

Fisheries Biology and Management [296]

COURSE OUTLINE

(1) GENERAL

SCHOOL	ANIMAL BIOSCIENCES		
ACADEMIC UNIT	DEPARTMENT OF ANIMAL SCIENCE		
LEVEL OF STUDIES	Undergraduate [Major Elective]		
COURSE CODE	296	SEMESTER	5th
COURSE TITLE	FISHERIES BIOLOGY AND MANAGEMENT		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	CREDITS (ECTS)
Theory and Laboratory practice		3	3
Total		3	3
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Scientific Area		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS:	-		
COURSE WEBSITE (URL):	https://oeclass.aua.gr/eclass/courses/5032/		
TEACHING STAFF	S. Kalogirou, E. Miliou		

(2) LEARNING OUTCOMES

Learning outcomes
The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described. Consult Appendix A - Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area - Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B - Guidelines for writing Learning Outcomes The aim of the course is to provide students with the necessary skills for understanding fisheries science through dedicated education in important parameters such as age, growth, reproduction, ecology, and population dynamics to be used for stock assessment and sustainable stocks. Upon successful completion of the course, students will be able (according to Bloom) to: - Demonstrate knowledge of fisheries production, including principles of sustainable management (Knowledge / Comprehension). - Identify fish species using external morphology and understand morphometric relationships (Knowledge / Comprehension / Application). - Determine age and assess maturity of fish species (Application / Analysis). - Apply statistical and other quantitative methods to estimate growth parameters and fecundity of fish species (Application / Analysis). - Utilize FishBase (www.fishbase.org) and the United Nations (UN) fisheries database (FishStatJ) for species identification and fisheries data analysis (Application / Evaluation). - Integrate ecological principles and fisheries dynamics to propose justified management strategies (Analysis / Synthesis / Evaluation). - Work effectively in laboratory groups to complete practical tasks (Application / Collaboration). - Participate in educational visits and relate practical observations to theoretical knowledge (Application / Comprehension).
General Competences
Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear

below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information,
with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender
issues
Criticism and self-criticism
Production of free, creative and inductive thinking
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Others...
.....

- Search, analysis and synthesis of data and information, utilizing modern technologies
- Adaptation in various conditions
- Decision-making
- Independent personality
- Teamwork skills
- Project planning and management
- Consideration for the natural environment
- Develop judgement and self-criticism
- Promotion of free, creatinal and inductive thinking

(3) SYLLABUS

Theory

1. Basic concepts of stock
2. Fishing gears and selectivity
 - Sampling without fishing gears
 - Sampling with fishing gears
 - Selectivity of fishing gears
 - Effectiveness of fishing gears
3. Production processes and fisheries resources
 - Primary production
 - Heterotrophic production
 - Fishery production
 - Main species caught
 - Fishing areas
 - Climate and fish stocks
4. Fisheries categories and fishing effort
 - Fishery production and effort
 - Catches = landings + discards
 - Target species, bycatch and unintentional catch
 - Ghost fishing
 - Fishing effort and indicators
 - Maximum Sustainable Yield (MSY)
5. The effect of fisheries
 - The impact of fisheries on commercial stocks and bycatch
 - Impact of fisheries on non-fished organisms
 - The effect of non-targeted organisms on fisheries
 - The effect of fisheries on the ecosystem
 - Selective or balanced exploitation?
 - Fisheries and aquaculture
 - Good environmental status
6. Age
 - Age determination
 - Validity of age determination – methods
 - Recursive calculation
 - Age-length key
 - Longevity
7. Growth
 - Length-weight ratio
 - Condition
 - What is a growth?
 - Growth models
 - Growth parameter estimation methods
8. Mortality
 - Types of mortality
 - Numerical expression of mortality

• Total mortality estimation methods • Natural instantaneous mortality estimation methods • Fisheries instantaneous mortality and exploitation rate
9. Reproduction • Gender ratio • Season (start and duration) of reproduction • Stages of genital maturation • First genital maturation • Age of first maturity • Fertility
10. Nutrition • Diet composition • Fractional trophic level • Trophic level and uses
11. Assessment and management of fish stocks • Maximum Sustainable Yield (MSY) • Assessment methods (monospecific, multispecific, ecosystemic) • Fisheries models (age based, surplus production) • Fisheries policy (CFP, MSFD)
Laboratory • Practical exercise in fisheries production • Understanding applied measurements of external morphology of fish species and allometric relationships • Age reading and fecundity estimation • Applied statistical methods for estimation of parameters of growth, mortality and dynamics • Use of FishBase (www.fishbase.org) for species identification and other uses • Practical use of UN fisheries base (FishStatJ) • Practical exercise in ecology and dynamics of species and management of stocks

