



Course specifications (Postgraduate Degree)

Course Title:	Spores Biology
Course Code:	661MBIO
Program:	Ph.D in Microbiology
Department:	Botany and Microbiology
College:	Science
Institution:	King Saud University

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A. Course Identification

1. Credit hours: 2 (2+0)
2. Course type <input type="checkbox"/> Required <input checked="" 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

Studying the history of spores, defining and classifying them according to structure, movement and function, in addition to identifying the mechanics of their formation, germination, life cycle and their role in pollution and infection.

2. Course Main Objective

The aim of this course is to identify the mechanisms of spore formation, germination methods, life cycle and role in pollution and infection.

3. Course Learning Outcomes

Course Learning Outcomes (CLOs)		Aligned PLOs*
1	Knowledge	
1.1	Students will be able to recall the general mechanisms of spore formation, germination methods, life cycle.	K1.1
1.2	Students will be able to describe the principles and applications of the advanced approaches used for pollution and infection.	K1.4
1.3	Students will be able to underline the control of spores infection that require further investigation in the field of specialization.	K1.2
1...		
2	Skills	
2.1	Students will be able to proficiently apply the standard operating protocols of conventional and advanced laboratory procedures and reconstruct new strategies for prevention and treatment of Spores Biology infections.	S2.1
2.2	Students will be able to design study plans to solve problems pollution from Spores Biology.	S2.2
2.3		
3	Competence	
3.1	Students will be able to interpret results of spores contamination and correlate data in a scientific context.	C3.2
3.2	Students will be able to present the scientific data and research results in meetings, seminars, and conferences.	C3.7
3...		

* Program Learning Outcomes

C. Course Content

No	List of Topics	Contact Hours
1	History and Etymology for spore,	2
2	Definition, forms, places of deployment	2
3	Mechanisms of the formation and germination of spores	2
4	Classification of spore-producing organisms (Plants, Microbes)	4
5	Classification of spores (By spore-producing structure, By motility, By function, By origin during life cycle)	6
6	Homosporous and Heterosporous; monoete and trilete	2
7	Resistance to environmental factors	2
8	Their role in the microbial dispersal,	4
9	pollution and infection	4
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 recall the general mechanisms of spore formation, germination methods, life cycle.	lecture	projects report
1.2	Students will be able to describe the principles and applications of the advanced approaches used for pollution and infection.	lecture	Home work
1.3	Students will be able to underline the control of spores infection that require further investigation in the field of specialization.	reports, presentations	Quizzes, , discussions
2.0	Skills		
2.1	Students will be able to proficiently apply the standard operating protocols of conventional and advanced laboratory procedures and reconstruct new strategies for prevention and treatment of Spores Biology infections.	lab experiments and reports,	Oral presentation Assigning some group project
2.2	Students will be able to design study plans to solve problems pollution from Spores Biology.		
...			
3.0	Competence		
3.1	Students will be able to interpret results of spores contamination and correlate data in a scientific context.	lectures • workshops	Presentation, Essay Discussion
3.2	Students will be able to present the scientific data and research results in meetings, seminars, and conferences.		
...			

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%
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 (2/ weekly)

Personal web site

Contact through e-mail

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	<p>1-Roff, D. <i>The Evolution of Life Histories: Theory and Analysis</i>. New York: Chapman & Hall, 1992</p> <p>2- Graham, L., J. Graham, and L. Wilcox. <i>Plant Biology</i>, Upper Saddle River, NJ: Pearson Education, 2003</p> <p>3- Esther R Angert. (2014). Sporulation in Bacteria: Beyond the Standard Model. ResearchGate</p>
Essential Reference Materials	
Electronic Materials	
Other Learning Materials	<p>https://www.microscopemaster.com/sporulation.html</p> <p>https://www.microscopemaster.com/sporulation.html#gallery[pageGallery]/0/</p> <p>https://micro.cornell.edu/research/epulopiscium/bacterial-endospores</p> <p>https://www.onlinebiologynotes.com/bacterial-spore-structure-types-sporulation-germination/</p> <p>https://www.newworldencyclopedia.org/entry/Spore</p>

2. Educational and research Facilities and Equipment Required

Item	Resources
<p>Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)</p>	Classrooms, laboratories, demonstration rooms/labs
<p>Technology Resources (AV, data show, Smart Board, software, etc.)</p>	data show, Smart Board, software
<p>Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)</p>	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Student, peer Reviewer, program leaders	Course evaluation questioner Students- faculty meetings

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Extent of achievement of course learning outcomes	Program Leaders, faculty, quality and development unit	Preparation of course report Peer consultation on teaching Departmental council discussions Self evaluation
Quality of learning resources	Student, faculty, internal and external auditors	Course evaluation Self-study report

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
Reference No.	
Date	