



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

Health Biotechnology

Lecture Schedule	Monday & Thursday	Semester	Spring 2021
		Credit Hours	3+1
Instructor (s)	Mr. Rana Muhammad Kamran Shabbir	Contact Moodle link	kamran.shabbir@umt.edu.pk
Office	New Faculty Halls, Main Building North Block Old Smoke Area	Office Hours	See office window
Objectives	To acquaint the student with diagnostic tools, immunization and therapeutics.		
Expected Outcomes	<p>Upon successful completion of the course, the student will be able to:</p> <ul style="list-style-type: none"> • Recognize (even with specific diagnostic tests) the interactions between microorganisms and humans • Identify the innovative elements in projects for the development of new drugs • Recognize the major ethical problems related to clinical trials; • Develop a comprehensive scientific understanding of the causes of human disorders and how medical biotechnology can be applied to the diagnosis of disease and the therapeutic monitoring of patients 		
Course outlines	<p>Introduction to Health biotechnology, Social acceptance of medical biotechnology, The molecular basis of inherited diseases, Molecular and genetic markers, Detection of mutations, Detection of infectious agents, Active and passive immunization, vaccines (live, killed, recombinant DNA vaccines, subunit vaccines, DNA vaccines, edible vaccines), Organ transplantation, transplant rejection, Applications of transgenic animals (animal models of diseases, pharming, farm animals improvement), Drug delivery systems, Blood transfusion, Grafting techniques, Pharmacogenetics, Strategies of gene therapy, gene delivery vehicles, genetic disorders and gene therapy, Biopharmaceuticals from plants, Uses of stem cell technology, assisted reproductive technologies</p>		
Text book & Reference book(s)	<ol style="list-style-type: none"> 1. "Medical Biotechnology" by Judit Pongracz, Mary Keen "(2009). Published by Elsevier Health Sciences. 2. "Biotechnology and Your Health: Pharmaceutical Applications" by Bernice Zeldin Schacter, Bernice Schacter (2005). Published by Chelsea House Publishers, 3. "Health and Pharmaceutical Biotechnology" by D.M. Chetan, K.P. Dinesh, D.M. Chetan (2006). Published by Firewall Media. 		

	<p>4. Glick BR, Delovitch TL, Patten CL. (2010). Medical Biotechnology. ASM Press Washington DC. pp 135-204.</p> <p>5. Khan FA. Biotechnology in Medical Sciences. (2014). CRC. Taylor and Francis Group. pp. 25-37.</p>
Grading Policy	<ul style="list-style-type: none"> • Quizzes 15% • Assignments 10% • Midterm 25% • Final term 30% • Practical 20%

Course Schedule

Lecture #	TOPICS	Readings
Week 1	Introduction to Health biotechnology	Chapter 1 (Alam) Chapter 1 (Bernice)
Week 2	Social acceptance of medical biotechnology The molecular basis of inherited disease	Chapter 12 Ch: 3 Bernard Glick
Week 3	Molecular and genetic markers	Ch: 8 Bernard Glick
Week 4	Detection of mutations Detection of infectious agents	Ch: 10 Bernice Ch: 8 Bernard Glick
Week 5	Active and passive immunization, vaccines (live, killed, recombinant DNA vaccines, subunit vaccines, DNA vaccines, edible vaccines)	Ch: 7 and 11 Bernard Glick
Week 6	Organ transplantation Transplant rejection	Ch: 9 Bernice Ch: 9 Glick
Week 7	Applications of transgenic animals (animal models of diseases, pharming, farm animals improvement)	Ch: 22 Animal Biotech by Masih et al. (Elsevier)

Week 8	Drug delivery systems	Ch: 1 Drug Delivery Concepts by Maiti and Sen (Intech Open)
Week 9	Blood transfusion Assisted Reproductive Technologies	Ch: 8 Bernice
10	Mid Term Exam	
Week 11	Grafting techniques	Ch: 8 (Alam)
Week 12	Pharmacogenetics,	Chapter 12 (Alam)
Week 13	Strategies of gene therapy, gene delivery vehicles, genetic disorders and gene therapy	Ch: 6/7 Bernice
Week 14	Biopharmaceuticals from plants	Ch: 7 Glick
Week 15	Uses of stem cell technology	Ch: 8 Bernice