

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

Code	43059
Name	Histology and histopathology of bioindicator animals
Cycle	Master's degree
ECTS Credits	3.0
Academic year	2019 - 2020

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
PERTUSA GRAU, JOSE FRANCISCO	23 - Functional Biology and Physical Anthropology

SUMMARY

La asignatura “Histología e histopatología de organismos bioindicadores” se encarga de transmitir conocimientos básicos sobre los principios de lesión celular y patogénesis relacionada con tóxicos y contaminantes en vertebrados e invertebrados. El componente práctico es muy importante porque se plantea como una ayuda a la detección de tóxicos ambientales, por su impacto en los seres vivos

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 be able to integrate knowledge and address the complexity of making informed judgments based on incomplete or limited information, including reflections on the social and ethical responsibilities associated with the application of their knowledge and judgments.
- 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.
- Comprensión del mundo natural como producto de la evolución y de su vulnerabilidad frente a la influencia humana.
- Desarrollo de un compromiso ético y capacidad de participación en el debate social.
- Comprender los mecanismos de toxicidad de contaminantes.
- Diseñar bioensayos de ecotoxicidad en suelos y aguas.
- Realizar ensayos del ciclo de vida.
- Diseñar planes de biorremediación.
- Valorar los efectos del cambio climático.
- Planificar la explotación racional de los recursos naturales renovables terrestres y acuáticos.
- Conocer los modelos animales para el estudio de enfermedades humanas.
- Diseñar los indicadores específicos para un riesgo ambiental concreto.

LEARNING OUTCOMES

SKILLS TO ACQUIRE.

- To handle scientific terminology properly and become familiar with their sources.
 - To get an integrated view of the defense mechanisms of adaptation to the environment of animals.
- Make sense of foreground, interrelate and apply.
- Ability to analyze data, choosing the right method, critical evaluation and interpretation of experimental results in various forms of expression (tables, graphs ...).



- Acquire synthesis capacity to collect, coherently and in an organized way, information or data of different origins.
- Meet the management of basic scientific instrumentation typical of Applied Physiology.

SOCIAL SKILLS

- Develop capacity for critical thinking, fostering communication and discussion with a view to stimulating individual creative ability.
- Ability to work in groups when dealing with problematic situations collectively.
- Ability to build a comprehensive text written and organized.
- Ability to speaking to a public audience, such as the class itself, by exposure or intervention in a debate on a topic or controversial issue.
- Ability to interact with both the teacher and with peers.
- Interest in social and economic application of science and in particular the Environmental Toxicology.
- Interest in popular science and the impact of science on culture and consciousness of society.
- Professional training. Acquisition of scientific and technical knowledge related to resistance to xenobiotics that will facilitate the work in Environmental Toxicology in a society in continuous technological progress.

DESCRIPTION OF CONTENTS

1. Theory

Lesson 1: Basic principles of the the Histopathology of animal indicators

Lesson 2: The methodology applied to the Histopathology and the importance of the diagnosis in the adequat.

Lesson 3: Diagram of the normal histology of vertebrates and invertebrates bioindicators.

Lesson 4: Principal histopathological alterations

Lesson 5: Nuclear and cytoplasmic effects on chemical toxics and radiation ionization.

2. PRACTICAL SESSIONS

1.- Visit to the microscopy section of the SCSIE-UV

2.- Visit to the SCSIE-UV cell culture section

3.- Practical session in computer classroom. Image processing with ImageJ

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Theory classes	21,00	100
Development of group work	7,00	0
Study and independent work	12,00	0
Preparation of evaluation activities	16,00	0
Preparing lectures	10,00	0
TOTAL	66,00	

TEACHING METHODOLOGY

- Master class for acquiring the fundamental knowledge, including methodological aspects.
- Practice class on the evaluation of pollution effects.
- Students will work in groups (of 2 or 3 people) on specific subjects proposed by the lecturer, finally showing their results in an oral presentation to the rest of the class.
- A tutorship of 1.5 hours will be carry out in the class. On the other hand, other tutored sessions will be available by e-mail or using the “aula virtual” tool.
- All activities and master classes are reinforced with documentation and information exchanges between lecturers and students using the “aula virtual” tool of the Universitat de València webpage.

EVALUATION

Written exam on the theoretical and practical classes: based on the learning outcomes and the specific objectives of each subject. The theory exam represents 60% of the final grade

Continuous assessment of the student in theory, laboratory and seminar classes: participatory assistance, material and equipment manipulation, work organization, understanding and use of the practical guide, calculations, team work, etc. Represents 40% of the final grade

REFERENCES**Basic**

- Wheater, Burkitt and Daniels. 2002. Histología Funcional. Ed Jims



- Técnicas de Histología Animal. R. Martoja and M. Martoja. Ed. Toray-Masson
- Stevens, Lowe and Young. 2002. Histopatología Básica. Ed Elsevier

Additional

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

ADDENDUM COVID-19

This addendum will only be activated if the health situation requires so and with the prior agreement of the Governing Council

English version is not available