(4) TEACHING and LEARNING METHODS - EVALUATION

TEACHING METHOD <i>Face-to-face, Distance learning, etc.</i>	Physical and online (if necessary)	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	• PowerPoint slides • Support through e-class platform • e-mail and announcements through the e-student platform • MS Teams (if necessary)	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	26
	Laboratory practice focusing on methodology implementation and case studies in small student groups	13
	Individual study of students	36
	Course total (25 h of workload per ECTS)	75
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	I. Lectures (a) Non mandatory lectures. (b) Final written examination with 70% contribution to the total grade.	
	II. Laboratory (a) Mandatory laboratory exercises. (b) Evaluation of skills in exercises and group presentation.	
	III. Language for exams in Greek.	
	IV. Criteria for evaluation provided to students.	
	V. Finalized laboratory exercises will contribute 30% to the total grade.	

(5) ATTACHED BIBLIOGRAPHY

Recommended Literature for Theory:

(A) Related scientific journals:

- Fish and Fisheries
- Reviews in Fish Biology and Fisheries
- Fisheries Research

(B) Digital Educational Materials (e-class):

1. S. Kalogirou. Introduction to Fisheries and Fisheries Science (lecture presentation, ppt), Department of Animal Science, AUA
2. S. Kalogirou. Fishing gears and selectivity (lecture presentation, ppt), Department of Department of Animal Science, AUA
3. S. Kalogirou. Production processes and fisheries resources (lecture presentation, ppt), Department of Department of Animal Science, AUA
4. S. Kalogirou. Fishing categories and fishing effort (lecture presentation, ppt), Department of Department of Animal Science, AUA
5. S. Kalogirou. The effect of fishing on organisms and the ecosystem. Overfishing (lecture presentation, ppt), Department of Department of Animal Science, AUA
6. S. Kalogirou. Reproduction of Fishes (lecture presentation, ppt), Department of Department of Animal Science, AUA

(C) Recommended Textbooks (EVDOXOS): • STERGIOU K.I., TSIKLIRAS AC. 2016. FISHERIES BIOLOGY AND FISHERIES. ASSOCIATION OF GREEK ACADEMIC LIBRARIES. Book Code in Evdoxos: 320236, Edition: 1/2016, ISBN: 978-960-603-235-6, e-book <https://repository.kallipos.gr/handle/11419/2685>

Recommended literature for lab work:

(A) Useful websites

1. Search FishBase
2. Fisheries and Aquaculture (europa.eu)
3. STECF - European Commission (europa.eu)
4. Fisheries and Aquaculture - Fisheries and Aquaculture - FishStatJ - Software for Fishery and Aquaculture Statistical Time Series (fao.org)

(B) Digital educational material (e-class):

1. Kalogirou S. Practical exercise in fisheries production (lectures in pdf)
2. Kalogirou, S. Understanding applied measurements of external morphology of fish species and allometric relationships (lectures in pdf), Dep. of Animal Science, AUA
3. Kalogirou, S. Age reading and fecundity estimation (lectures in pdf), Dep. of Animal Science, AUA
4. Kalogirou, S. Applied statistical methods for estimation of parameters of growth, mortality and dynamics (lectures in pdf), Dep. of Animal Science, AUA
5. Kalogirou S. Use of FishBase (www.fishbase.org) for species identification and other uses. (lectures in pdf), Dep. of Animal Science, AUA
6. Kalogirou S. Practical use of UN fisheries base (FishStatJ) (lectures in pdf), Dep. of Animal Science, AUA
7. Kalogirou S. Practical exercise in ecology and dynamics of species and management of stocks (lectures in pdf), Dep. of Animal Science, AUA
8. Kalogirou S. Practical exercise in mortality estimation (lectures in pdf), Dep. of Animal Science, AUA
9. Kalogirou S. Practical exercise in reproductive maturity (lectures in pdf), Dep. of Animal Science, AUA
10. Kalogirou S. Practical exercise in diet analysis (lectures in pdf), Dep. of Animal Science, AUA
11. Kalogirou S. Practical exercise in assessment of management of stocks (lectures in pdf), Dep. of Animal Science, AUA