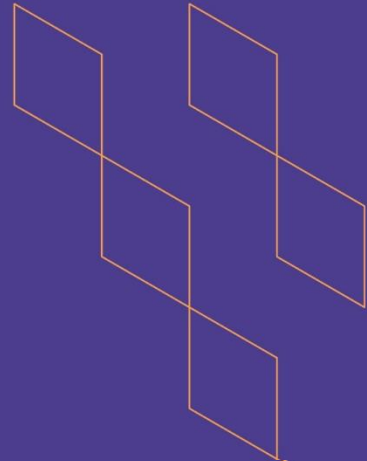




T-104  
2022

## Course Specification



Course Title: Basic math for aquaculturists
Course Code: APAC1604
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: 2 hours

### 2. Course type

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

b. Required ☒ Elective ☐

3. Level/year at which this course is offered: 1<sup>st</sup> Semester

### 4. Course general Description

This course introduces the most commonly mathematical tools in aquaculture. The first set of calculations works on the volumes of different size and shaped tanks. The second component has students calculate concentrations (how much salt is needed to attain a certain salinity), and stocking densities (how many eggs can be stocked in a certain volume of water). Not only students practice their metric conversions, but they also understand how and why it is important for biologists to be familiar with these geometric formulas that are used every day.

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

None

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

None

### 7. Course Main Objective(s)

By the end of this course the students will be able to:

- Familiarize themselves on the important mathematical operations and functions used in aquaculture.
- Understand the terminologies and applications to the various functions and formulas and use them to solve common problems and information requirements.
- Identify the right tools to use when faced with mathematical problems.
- Understand Biostatistical methods and application in aquaculture.

### 1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom		90%
2.	E-learning		10%
3.	Hybrid <ul style="list-style-type: none"> <li>Traditional classroom</li> <li>E-learning</li> </ul>		
4.	Distance learning		

### 2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	30
2.	Laboratory/Studio	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	<b>Total</b>	<b>30</b>

## 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	Understand some of the most common conversions.	K4	Lecture Tutorials	Exams Quizzes Written and possibly oral exam at the end of the course. In addition, compulsory work may be given during the course
1.2	Calculate the volume of different sized and shaped using the metric system.	K4		
1.3	Define coefficient of variation and characterize it.	K1		



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.4	Understand Biostatistical methods and application in aquaculture.	K4		
2.0	Skills			
2.1	Develop capability to sample and data analysis using statistical tools.	S1	Lecture Tutorials	Exams Quizzes Homework Written and possibly oral exam at the end of the course. In addition, compulsory work may be given during the course
2.2	Enable to develop and test hypotheses.	S2		
2.3	Establish specific concentrations and dilutions of substances in water.	S3		
2.4	Derive stocking strategies using different methods (volume and weight).	S4		
3.0	Values, autonomy, and responsibility			
3.1	Use tools from mathematics to make good professional decisions.	V1	Lecture  Individual or group work	Homework
3.2	Motivate personal values to serve the teamwork positively.	V2		
3.3	Develop improved collaborative skills.	V3		

### C. Course Content

No	List of Topics	Contact Hours
1.	Commonly used units and conversions -Nets and Filters	4





	-Area and Volume -Temperature -Mass -Power	
2.	Commonly used formula -Average Daily Gain (ADG) -Feed Conversion Ratio (FCR) -Mean Body Weight (MBW) -Electricity -Specific Growth Rate (SGR), Survival Rate (SFR), and mortality rate calculations	4
3.	Concentration and Dilution -Percentage (%) -Parts per thousand (ppt) -Parts per Millions (ppm) -Parts per Billions (ppb) -Dilution formula -Practical Application	4
4.	Crop estimation -Biomass and population estimation -Survival rate estimation	4
5.	Feed and Feeding management. -Feed Adjustment Computations -Feed Forecasting	2
6.	Coefficient of variation -Definition -Uses / Applications	4
7.	Biostatistics	8
Total		30

## D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm	7th week	30%
2.	Homework + Reports + Quizzes		20%
3.	Final exam	16	50 %

\*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"> <li>– Aitken, Mike, Braadhurst, Bill, Hladky, Steve. 2009. Mathematics for Biological Scientists. Garland Science Publishing, New York</li> <li>– Ram C. Bhujel. 2009. Statistics for Aquaculture. Wiley ISBN: 978-0-813-81587-9</li> </ul>
Supportive References	<ul style="list-style-type: none"> <li>– Sustainable Aquaculture, Hernandez, Vegara. Intech 2014</li> </ul>
Electronic Materials	<ul style="list-style-type: none"> <li>– <a href="http://www.onlineconversion.com/">http://www.onlineconversion.com/</a></li> <li>– <a href="https://www.metric-conversions.org/">https://www.metric-conversions.org/</a></li> </ul>
Other Learning Materials	<ul style="list-style-type: none"> <li>– None</li> </ul>

### 2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms
Technology equipment (projector, smart board, software)	Projector, Smart board
Other equipment (depending on the nature of the specialty)	

## 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



Assessment Areas/Issues	Assessor	Assessment Methods
		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

**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

