



Course specifications (Postgraduate Degree)

Course Title:	Microbiological Biotechnology
Course Code:	566 MIC
Program:	MSC. in Microbiology
Department:	Department of Botany and Microbiology
College:	College of Science
Institution:	King Saud University

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A. Course Identification

1. Credit hours: 2 (1+1)
2. Course type <input checked="" type="checkbox"/> *Required <input type="checkbox"/> Elective
3. Level/year at which this course is offered: Second level
4. Pre-requisites for this course (if any): NA
5. Co-requisites for this course (if any): NA

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	28	100 %
2	Blended		
3	E-learning		
4	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	20
2	Laboratory/Studio	
3	Seminars	8
4	Others (specify)	
	Total	28
Other Learning Hours*		
1	Study	15
2	Assignments	8
3	Library	15
4	Projects/Research Essays/Theses	7
5	Others(specify)	
	Total	45

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

Study of the general principles and applications of microbial biotechnology and the most important applied fields in the microbial industries.

2. Course Main Objective

The aim is to provide graduates with the theoretical, practical, research and professional skills necessary to enable them to undertake further post-graduate training or employment in academic research and industrial research.

3. Course Learning Outcomes

Course Learning Outcomes (CLOs)		Aligned PLOs*
1	Knowledge	
1.1	Students will be able to learn about the general characteristics of microorganisms used in biotechnology.	K1.1
1.2	Students will be able to determine the basic criteria for the efficiency of industrial microbial strains..	K1.2
1.3		
2	Skills	
2.1	Students will be able to bio-recycle waste in the environment in the laboratory.	S 2.1 S 2.2
2.2	Students will be able to improve the mechanism and working conditions of fermentation in the laboratory and factory.	S2.3
2.3	Students will be able to apply genetic engineering ethics in the lab.	S 2.4
2...		
3	Competence	
3.1	Students will be able to predict the results of metabolic pathways of microbial strains in fermented.	C3.1
3.2	Apply the studied techniques professionally	C3.5
3.3	Students will be able to work in a group to plan the fermentation of a microbial strain in factories.	C3.3 C3.4
3...		

* Program Learning Outcomes

C. Course Content

No	List of Topics	Contact Hours
1	Basics of Construction Microbial Biotechnology.	2
2	Morphological and physiological characteristics of microbial	4
3	Scope of Biotechnology and Industrial Microbiology	4
4	Some Microorganisms Commonly Used in Industrial Microbiology and Biotechnology	2
5	Industrial Media and the Nutrition of Industrial Organisms	4
6	Metabolic Pathways for the Biosynthesis of Industrial Microbiology Products	2
7	Basic operations in industrial fermentations and Extraction of Fermentation Products	4
8	control and use of microorganisms in the food industry, water quality and bioremediation	2
9	Production of commodities of medical importance – Vaccines- Drug	2
10	Ethics of genetic engineering	2
Total		28

D. Teaching and Assessment

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

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	Knowledge		
1.1	Students will be able to learn about the general characteristics of microorganisms used in biotechnology.	The Lecture	Lab exams
1.2	Students will be able to determine the basic criteria for the efficiency of industrial microbial strains.	Practical Lessons	Presentations by students
1.3	Students will be able to learn about the general characteristics of microorganisms used in biotechnology.	<ul style="list-style-type: none"> • Internet communications. • Presentations by students Seminars with students and specialists	Discussions during the lectures
2.0	Skills		
2.1	Students will be able to bio-recycle waste in the environment in the laboratory.	Practical Experiments <ul style="list-style-type: none"> • Seminar 	Lab exams Presentations
2.2	Students will be able to improve the mechanism and working conditions of fermentation in the laboratory and factory.		
2.3	Students will be able to apply genetic engineering ethics in the lab.		
3.0	Competence		
3.1	Students will be able to predict the results of metabolic pathways of microbial strains in fermented.	Reports, homework assignments, laboratory exercises, discussion and presentations	Writing group reports, group class presentations, laboratory exercises,
3.2	Apply the studied techniques professionally		
3.3	Students will be able to work in a group to plan the fermentation of a microbial strain in factories.		

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Midterm exam	6	30%
2	Worksheet	4	10%
3	Discussion	9	10%
4	Presentation	11	10%

#	Assessment task*	Week Due	Percentage of Total Assessment Score
5	Final Exam	15	40%
6			
7			
8			

*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:

- Office hours (Two hour per week)
- Personal web site
- Contact by e-mail

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Book: Biology of Microorganisms
Essential Reference Materials	Journals, Reports, etc
Electronic Materials	YouTube, e-Books
Other Learning Materials	Electronic Materials, Web Sites etc

2. Educational and research Facilities and Equipment Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	<ul style="list-style-type: none"> • Lecture class equipped with a Data Show • E-learning class for reviewing the course, internet communications and other numerical skills
Technology Resources (AV, data show, Smart Board, software, etc.)	Computers with the office and statistical software
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Questionnaires filled by the students at the beginning and the end of the semester	Notes and advises from colleagues and other staff	Direct

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Seminars with the students to discuss the learning strategies and its improvement	Independent evaluation by the students	Direct
Internet communications with the students	Studying the reports of self assessment and the independent reviewers reports	Direct
Comparisons and statistical analysis of the students degrees within and among groups	Investigation of a sample of the answer sheets by an Independent faculty staff	Direct
Workshops and seminars with the students, colleagues and specialists	Periodic interchange investigation of the some answer sheets with some colleagues	Direct

Evaluation Areas/Issues (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	BOTANY AND MICROBIOLOGY / by Dr. Amal ALmousa & Dr. Najat Marraik
Reference No.	
Date	13/10/2019