

Programme	Biotechnology	Course Code	BT. 402	Credit Hours	3 (2+1)
Course Title	Food Biotechnology				
Course Introduction					
In this course, students will learn about the beneficial and harmful impact of microorganisms on food and health along with their use in food industry. Moreover, the principles of food preservation and food safety are also covered.					
Learning Outcomes					
By the end of this course, students will be able to:					
<ul style="list-style-type: none"> • Explain the application of biotechnology in food production and processing. • Describe the principles of fermentation and bioprocessing in food technology. • Analyze the impact of genetically modified organisms on food safety and nutrition 					
Course Content					
Theory Unit					
<ul style="list-style-type: none"> • Introduction of food biotechnology • Food composition and importance of food analysis • Food Analysis: Proximate analysis of food components (proteins, lipids, carbohydrates, moisture content, Ash, vitamins, minerals), Food colors, Food additives • Microbial Application in food biotechnology: Probiotics, Food enzymes (introduction and production, applications) • Food spoilage and prevention: Microbial Food spoilage: Factors & control measures, Food preservation techniques • Genetic Modification of Plant Starches for food application • Biotechnological approaches to improve nutritional quality of food • Fermented foods (Background), Food engineering principles • Microbial biotechnology of oil and fats • Microbial biotechnology of dairy products • Microbial biotechnology of meat and meat products • Microbial biotechnology of cereal foods • Microbial biotechnology of food flavors production • Food Safety, Food quality control • Food Marketing principles 					
Practical Unit					
<ul style="list-style-type: none"> • Estimation of moisture content, solid content and ash in food • Estimation of carbohydrates, protein, fat in food • Detection of proteases in milk • Detection of amylases in milk • Determination of specific gravity of sugar • Separation of gluten from wheat flour • Detection of adulterants in food • Detection of adulterants in food • Determination of quality of drinking water 					

- Determination of quality of milk
- Production of yogurt
- Production of cheese
- Detection of yeast and mold in food products

Textbooks and Reading Material

Textbooks

- Food Biotechnology by Ulf Stahl, Ute E.B. Donalies and Elke Nevogit, 2008.
- Food colors, flavors and additives technology by NIIR, National Institute of industrial research, Dehli, India 2007.
- Biotechnology and food processing by Meenakshi Paul, 2007
- Food Biotechnology, edited by K. Shetty et al , 2nd edition, 2006.
- Food Biotechnology by S. C. Bhatia, Woodhead Publishing India Pvt Ltd.
- Food Science and Technology, edited by Geoffrey Campbell-Platt, 2009.
- Textbook of Food Science and Technology by Vijaya Khader, 2016, Published by Directorate of Knowledge Management in Agriculture, Indian Council of Agricultural Research, New Delhi.
- Fundamentals of food Biotechnology, Dyong H.Lee, 1996 Food Chemistry, lab. Manual by Dennis D. Miller, Willey Inter science. , 1998
- Food analysis Manual by Javid Aziz Awan.2000.
- A Food Technology Lab Manual by Rashida Rajuva TA & Joy PP, 2014. Kerala Agricultural University, Pineapple Research Station (Available online)
- Food Analysis Laboratory Manual, Third Edition. Edited by S. Suzanne Nielsen, Purdue University, West Lafayette, IN, USA. Springer International Publishing.

Teaching Learning Strategies

- Class Lecture
- Class Discussions
- Class Tutorials
- Lab Demonstration

Assignments: Types and Number with Calendar

- 1st Quiz in 4th Week of 5 marks
- 2nd Quiz in 10th Week of 5 marks
- 3rd Quiz in 14th Week of 5 marks
- 1st Assignment in 8th Week of 10 marks

Assessment

Sr. No.	Elements	Weightage	Details
1	Midterm Assessment	35%	Written Assessment at the mid-point of the semester.

2	Formative Assessment	25%	Continuous assessment includes: Classroom participation, assignments, presentations, viva voce, attitude and behavior, hands-on-activities, short tests, projects, practical, reflections, readings, quizzes etc.
3	Final Assessment	40%	Written Examination at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.