



Course Specifications

Course Title:	Introduction to Biotechnology
Course Code:	2051204 -3
Program:	Bachelor in Microbiology
Department:	Department of Biotechnology
College:	College of Sciences
Institution:	Taif University

Table of Contents

A. Course Identification	3
6. Mode of Instruction (mark all that apply)	3
B. Course Objectives and Learning Outcomes	3
1. Course Description	3
2. Course Main Objective.....	3
3. Course Learning Outcomes	4
C. Course Content	4
D. Teaching and Assessment	4
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods	4
2. Assessment Tasks for Students	5
E. Student Academic Counseling and Support	5
F. Learning Resources and Facilities	5
1. Learning Resources	5
2. Facilities Required.....	6
G. Course Quality Evaluation	6
H. Specification Approval Data	6

A. Course Identification

1. Credit hours: 3 (2 Lecture, 1 Lab)
2. Course type
a. University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
3. Level/year at which this course is offered: 1 st Level/ 1 st Year
4. Pre-requisites for this course (if any): None
5. Co-requisites for this course (if any): None

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	6 hr\Week	100%
2	Blended	-	-
3	E-learning	-	-
4	Distance learning	-	-
5	Other	-	-

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	-
4	Others (specify)	-
	Total	60

B. Course Objectives and Learning Outcomes

1. Course Description

This course is concerned with the general principles and applications of biotechnology. It covers the basic structure and function of genetic material, expression of genetic information, DNA technology and its applications, vectors, recombinant DNA technology, techniques for production of transgenic plants and animals, and applications of biotechnology in agriculture, environment, and medicine.

2. Course Main Objective

The main objective of this course was to describe the history of biotechnology, to outline the molecular basis of biotechnology, to know essential terminology in biotechnology and to recognize the various applications of biotechnology.

3. Course Learning Outcomes

CLOs		Aligned PLOs
1	Knowledge and Understanding	
1.1	Recognize the history of biotechnology, the gene structure and the gene expression processes	K1
1.2	Identify the socioeconomic relevance of biotechnological applications	K2
1.3	Describe the agricultural, medical, pharmaceutical and environmental applications of biotechnology	K3
2	Skills :	
2.1	Evaluate the different methods applications of biotechnology	S2
3	Values:	
3.1		

C. Course Content

No	List of Topics	Contact Hours
1	Introduction and historical aspects	3
2	Structure & replication of nucleic acids	3
3	Gene expression	3
4	DNA Technology	3
5	Vectors, Plasmids, Bacteriophage, cosmids, Artificial Chromosomes	3
6	Introduction of genes to plant cells	3
7	Agricultural applications of biotechnology	3
8	Introduction of genes to animal cells	3
9	Medical and pharmaceutical applications of biotechnology	3
10	Environmental and industrial applications of biotechnology	3
Total		30

No	List of Practical Topics	Contact Hours
1	Tools, methods and safety in biotechnology labs	3
2	DNA packaging and organization: nucleosome, solenoid, chromatin and chromosome	3
3	Cell cycle	3
4	DNA basic structure& DNA model construction	3
5	Isolation of DNA from plant samples	3
6	Polymerase Chain Reaction	3
7	DNA Cloning using Plasmid Vector	3
8	Isolation of Plasmid DNA	3
9	Endonucleases and restriction mapping	3
10	Methods and protocols used in detection of Genetically Modified products	3
Total		30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
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Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge and Understanding		
1.1	Recognize the history of biotechnology, the gene structure and the gene expression processes	Lecture	Written Exam
1.2	Identify the socioeconomic relevance of biotechnological applications	Lecture	Oral Exam
1.3	Describe the agricultural, medical, pharmaceutical and environmental applications of biotechnology	Lecture	Written Exam
2.0	Skills		
2.1	Evaluate the different methods applications of biotechnology	Report	Report evaluation
3.0	Values		
3.1			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm exam	Week 5	20%
2	Periodical exam	Week 8	10%
3	Project	Week 9	10%
4	Practical Exam	Week 10	20%
	Final Exam	Week 11	40%

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

Six hours per week of office hours are available for each faculty members for consultations and academic advice.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	An Introduction to Biotechnology: The Science, Technology and Medical Applications. 1st Ed., W T Godbey, Academic Press 2014
Essential References Materials	Introduction to biotechnology. 2nd Ed., Thieman, William J., Pearson/Benjamin Cummings, 2009.
Electronic Materials	NBCI website: https://www.ncbi.nlm.nih.gov
Other Learning Materials	<ul style="list-style-type: none"> - Online videos of biotechnology, DNA models - http://biologybiotechnology.unicam.it/ - https://www.bio.org/

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	One classroom with internet connection for 2 hours a week and one laboratory for 3 hours a week with internet facility.
Technology Resources (AV, data show, Smart Board, software, etc.)	Data show, internet connection.
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	1. Microscopes, Thermocycler, Gel electrophoresis and Gel Documentation units. 2. Glass slides. 3. Microscopic stains

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course management and planning	Students	Indirect
Effectiveness of teaching and assessment	Students	Indirect
Quality of learning resources	Students	Indirect
Effectiveness of Evaluation and exams	Students, Peer Reviewer	Indirect, Direct

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

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

Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Department Council
Reference No.	7
Date	16-6-1443

كلية العلوم
قسم الأحياء
College of Science
Department of Biology



عمادة كلية العلوم
Deanship of Science College
جامعة الطائف
TAIF UNIVERSITY