University of Management & Technology
School of Science
Department of Life Sciences

BT-401 Food Biotechnology

Lecture Schedule	Monday & Thursday 09:30-10:45	**Semester**	Spring 2021
Pre-requisite	F.Sc. /A-level	**Credit Hours**	3+1
Instructor(s)	Dr. Muhammad Zaid	**Contact Moodle link**	muhammad.zaid@umt.edu.pk
Office	**3S-37**	**Office Hours**	Displayed on office door & on Moodle

Objectives

- To acquaint students food and the food industry in addition to principles of enzymology, and food engineering.
- To learn about the relevance of microbes with food industries.
- To learn to genetic engineering tools.
- To learn about microbial food spoilage and its control.
- Social, economic, ecological issues of food biotechnology.
- Genetic modification of bacteria, plants and animals.

Expected Outcomes

This course aims to provide instruction in the general principles of food Biotechnology.

- Think critically; use quantitative reasoning, skeptical inquiry and the scientific approach to solve problems in animal and food sciences.
- Effectively communicate scientific ideas orally and through writing
- Demonstrate knowledge of major scientific concepts, social, economic and ethical implications in the animal and food sciences
- Work collaboratively and independently, learning from diverse perspectives to assimilate knowledge and synthesize new solutions and ways of thinking.

Text book & Reference book(s)

1. 1. Joshi VK, 2012. Food Biotechnology. 1st Edition; I K International Publishing House.
2. Campbell-Platt G, 2009. Food Science and Technology. 1st Edition; Wiley-Blackwell.
3. Singh RP, 2008. Introduction to Food Engineering. 4th Edition; Academic Press
4. Belitz HD, 2009. Food Chemistry. 4th Edition; Springer.
5. Nielsen SS, 2010. Food Analysis. 4th Edition; Springer

Grading Policy	Assignments / Presentations: 20% Quizzes: 15% Midterm: 25% Final: 40%

Course Schedule

Week	Lecture #	TOPICS	CH
1	1 2	• Microbes in Food, history, sources, • Microbiology of quality food	CH 1-4
2	1 2	• Factors influencing microbial growth in different Foods	Chapter 6
3	1 2	• Food enzymes • Colors and additives	Chapter 17
4	1 2	• Overview of metabolic engineering of bacteria for food ingredients	Chapter 12
5	1 2	• Techniques used for production of food ingredients by microbes	Chapter 12
6	1 2	• Genetic modification of plant starches for food applications; • Biotechnological approaches to improve nutritional quality and shelf life of fruits and vegetables	Chapter 12 &13
7	1 2	• Microbial food spoilage and food borne diseases; detection and control of food borne bacteria	Chapter 18
8	1 2	• Pathogens; food safety and quality control; international aspects of quality and safety assessment of food derived by modern biotechnology	Chapter 25
9	1 2	• Mid Term • Production of Pectinases and Utilization in Food Processing	Chapter 14 Book 2
10	1 2	• Biotechnology of Citric Acid Production	Chapter 15
11	1 2	• Microbial Biotechnology of Food Flavor Production	Chapter 16 Book 2
12	1 2	• Microbial Production of Oils and Fats	Chapter 17 Book 2
13	1 2	• Potential Uses of Cyanobacterial Polysaccharides in the Food Industry	Chapter 18 Book 2

14	1 2	• Food Applications of Algae	Chapter 19 Book 2
15		• Final term	

Book 1-Bibek Ray. Fundamental Food Microbiology. 3rd edition 2003. CRC press
Book 2- Kalidas Shetty, Gopinadhan Paliyath, Anthony Pometto, Robert E. Levin. 2nd edition 2006. Taylor & Francis.