



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

**BT-451 Applications of Biotechnology**

<b>Lecture Schedule</b>	Wednesday 9:30-10:45 Saturday 9.30-10:45	<b>Semester</b>	Spring 2021
<b>Pre-requisite</b>	---	<b>Credit Hours</b>	3
<b>Instructor</b>	Mr. Rana Muhammad Mateen	<b>Contact</b>	<a href="mailto:muhammad.mateen@umt.edu.pk">muhammad.mateen@umt.edu.pk</a>
<b>Office</b>	2S-45	<b>Office Hours</b>	See office window
<b>Course Description</b>	To give the concept of various applications of biotechnology in different fields like Health and Pharmaceutical: Applications of biotechnology in health care: Diagnostics, Antibiotics, Biosensors; Therapeutic agents: Hormones, Monoclonal antibodies, Vaccines. Agriculture: Applications of biotechnology in Agriculture, Live-Stock products, Bio fertilizers, Crop improvement; Becontree of Noxious Plants and Animals. Environmental Applications: Process applications; Biotechnology of raw-ore processing (sulfides; carbonates and silicates bioleaching); Accumulation of metals by microbial cells; Bio pulping; Biofuels; Microbial Enhanced Oil Recovery. Food industry: Food Processing; Production of beer, wine, cheese, bread, SCP, citric acid, amino acids.		
<b>Expected Outcomes</b>	The course will enable the students to have brief knowledge about different applications of Biotechnology which are employed in the fields of health, agriculture, animals, environment and industry.		
<b>Textbook(s)</b>	<ol style="list-style-type: none"> <li>1. Fellows, P.J. 2000. Food Processing Technology: Principles and Practice, Second Edition. (Woodhead Publishing in Food Science and Technology).</li> <li>2. Hyone-MyongEun. 1996. Enzymology Primer for Recombinant DNA Technology.</li> <li>3. El-Mansi, E. M. T. 2006. Fermentation Microbiology and Biotechnology.</li> <li>4. Jean-Richard Neeser. 2004. Bioprocesses and Biotechnology for Functional Foods and Nutraceuticals.</li> <li>5. Dilip K. Arora and George G. Khachatourians. 2002. Applied Mycology and Biotechnology: Agriculture and Food Production</li> <li>6. Brian Shmaefsky. 2005. Biotechnology on the Farm and in the Factory: Agricultural and Industrial Applications.</li> <li>7. Bernard R. Glick and Jack J. Pasternak. 2003. Molecular Biotechnology: Principles and Applications of Recombinant DNA.</li> </ol>		
<b>Grading Policy</b>	<ul style="list-style-type: none"> <li>• Quizzes: 15%</li> <li>• Presentation: 05%</li> <li>• Case Study: 10%</li> <li>• Midterm: 25%</li> <li>• Final Exam: 45%</li> </ul>		

## Course Schedule

Lecture #	TOPICS
1	Introduction to Applications of Biotechnology
2	Applications of Biotechnology in human health
3	Applications of Biotechnology in Pharmaceutics
4	Bio-indicators and Biosensors
5	Gene Therapy
6	Genetics and Biotechnology
7	Enzyme Engineering
8	Applications of Environmental Biotechnology
9	<b>Mid Term Exam</b>
10	Genetic manipulation of animals-I
11	Genetic manipulation of animals-II
12	Genetic manipulation of Plants and crops
13	Recent Advancements in Biotechnology
14	CAR-T cell therapy
15	<b>Final Term Exam</b>