COURSE LAYOUT

1. GENERAL

SCHOOL	Animal Biosciences
DEPARTMENT	Animal Science
STUDY LEVEL	*Undergraduate*
COURSE CODE	296

COURSE CODE	296	**SEMESTER**	5th

DEPERTMENT IN WHICH IT IS TAUGHT	Animal Science (Elective)
COURSE TITLE	Fisheries biology and management

INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	ECTS
Theory	2	2
Laboratory practice	1	1
		3

COURSE TYPE (Foundation course, General knowledge, Scientific area, Developing skills)	Scientific area
PREREQUISITES	NO
LANGUAGE	Greek
IS THE COURSE OFFERED for ERASMUS STUDENTS?	NO
COURSE WEB PAGE	https://oeclass.aua.gr/eclass/courses/5032/
TEACHING STAFF	Theory: S. KALOGIROU Laboratory: S. KALOGIROU

2. LEARNING OUTCOMES

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.

- Specifically, students will have knowledge in 1) fisheries production, 2) external morphology of fish and morphometric relationships, 3) age reading and maturity of fish species, 4) application of statistical and other approaches for estimation of growth parameters and fecundity of species, 5) use of the largest FishBase (www.fishbase.org) and its application for identification as well as United Nations (UN) fisheries database (FishStatJ). Ecology and fisheries dynamics will in parallel be used for providing justified fisheries management approaches.

- Laboratory working groups will be formed.

- An education visit is also included in the course.

General Competences
• 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, creational and inductive though

3. COURSE CONTENT (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	Physical and online (if necessary)
USE OF INFORMATICS and COMMUNICATION TECHNOLOGIES	• PowerPoint slides • Support through e-class platform • e-mail and announcements through the e-student platform • MS Teams (if necessary)

TEACHING ORGANISATION (Lectures, individual or group assignments, field trips, individual study et.c.)	Activities	Workload per semester
	Lectures	26
	Laboratory practice focusing on methodology implementation and case studies in small student groups	13
	Team projects on a case study	
	Field trip/ Personal assignment	
	Individual study	36
	Total contact hours and training	**75**

STUDENTS EVALUATION	I. Lectures (a) Non mandatory lectures. (b) Final written examination with 70% contribution to the total grade. II. Laboratory (a) Mandatory laboratory exercises. (c) Evaluation of skills in on exercises and group presentation. III. Language for exams in Greek. IIII. Criteria for evaluation provided to students. IV. Finalized laboratory exercises will contribute with 30% to the total grade.

5. RECOMMENDED LITERATURE

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