

Course code	Course Name	L-T-P - Credits	Year of Introduction
FT206	Food_Biotechnology	3-0-0-3	2016
Prerequisite : Nil			
Course Objectives <ul style="list-style-type: none"> To study about molecular biology and enzymes and fermentation in food. To familiarize genetically modified food. 			
Syllabus Introduction - Genetic Engineering- Traditional application – Metabolite -GM Functional Foods Enzymes			
Expected outcome. The students will be able to apply principles of biotechnology in food through molecular biology and fermentation.			
Text Book: <ol style="list-style-type: none"> Joshi,V.K and Singh,R.S, “<i>Food Biotechnology Principles and Practices</i>”, IK International Publishing House Pvt.Ltd Satyanarayana U, “<i>Biotechnology</i>”, Arunavazhan Publishers <i>National Research Council – “Application of Biotechnology to traditional fermented foods”</i>, National Academy Press, Washington,1992. 			
Data Book (Approved for use in the examination):			
References: <ol style="list-style-type: none"> David Latchman, <i>Basic Molecular and Cell Biology</i>, 3rd Edition., BMJ Publishing group,1997. First Indian Reprint 2006. <i>Gene cloning and DNA Analysis- An Introduction-4th Edition</i>, T.A. Brown Publishers, Blackwell Sciences Ltd. UK , 2001. H.S.Chawla, <i>Introduction to plant Biotechnology</i>,2nd Edition , Oxford Publishers and IBH Publishing Company Pvt. Ltd, New Delhi. Lopez G.I.G and Canovas,G.V.B <i>Food Science and Food Biotechnology</i>, , CRC Press,Florida,USA 2003. Joshi .V.K and Pandey <i>Biotechnology : Food Fermentations</i>, Vol 1 and 2, Education Publishers,2002. Lee,B.H Joshi,V.K and Pandey A, <i>Fundamentals of Food Biotechnology</i>, 1999 Rita Singh, <i>Food Biotechnology</i>, Global Vision Publication House, Delhi, 2004. 			
Course Plan			
Module	Contents	Hours	Sem. Exam Marks
I	Introduction to Biotechnology Application of Biotechnology in Food, Pharmaceutical and other Industries. Basics of Molecular Biology – Chemistry and Biology of DNA, RNA and proteins-DNA replication, transcription and translation in prokaryotes and eukaryotes.	7	15%
II	Genetic Engineering Regulation of gene expression in prokaryotes and eukaryotes, Recombinant DNA Technology, Basics of strain improvement techniques, Vectors in Biotechnology, Plant tissue culture,	8	15%

	Animal /Insect cell culture as a tool of biotechnology.		
FIRST INTERNAL EXAMINATION			
III	Traditional Application of Food Biotechnology Fermented Foods: Dairy products, Oriental fermentations, Alcoholic Beverages and food ingredients. Types of fermented foods and importance of food fermentations in food preservation and nutritional enhancement.	6	15%
IV	Production of primary and Secondary Metabolites Process of production of commercially important organic acids-Citric Acid, Lactic Acid, Gluconic Acid, Amino acids. Bioproducts for food industries-SCP, Mushroom. Natural Biopreservatives-Nisin. Development and formulation of novel food products-Probiotic Foods.	8	15%
SECOND INTERNAL EXAMINATION			
V	GM and Functional Foods Nutrogeomics-concepts, working, significance and relevance-Nutraceuticals and Functional Foods. Genetically Modified Foods-Plant and Animal origin. Ethical issues concerning GM Foods, testing for Genetically modified organisms. Current guidelines-production, release and movement of GMO's, labelling and traceability-Biosafety- Public perception of GM foods, GMO Act- 2004	8	20%
VI	Enzymes of Importance in Food Role of immobilized enzymes in food processing-Endogenous enzymes in food quality- colour, texture, flavour and nutritional quality. Application of enzymes in Bakery, Meat, Fruit, Vegetable and Dairy Industries.	5	20%
END SEMESTER EXAM			

QUESTION PAPER PATTERN

Max. marks: 100, Time: 3 hours

The question paper shall consist of three parts

Part A

4 questions uniformly covering modules I and II. Each question carries 10 marks
Students will have to answer any three questions out of 4 (3X10 marks =30 marks)

Part B

4 questions uniformly covering modules III and IV. Each question carries 10 marks
Students will have to answer any three questions out of 4 (3X10 marks =30 marks)

Part C

6 questions uniformly covering modules V and VI. Each question carries 10 marks
Students will have to answer any four questions out of 6 (4X10 marks =40 marks)

Note: In all parts, each question can have a maximum of four sub questions, if needed.