



## Course Specifications

<b>Course Title:</b>	<b>Microbial Genetics</b>
<b>Course Code:</b>	<b>2013213-3</b>
<b>Program:</b>	<b>Bachelor in Microbiology</b>
<b>Department:</b>	<b>Biology Department</b>
<b>College:</b>	<b>College of Sciences</b>
<b>Institution:</b>	<b>Taif University</b>

## Table of Contents

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

## A. Course Identification

<b>1. Credit hours:</b> 3h
<b>2. Course type</b> a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/> b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 8 <sup>th</sup> level – 3 <sup>rd</sup> year
<b>4. Pre-requisites for this course (if any):</b> Genetics - 2012201-2
<b>5. Co-requisites for this course (if any):</b> None

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	6 hrs/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)	-
	<b>Total</b>	<b>60</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description:

This course provides students with exposure to selected topics in the field of microbial genetics, focusing on the processes of heredity in bacteria including a discussion of gene structure and evolution, gene expression and its control, the exchange of genetic material in the microbial world and genetic engineering and its applications. The laboratory component will emphasize modern approaches to genetic engineering.

### 2. Course Main Objective:

Basic and advanced material related to microbial genetics and applied molecular microbiology will be introduced to students through various student-lead exercises, including small-group tutorials, oral presentations of assigned and selected research papers, ongoing laboratory exercises and a class-end poster session where students will research and present, in a conference-style poster format, topics relevant to microbial genetics. It is hoped that this will provide a more involved, hands-on experience for the students, who will, thus, take a more active role in the course and in the learning experience.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
<b>1</b>	<b>Knowledge and Understanding:</b>	
1.1	Outline the genetic materials in microorganisms.	K2
1.2	Recognize gene regulation and gene expression in microorganisms	K3
<b>2</b>	<b>Skills:</b>	
2.1	Investigate the methods of transmission of genetic information in different microorganisms	S2
2.2	Demonstrate the transcription in bacteria and fungi.	S4
<b>3</b>	<b>Values:</b>	
3.1	Prepare and illustrate proper presentations related to the studied topics	V2

### C. Course Content

No	List of Topics	Contact Hours
1	Types of a genetic variation in various organisms	3L + 3P
2	Regulation and composition of genetic and microbial genetic materials in viruses, bacteria and fungi.	3L + 3P
3	Genetic mapping of genes	3L + 3P
4	Methods of transmission of genetic information.	3L + 3P
5	Mutagenesis, induction, isolation and characterization of microbial mutants.	3L + 3P
6	Genetic basis of Recombination in bacteria	3L + 3P
7	Molecular basis of DNA repair in bacteria	3L + 3P
8	Gene expression. Transcription of genes in microorganisms	3L + 3P
9	Regulation of gene expression in bacteria and translation	3L + 3P
10	Gene transfer- Transformation, Transduction and Conjugation.	3L + 3P
<b>Total</b>		<b>30L + 30P</b>

### D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and Understanding:</b>		
1.1	Outline the genetic materials in microorganisms.	Lectures Concept maps	Written exams
1.2	Recognize gene regulation and gene expression in microorganisms	Lectures	Written exams
<b>2.0</b>	<b>Skills:</b>		
2.1	Investigate the methods of transmission of genetic information in different microorganisms	Interactive learning Brain storming	Practical reports Practical exam
2.2	Demonstrate the transcription in bacteria and fungi.	Lectures	Written exams
<b>3.0</b>	<b>Values:</b>		

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.1	Prepare and illustrate proper presentations related to the studied topics	Small group activities Interactive learning	Assignments Reports

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments and activities: 1- Written Assignment Power-point presentation	Variable	10
2	Midterm Exam	5 <sup>th</sup>	20
3	Periodic Exam	7 <sup>th</sup>	10
4	Practical Reports	Continuous	15
5	Final Practical Exam	11 <sup>th</sup>	5
6	Final Exam	12 <sup>th</sup>	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 :**  
6 hours per week for academic advice and consultations  
Teaching staff is also available using Blackboard web site and Taif University “Edugate” System

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	Stanley Maloy. Microbial Genetics (Jones and Bartlett Series in Biology) 2nd Edition. Jones and Bartlett Publishers, Inc.; 2nd edition (April 25, 2004). ISBN-10 : 0867202483
<b>Essential References Materials</b>	Uldis N. Streips, Ronald E. Yasbin. (2002) Modern Microbial Genetics, Second Edition Editor(s): Published Online: 28 JUN. Print ISBN: 9780471386650. Online ISBN: 9780471221975.DOI: 10.1002/047122197X.
<b>Electronic Materials</b>	Blackboard website -Website of Saudi digital Library
<b>Other Learning Materials</b>	Computer-based programs and professional software

### 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> <li>Classroom (capacity not more than 40 students) for 2 h/week.</li> <li>Microbiology Lab (capacity not more than 20 students) for 3 h/week.</li> </ul>

Item	Resources
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	<ul style="list-style-type: none"> <li>▪ Data Show projectors, smart blackboard</li> <li>Computer Portable PowerPoint presentations to special lectures.</li> </ul>
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	<ul style="list-style-type: none"> <li>▪ PCR machine</li> <li>▪ Master mix</li> <li>▪ DNA Primers</li> <li>▪ DNA extraction kit.</li> <li>▪ Autoclave</li> <li>▪ Incubators</li> <li>▪ Micropipettes and its tips</li> <li>▪ Petri dishes</li> <li>▪ Disinfectants</li> <li>▪ Culture media</li> </ul>

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Indirect
Quality of learning resources	Peer Reviewer Students	Direct Indirect
Extent of achieving the course learning outcomes	Peer Reviewer Students	Direct Indirect

**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	Biology Department
Reference No.	Committee number 14 - Academic Year 1442-1443H
Date	22\5\2022G – 21\10\1443H

كلية العلوم  
قسم الاحياء  
College of Science  
Department of Biology



عمادة كلية العلوم  
Deanship of Science College  
جامعة الطائف  
TAIF UNIVERSITY