07	05	70		100

*Abbreviations: CT – Class Test, S- Seminar, V- Viva, Q- Quiz, HA- Home Assignment, TT- Total Theory, LR- Lab record, WT- Written Test, P – Performance, TP- Total Practical*

The total marks (out of 100) shall be the weighted average of TT and TP in the ratio of theory and lab credit units, say 3:0.

**Text&References:**

- Bains W. 1993. Biotechnology from A to Z. Oxford Univ. Press.
- Crueger W & Crueger A. 2000. Biotechnology: A Textbook of Industrial Microbiology. Madison, USA.
- Gambell CW & Vezina C. 1984. Advances in Biotechnology. Vol. I. Scientific and Engineering Principles.
- Gambell CW & Vezina C. 1984. Advances in Biotechnology. Vol. II. Fuels, Chemicals, Foods and Waste Treatments.
- Gambell CW & Vezina C. 1984. Advances in Biotechnology. Vol. III. Fermentation Products.
- Joshi VK & Pandey A. 2003. Biotechnology Food Fermentation. Vols. I, II. Education Publ.
- Knorr D. 2002. Food Biotechnology. Marcel Dekker.
- Pepler & Perlman. 1979. Microbial Technology. Vol. I. (Microbial Process) Academic Press VII International Biotechnology Symposium (Feb 19-25, 1984) held at New Delhi. Part-I & II