Immunology and Applications in Animal Science [336]

COURSE OUTLINE

(1) GENERAL

SCHOOL	ANIMAL BIOSCIENCES		
ACADEMIC UNIT	DEPARTMENT OF ANIMAL SCIENCE		
LEVEL OF STUDIES	Undergraduate [Free Elective]		
COURSE CODE	336	**SEMESTER**	9th
COURSE TITLE	IMMUNOLOGY AND APPLICATIONS IN ANIMAL SCIENCE		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
Theory	1	1
Laboratory practical	1	1
Total	**2**	**2**
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background
PREREQUISITE COURSES:	--
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS:	Yes
COURSE WEBSITE (URL):	https://oeclass.aua.gr/eclass/courses/6178/
TEACHING STAFF:	A. Hager (a.hager@aua.gr), I. Politis, G. Theodorou, G. Stefos

(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 success of livestock practices and management depends on the proper functioning of the immune system. The course "Immunology in Animal Production" aims to familiarize students with the functioning of the immune system during critical phases of development and reproduction in farm animals, as well as under different rearing and stress conditions. The objective of the course is for students to acquire the necessary theoretical background to understand the interaction of the immune system with feeding and management practices, so they can select appropriate livestock practices that ensure optimal immune system function to safeguard the health of livestock.

Upon successful completion of the course, students will be able (according to **Bloom's Taxonomy**) to:

- Describe the normal function and responses of the immune system under different physiological and environmental conditions (**Knowledge / Comprehension**).
- Understand the interaction between the immune system and nutrition, with emphasis on critical developmental stages that influence long-term immune performance (**Comprehension / Analysis**).
- Understand the immune mechanisms during the perinatal period and the specific features of mammary gland immunity in dairy animals during lactation and the dry period (**Comprehension / Analysis**).
- Recognize and explain how the immune system is affected by livestock management practices, nutritional interventions, and rearing conditions (**Application / Analysis**).
- Appreciate and apply knowledge on maternal care to establish passive immunity in newborns (**Application / Evaluation**).
- Identify and assess stressors (e.g., heat stress, stocking density) and other factors that suppress or enhance immune function (**Analysis / Evaluation**).
- Apply their understanding to design, select, and implement appropriate management practices that strengthen and protect immune function at the farm level (**Application / Synthesis**).

- Integrate immunological and nutritional knowledge to collaborate effectively with professionals (e.g., veterinarians) on optimizing immunity in livestock production systems (**Synthesis / Evaluation**).

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	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*.....*
Production of new research ideas	*Others...*
	.....

- Independent work
- Teamwork
- Critical thinking and self-assessment
- Promotion of free, creative, and inductive thinking
- Work in an interdisciplinary environment

(3) SYLLABUS

- Basic principles of immune system function, linking with prior knowledge. Biomarkers of immune homeostasis and function
- Function of the immune system during the perinatal period in farm animals
- Immunity in the fetus and neonate
- Immunity in the mammary gland of dairy animals; immune system during the dry period
- Immune system and heat stress
- Immune system and general stress
- Welfare parameters and immunity
- Genetic factors and immunity: the example of breed effects
- Interaction between the immune system and nutrition: early-life nutrition with lasting effects on immune function
- Effect of nutrition on the immune system: the case of vitamin E in dairy cows
- Effect of trace elements, vitamins, and other dietary additives on immune regulation
- Microbiome and immunity

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY
Face-to-face, Distance learning, etc.

Face to face

USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students

Use of ICT in teaching, laboratory practicals, and communication with students.

Support of the learning process through the e-class online platform for the distribution of educational material (lectures, useful links, etc.), for the implementation of theoretical exercises and assignments, for self-assessment activities, and for the weekly and final evaluation of students.

TEACHING METHODS
The manner and methods of teaching are described in detail.
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.

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

Activity	***Semester workload***
Lectures	24
Laboratory practicals in small groups	6
Self-assessment exercises	5
Writing and presenting an assignment in the classroom	5
Individual study	10
Course total (25 h of workload per ECTS)	**50**

STUDENT PERFORMANCE EVALUATION
Description of the evaluation procedure

Theory
- 20% Weekly assessments using multiple-choice questions
- 20% Individual written assignment

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 *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	• 60% Final examination consisting of short-answer and multiple-choice questions Laboratory practicals • 50% Based on the evaluation of the execution of each laboratory exercise • 50% Based on responses to questions following each exercise

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Veterinary Immunology, Ian R. Tizard, 11th Edition, 2024, Saunders, Paperback ISBN: 9780443109751, eBook ISBN: 9780443111617

- Related academic journals:

- Veterinary Immunology and Immunopathology
- Frontiers in Veterinary Science
- Research in Veterinary Science
- Comparative Immunology, Microbiology and Infectious Diseases
- American Journal of Veterinary Research
- Animal
- Journal of Animal Science
- Journal of Animal Science and Biotechnology
- Journal of Dairy Science
- Journal of Dairy Research
- Poultry Science
- Animal Production Science