

**COURSE DATA****Data Subject**

Code	43059
Name	Histology and histopathology of bioindicator animals
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2023 - 2024

Study (s)

Degree	Center	Acad. year	Period
2139 - M.U. en Contaminación, Toxicología y Sanidad Ambient. 12-V.2	Faculty of Biological Sciences	1	Second term

Subject-matter

Degree	Subject-matter	Character
2139 - M.U. en Contaminación, Toxicología y Sanidad Ambient. 12-V.2	3 - Environmental toxicology	Optional

Coordination

Name	Department
AGUSTIN PAVON, MARIA CARMEN	357 - Cellular Biology, Functional Biology and Physical Anthropol.
PONSODA I MARTI, XAVIER JOSEP	357 - Cellular Biology, Functional Biology and Physical Anthropol.

SUMMARY

The subject "Histology and Histopathology of Bioindicator Organisms" is responsible for transmitting basic knowledge about the principles of cell injury and pathogenesis related to toxins and contaminants in vertebrates and invertebrates. The course will study the basic procedures and techniques for the preparation of samples and tissues as well as the techniques of embedding, staining and cutting (microscopic techniques)



PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

OUTCOMES

2139 - M.U. en Contaminación, Toxicología y Sanidad Ambient. 12-V.2

- Students should demonstrate self-directed learning skills for continued academic growth.
- Students should possess and understand foundational knowledge that enables original thinking and research in the field.
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- Capacidad de análisis, síntesis y razonamiento crítico en la aplicación del método científico.
- Capacidad para el aprendizaje autónomo y organizado y para la adaptación a nuevas situaciones.
- Comprender los mecanismos de toxicidad de contaminantes.
- Conocer los modelos animales para el estudio de enfermedades humanas.

LEARNING OUTCOMES

SKILLS TO BE ACQUIRED.

- Correct handling of scientific terminology and familiarization with sources of information.
- Ability to analyze data, choose the appropriate method, evaluate and critically interpret experimental results in their various forms of expression (tables, graphs, etc.).
- To acquire the capacity of synthesis to be able to gather, in an organized and coherent way, information or data from different sources.
- To know how to use the basic scientific instrumentation of microscopic techniques.

SOCIAL SKILLS

- To develop capacity for critical thinking, encouraging communication and discussion in order to stimulate individual creative capacity.
- Ability to work in a group when facing problematic situations collectively.
- Ability to construct an understandable and organized written text.
- Ability to express oneself orally before a public audience, for example the class itself, through exposition or intervention in a debate on a controversial topic or issue.
- Ability to interact with both teacher and peers.
- Interest in the social and economic application of science and in particular of Environmental Toxicology.



- Interest in the popularization of science and the impact of science on the culture and consciousness of society.
- Professional training. Acquisition of scientific and technical knowledge related to histology and microscopy that will facilitate the work in Environmental Toxicology in a society in continuous technological advancement.

DESCRIPTION OF CONTENTS

1. Theory lessons

Topic 1: Working with biomarker animals. The 3R principle in the work with laboratory animals. Introduction to Histology and Histopathology. Types of tissues.

Topic 2: HISTOLOGICAL AND MICROSCOPIC TECHNIQUES. Preparation of histological specimens. Microtomy. Basic, immunohistochemical and immunofluorescent stains. Brightfield, fluorescence, confocal and electron microscopy.

Topic 3: COMPARATIVE HISTOLOGY and HISTOPATHOLOGY. Digestive system.

Topic 4: COMPARATIVE HISTOLOGY and HISTOPATHOLOGY. Respiratory system.

Topic 5: COMPARATIVE HISTOLOGY and HISTOPATHOLOGY. Integumentary system.

Topic 6: COMPARATIVE HISTOLOGY and HISTOPATHOLOGY. Excretory system.

Topic 7: COMPARATIVE HISTOLOGY and HISTOPATHOLOGY. Nervous system.

Topic 8: COMPARATIVE HISTOLOGY and HISTOPATHOLOGY. Endocrine system

2. PRACTICAL LESSONS

Topic 1. The histological technique: preparation of specimens for microscopic observation.

Topic 2. Observation and identification of histological specimens.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	21,00	100
Study and independent work	18,00	0
Readings supplementary material	11,00	0
Preparation of evaluation activities	16,00	0
TOTAL	66,00	

TEACHING METHODOLOGY

The subject is structured as follows:



1. Theory lectures to develop the fundamental knowledge and methodology to be used.
2. Practical and demonstrative sessions in which practical aspects of the usual procedures in the histology and histopathology laboratory will be addressed.
3. Seminars, which are carried out in groups of a few students. The professor will propose some topics from which the students will be able to choose. The students will look for the bibliography and will develop a work that they will present orally to the rest of the students and to the teacher, opening a debate at the end. The expositions will be carried out during the class period.
4. In all activities the virtual classroom of the Universitat de València will be used for the exchange of documents and communication.

EVALUATION

- Written exam on theory and/or practical classes: based on the learning outcomes and the specific objectives of the subject. The exam represents 60% of the final grade.
- Preparation of a paper and its defense on a topic related to the subject, the quality of the oral presentation, the document used in the presentation and the knowledge of the subject will be evaluated. Represents 30% of the final grade
- Continuous evaluation of the student in theory classes, laboratory and seminars: participative attendance, handling of material and equipment, organization of the work, comprehension and understanding of the practice guide, performance of calculations, teamwork, etc. Represents 10% of the final grade.

REFERENCES

Basic

- Pawlina, W. (2020). Ross. Histología. Texto y Atlas color con Biología Celular y Molecular. 8ªed. Ed. Wolters Kluwer
- Sobotta-Welsch U. (1999). Histología (atlas en color de anatomía microscópica). 5ª ed. Marbán
- Young, B., Heath, J.W. y Woodford, P. (2014). Wheaters Histología funcional. Texto y Atlas en Color.6ª ed. Elsevier.
- Young, B., Stewart, W. y ODowd, G. (2014). Wheaters Basic Pathology. A Text, Atlas and Review of Histopathology .5ª ed. Elsevier

Additional

- <http://histology-world.com/>



- <http://www.udel.edu/biology/Wags/histopage/histopage.htm>
- <http://www.deltagen.com/target/histologyatlas/HistologyAtlas.html>

