هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	**Biotechnology**
Course Code:	**BIOL 412**
Program:	**Biology**
Department:	**Biology**
College:	**Science**
Institution:	**Jazan University**
Version:	**T-104**
Last Revision Date:	**20 March 2023**

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:					
2. Course type					
a.	University ☐	College ☐	Department☐	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered: Level 10-4th year					
4. Course general Description ➢ Biotechnology course deals with various fundamental techniques for the handling manipulating DNA in the different organisms. ➢ It Study of the applications of biotechnology in the different fields.					
5. Pre-requirements for this course (if any): **Molecular Biology (BIOL 411)**					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s) 1. **1.** To understand the basic structure of DNA and RNA. 2. To study the role of microorganisms in traditional and modern biotechnology. 3. To study tools and techniques used in biotechnology. 4. To understand the application of biotechnology in the field of agriculture and bioremediation. 5. To study the application of biotechnology in health care and forensic medicine. To understand the bioethics related to biotechnology.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	10	80%
2.	E-learning	-	
3.	Hybrid • Traditional classroom • E-learning	1	10%
4.	Distance learning	1	10%

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	11
2.	Laboratory/Studio	22
3.	Field	-
4.	Tutorial	-

5.	Others (self-learning)	2
	Total	35

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	Define all principals, concepts, theories and aspects concerning with biotechnology.	K1.1	Lectures	Quiz, SAQ and written exam
1.2	List all characteristics, importance, features, and steps of biotechnological aspects.	K1.3	Lectures	SAQ and written exam
1.3	Differentiate (Compare) between different mechanisms, functions, practices and aspects related to biotechnology.	K2.1	Lectures, Lab work, self-directed study	SAQ, assignment, written exam and lab work assessment.
2.0	Skills			
2.1	Debate/Explain all processes, mechanisms, definitions, theories, mode of actions of all biotechnology aspects.	S1.1	Lectures, Lab work, self-directed study	Written exam, lab work assessment, assignment.
2.2	Apply the theoretical knowledge and understanding in laboratory experiments and techniques in biotechnology.	S1.2	Lectures, Lab work, Group Discussion, self-directed study	SAQ, assignment, written exam and lab work assessment.
2.3	Write a report about any practical or theoretical tasks related to biotechnology.	S3.3	Group Discussion	Assignment
3.0	Values, autonomy, and responsibility			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Develop competencies in critical thinking, delivering scientific information, reporting and data analysis.	V3.2	Group Discussion, Lab work	Lab work assessment and assignment
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction: Structure of DNA and RNA	Self-directed study
2.	Use of Microbes in biotechnology	1
3	Human Genome Project, Proteomics and Bioinformatics.	1
4	Methods and tools biotechnology: PCR and recombinant DNA.	1
5	Methods and tools biotechnology: Gel electrophoresis, plasmids, and probes	1
6	Traditional biotechnology and fermentation.	1
7	Applications of biotechnology: Farm Products and Food technology.	1
8	Applications of biotechnology: Pharmaceutical Products	1
9	Applications of biotechnology: Gene Therapy.	1
10	Applications of biotechnology: Forensics	1
11	Applications of biotechnology: Bioremediation	1
12	Bioethics related to biotechnology.	1
Total		11

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Theory assignment	8	5
2.	Theoretical quiz	3	5
3.	Mid-term exam	5	10
4.	Practical quiz	6	5
5.	Practical assignment	7	5
6.	Final practical exam	11	20

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
7.	Final Exam	12	50
...			

*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.رولف د.شميد.2003.دليل التقانة الحيوية و الهندسة الوراثية. سلسلة كتب التقنيات الاستراتيجية و المتقدمة. مدينة الملك عبد العزيز للعلوم و التقنية. 2. عبد المنعم محمد الاعسر.2014.مقدمة في التقنية الحيوية. المكتبة الاكاديمية. القاهرة.
Supportive References	**- Glazer A.N., Nikaido H. (2010) Microbial Biotechnology - Fundamentals of Applied Microbiology, Cambridge University Press, Cambridge.** **- F. Sambrook, R.W. Russell (2008) Molecular Cloning. Laboratory Manual. Cold Spring Harbour Laboratory Press.**
Electronic Materials	YouTube video links, pictures and photos related to the course will be uploaded in Blackboard few times during the semester to strengthen student knowledge and understanding.
Other Learning Materials	-

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	1 Lecture room(s) for groups of 50 students. 1 Laboratory for group of 25 students.
Technology equipment (projector, smart board, software)	AV, data show, Smart Board
Other equipment (depending on the nature of the specialty)	Light microscopes, glassware, chemicals, consumables.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, Faculty	Direct (Questionnaire)
Effectiveness of students assessment	Peer Reviewer	Direct (Cross Check marking)
Quality of learning resources	QA. Committee	Indirect (Benchmarking)
The extent to which CLOs have been achieved	Program Leader	Indirect (QA Committee)
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	Biology Department Board
REFERENCE NO.	BIO2214
DATE	20/9/2022AD