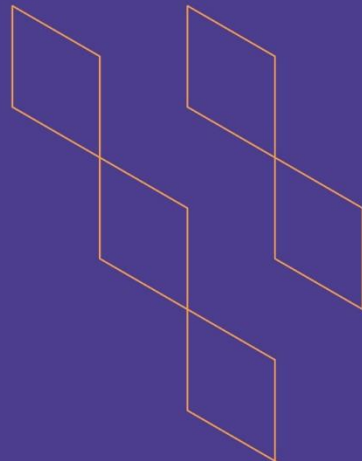




T-104
2022

Course Specification



Course Title: Aquaculture Microbiology and Operational Biosecurity
Course Code: APAC1602
Program: Aquaculture Technology
Department:
College: Applied College
Institution: Umm Al-Qura University
Version: 2
Last Revision Date: December 2024



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A. General information about the course:

Course Identification

1. Credit hours: 4 hours

2. Course type

a. University ☐ College ☐ Department ☒ Track ☐ Others ☐

b. Required ☒ Elective ☐

3. Level/year at which this course is offered:

1st Semester

4. Course general Description

This course will provide an introduction to microbiology, including brief historical background, general characteristics of procaryotic cells and differentiation between procaryotes and eucaryotes. An overview about the beneficial and hazardous roles of microorganisms in human life and the environment with more focus on aquacultures. This course also provides insights into Biosecurity and its benefits in the aquaculture business. It deals with fish and shrimp diseases and the factors for their expressions. It presents the common diagnostic tolls, prevention, and control. It describes the biosecurity devices in Aquaculture.

5. Pre-requirements for this course (if any):

None

6. Co- requirements for this course (if any):

None

7. Course Main Objective(s)

- ❖ List the different types of microorganisms.
- ❖ Describe the most important microorganisms that are the main concern in aquaculture.
- ❖ Outline the techniques employed in propagation and detection of microorganisms.
- ❖ Interpret results based on detection techniques.
- ❖ Understand more about diseases and the factors for their expression.
- ❖ Appreciate the need for and importance of Biosecurity in the aquaculture business.
- ❖ Define the critical factors in the aquaculture operation and determine the control points.
- ❖ Gain insight on the best practices being done by successful aquaculture

producing countries.

- ❖ Determine the best practices applicable to the current situation.

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom		90%
2.	E-learning		10%

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	45 h
2.	Laboratory/Studio.	42 h
3.	Field	
4.	Tutorial	
	Total	87 h

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	List the different types of microorganisms	K5	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
1.2	Describe the most important microorganisms that are the main concern in aquaculture	K3	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
1.3	Outline the techniques employed in	K1	-Lectures	-Oral



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	propagation and detection of microorganisms		-Discussions -Presentations	presentations -Quizzes -Assignments -Final exam
1.4	Interpret results based on detection techniques	K2	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
1.5	Define Biosecurity and overview	K3	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
1.6	Describe fish and shrimp disease and their diagnosis, prevention and control	K5	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
1.7	Describe biosecurity Devices in Aquaculture	K3	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
2.0	Skills			
2.1	Develop oral presentation	S1	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
2.2	Communicating personal ideas and thoughts	S2	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.3	Demonstrate assertiveness of decision	S3	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
3.0	Values, autonomy, and responsibility			
3.1	Work independently and as part of a team	V2	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam
3.2	Demonstrate responsibilities and accountability	V3	-Lectures -Discussions -Presentations	-Oral presentations -Quizzes -Assignments -Final exam

C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to microbiology Definition and overview, what are microorganisms, types of microorganisms	3
2.	Beneficial and Hazardous microorganisms	3
3.	Basic microbiology tools	3
4.	Vibrio species: Morphology and physiology, vibriosis, epidemiology of Vibrio spp., clinical features, pathology, transmission, diagnosis, control of vibrios	6
5.	Microbiology techniques Spread plate method, pour plate method, swab test, preparation	6



	and plating of samples, detection methods	
6.	Biosecurity Principles and Overview (HACCP principles)	6
7.	Factors in Disease Expression • Shrimp • Pathogen • Environment • finfish	3
8.	Benefits of Biosecurity	3
9.	Common Finfish and Shrimp Diseases	3
10.	Disease Diagnosis, Prevention and Control • Common Diagnostic Tools • Disease Prevention and Treatment	6
11.	Biosecurity Devices in Aquaculture • Physical Barriers • Biological Measures • Chemical Precautionary Measures	3
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Periodical Exam(s)	3	10%
2.	Mid Term Exam (Theoretic)	6	20%
3.	Mid Term Exam (practical)	7	10%
4.	Reports and essay	5	10%
5.	Final Practical Exam	15	10%
6.	Final Exam	16	40%

*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	<ul style="list-style-type: none"> – Madigan M, Aiyer J, Buckley D et al. (2021) Brock Biology of Microorganisms 16th edition. Pearson Education. ISBN: 978-1292404790 – Willey J, Sandman K, Wood D. (2022) Prescott's Microbiology. McGraw Hill. ISBN: 978-1256123031 – Brown A. (2014) Benson's Microbiological Applications Complete Version 13th edition. McGraw Hill. ISBN: 978-0077668020 – Palić, Dušan and Scarfe, A. David. Biosecurity in aquaculture: practical veterinary approaches for aquatic animal disease prevention, control, and potential eradication. 2018. ISBN9781789245684. – A. David Scarfe, Cheng-Sheng Lee, and Patricia J. O'Bryen. Aquaculture Biosecurity: Prevention, Control, and Eradication of Aquatic Animal Disease, 2006. ISBN 9780470791820.
Supportive References	Leung, Ka Yin. Current Trends in the Study of Bacterial and Viral Fish and Shrimp Diseases, 2004. ISBN 978-9812387493
Electronic Materials	Slides and handouts of selected readings
Other Learning Materials	Multi- media associated with the textbook and the relevant websites

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms are already provided with data show
Technology equipment (projector, smart board, software)	Projectors





Items	Resources
Other equipment	

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect: regular surveys to evaluate teaching effectiveness and course relevance Direct: CLO's assessment
Effectiveness of student's assessment	Peer review	Direct: Annual review of course content by faculty members and external experts
Quality of learning resources	Students	Indirect: regular surveys to evaluate quality of learning resources
The extent to which CLOs have been achieved	Peer review	Direct: Annual review of course content by faculty members and external experts
Other		

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

Assessment Methods (Direct, Indirect)





G. Specification Approval Data

COUNCIL /COMMITTEE	Umm Al-Qura University Council
REFERENCE NO.	851141114462/190390
DATE	446/11/22

