2023
TP-153

Course Specification
(Bachelor)

Course Title:	**Medical Biotechnology**
Course Code:	**2054203-3**
Program:	**Bachelor in Biotechnology**
Department:	**Biotechnology Department**
College:	**College of Science**
Institution:	**Taif University**
Version:	**V4**
Last Revision Date:	**3/1445 – 9/2023**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 (2 Lecture, 1 Lab)					
2. Course type					
A.	☐ University	☐ College	☒ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (8th level/4thyear)					
4. Course general Description:					
This course is designed to provide detailed knowledge of key concepts of the principles and applications of biotechnology in medicine and healthcare. Topics to be covered include history of medical biotechnology, the role of medical biotechnology in the advancement of medicine, microbial infection and host-pathogen interaction, vaccine development, pharmacogenomics and production of therapeutic proteins and hormones, drug design, drug delivery, genetic testing and genetic screening, and gene therapy using various approaches.					
5. Pre-requirements for this course (if any)**:**					
Molecular Diagnostics, 2053202-3					
6. Co-requirements for this course (if any)**:**					
NA					
7. Course Main Objective(s):					
The course provides detailed knowledge of history, applications, basic characteristics and key concepts of the principle and applications of biotechnology in medicine and healthcare.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	45	100%
2	E-learning		
3	Hybrid ● Traditional classroom ● E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	30
2.	**Laboratory/Studio**	15
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		45

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Recognize the concepts and techniques of medical biotechnology	K3	Lecture	Written Exams
1.2	Describe various applications of medical biotechnology	K3	Lecture	Written Exams
1.3	Explain experimental data and write reports in the principal field of medical biotechnology	K5	Lecture	Written Exams
2.0	Skills			
2.1	Analyze the results of medical biotechnology applications	S1	Problem Solving	Practical Exam, Report
3.0	Values, autonomy, and responsibility			
3.1	Appreciate working in a team and leadership	V3	Project	Report

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Medical Biotechnology	4
2.	Production of therapeutic proteins and hormones	4
3.	Molecular diagnostics of diseases, genetic testing and genetic screening	6
4.	Pharmacogenomics and its applications	4
5.	Microbial infection and host-pathogen interaction	4
6.	Gene therapy and Cell-based therapy	4
7.	Stem cells and its applications in Medical Biotechnology	2
8.	Vaccinations and its rolls in Medical Biotechnology	2
Total		30

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm Exam	Week 7	20%
2.	Periodical exam	Week 10	10%
3.	Report	Week 11	10%
4.	Practical Exam	Week 15	20%
5.	Final Exam	Week 16	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	1. Building Biotechnology, Third Edition, Yali Friedman, 2008. 2. Medical Biotechnology: Achievements, Prospects and Perceptions , Albert Sasson, 2005
Supportive References	Selected articles of general interest will be posted on the blackboard. These reading materials are intended to provide the students with background information on the topics under discussion.
Electronic Materials	Web Sites: http://www.dbtindia.nic.in/program-medical-biotechnology/ Twitter: VIB Medical Biotechnology (@ VIB_CMB)
Other Learning Materials	-

2. Required Facilities and equipment

Items	Resources
facilities	1. One classroom 2 hours per week for each section

Items	Resources
(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	2. Laboratory 3 hours per week for each practical section
Technology equipment (projector, smart board, software)	1. Projector for each classroom 2. Projector in each laboratory
Other equipment (depending on the nature of the specialty)	1. Laboratory for 3 hours per week 2. Inverted Microscopes for cell lines investigation 3. Thermal cycler, Gel documentation system, Western Blot and Tissue Culture Labe.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Peer Review, Students	Direct (Independent Reviewer), Indirect (survey)
Effectiveness of Students assessment	Faculty members	Direct (Random Correction)
Quality of learning resources	Students	Indirect (survey)
The extent to which CLOs have been achieved	Faculty members	Direct
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**DEPARTMENT COUNCIL**
REFERENCE NO.	**6**
DATE	**5/11/2023**