Quantitative and Population Genetics Zoo 552

Course specifications

(Postgraduate Degree)

Course Title:	Quantitative and Population Genetics
Course Code:	Zoo 552
Program:	Master's Degree Courses
Department:	Zoology Department
College:	College of Science
Institution:	King Saud University

Table of Contents

A. Course Identification

1. **Credit hours:2**	
2. Course type	
□ Required	□ Elective
3. **Level/year at which this course is offered:**	
4. **Pre-requisites for this course** (if any)**:** Zoo374	
5. **Co-requisites for this course** (if any)**:**	

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**		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**	15
2	**Laboratory/Studio**	
3	**Seminars**	
4	**Others** (specify)	30
	Total	45
Other Learning Hours*		
1	**Study**	
2	**Assignments**	
3	**Library**	
4	**Projects/Research Essays/Theses**	
5	**Others** (specify)	
	Total	

* 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
Detailed studies on the correlation between the histology and the function of the digestive, urinary and reproductive systems. Also, studying structural and functional changes during programmed cell death in different organs.

2. Course Main Objective

The goal of this course is to introduce basic principles in population and quantitative genetics. Population genetics describes relationships between allele and genotype frequencies illustrates frequency shifts due to evolutionary forces such as migration, mutation, drift, and selection. Quantitative genetics describes the connection between genotype and phenotype and provides tools to illustrate how phenotypic selection changes allele frequencies. Molecular breeding is based in both of these disciplines, so materials introduced in this module are the foundation for all subsequent modules.

3. Course Learning Outcomes

	Course Learning Outcomes (CLOs)	Aligned PLOs*
1	**Knowledge**	
1.1	Comprehend the basic of quantitative and population genetics.	
1.2	Describe the genetic population structure	
1.3	Explain evolution of populations	
1...		
2	**Skills**	
2.1	Ability to measure population variability.	
2.2	Predict and explain the ecological and evolutionary factors that influence the genetic structure of populations	
2.3		
2...		
3	**Competence**	
3.1	Be able to prepare a research project	
3.2		
3.3		
3...		

* Program Learning Outcomes

C. Course Content

No	List of Topics	Contact Hours
1	Genetic structure of the population	6
2	Forces of gene frequency changes	6
3	Evolution of DNA Sequencing	3
4	Small populations	3
5	Measurements of variability	6
6	Resemblance between relatives	3
7	Heritability	6
8	Selection	6
9	Inbreeding and cross breeding	3
10	Metric traits	3
11	BLUB estimation	3
Total		48

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	Comprehend the basic of quantitative and population genetics.	Lectures	Oral test, written exams
1.2	Describe the genetic population structure	Lectures	Oral test written exams
…	Explain evolution of populations	Lectures	Oral test written exams
2.0	**Skills**		
2.1	Ability to measure population variability.	Comparison of the different parameters that can be used to measure population variability	Oral test written exams
2.2	Predict and explain the ecological and evolutionary factors that influence the genetic structure of populations		
…			
3.0	**Competence**		
3.1	Be able to prepare a research project	presentation using power point	Oral test
3.2			
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Final exam	14 week	40%
2	Midterm exam (with oral presentation)	7 week	30%
3	Midterm exam (with Reports)	7 Week	20%
4	Performance evaluation + attendance	Weekly	10%
5			
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 and e-mail address give students the opportunity to ask in-depth questions and to explore points of confusion or interest.

F. Learning Resources and Facilities

1. Learning Resources

Required Textbooks	Hasan Khatib. 2015. Molecular and Quantitative Animal Genetics ISBN: 978-1-118-67740-7 pages 336 Falconer, D. S. 1981. Introduction to Quantitative Genetics, second ed. London: Longman. Hartl, D. L. And A. G. Clark. 1989. Principles of Population Genetics, second, ed. Sunderland, MA: Sinauer.
Essential Reference Materials	Lecture Notes and data sheets
Electronic Materials	NCBI, EMBL-EBI
Other Learning Materials	GenePop, Genetix Packages: Arlequin, Populus (UMinn)

2. Educational and research Facilities and Equipment Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Smart Room (the lab is equipped with smart board)
Technology Resources (AV, data show, Smart Board, software, etc.)	Lab with PCS and internet connection, Population genetics simulation program
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

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	
Reference No.	
Date	