Teaching guide

IDENTIFICATION DETAILS

Degree:	Biomedicine
Scope	Biology and Genetics
Faculty/School:	Experimental Sciences
Course:	HISTOLOGY
Type:	Basic Training
ECTS credits:	6
Year:	2
Code:	2146
Teaching period:	Fourth semester
Subject:	Human Anatomy
Module:	Structural and Functional Bases of Biomedicine
Teaching type:	Classroom-based
Language:	Spanish
Total number of student study hours:	150

SUBJECT DESCRIPTION

Human histology is the branch of biology that studies the morphology, structure and non-pathological function of tissues at the microscopic level. It is a four-month course of 6 ECTS credits.

Understanding this subject will help students to understand and relate ultrastructural morphology to macroscopy (anatomy), its embryological origin and the physiology learned in other disciplines of the Degree, as well as to establish the basis for tackling subjects with a more clinical orientation studied in subsequent courses. In this way, the student will have a coherent vision of biomedicine, both in health conditions and in physiopathological aspects.

For this purpose, both theoretical knowledge and basic histological terminology will be necessary, as well as the handling of materials useful for microscopic study and the techniques used in the preparation and preparation of

histological preparations, for their correct diagnosis, as well as a skill in bibliographic search in scientific texts.

GOAL

The objective of this course is the recognition and diagnosis of the cells, tissues and organs of the human body at the microscopic level and the training to relate this ultrastructure to its macroscopic morphology and function.

The specific aims of the subject are:

1) Know the different tissues of the human body, their classification, their components, cell types, characteristics and functions.

2) Know the structure and ultrastructure of the organs and their arrangement in the different organs and body systems, as well as the normal morphofunctional relationship.||3) Recognize with microscopic methods and imaging techniques the morphology and structure of each of the organs and systems.

4) Know and know how to use the methodology and instrumentation necessary to carry out such microscopic observation.

PRIOR KNOWLEDGE

In order to relate macroscopic aspects to microscopic morphology, in addition to understanding the origin of tissues, previous knowledge of basic anatomy and embryology is desirable, as well as knowledge of biochemistry, cell biology and physiology that aid in the conceptual structure-function association of these tissues. In addition, prior knowledge of the English language is very convenient in order to deepen the specific bibliography of the subject.

COURSE SYLLABUS

THEORETICAL SYLLABUS:
1- Introduction. Fabric concept. Types and embryonic origin. Methods for studying histology: histological sample preparation procedure.
Block I: EPITHELIAL TISSUES
2- Epithelial tissue I. Definition. Features. Types and functions of lining epithelia.
3- Epithelial tissue II. Classification, functions and types of glandular epithelia.
Block II: CONNECTIVE TISSUES
4- Connective tissue itself. Components: cells and extracellular matrix. Types of connective tissue.
5- Adipose tissue. Features and types.
6- Cartilaginous tissue. Types, characteristics, components and histological organization.
7- Bone tissue. Structure. Components. Ossification and bone remodeling.
8- Blood tissue. Cell composition and types.
9- Hematopoietic tissue. Blood cell formation and maturation. The bone marrow.
Block III: MUSCLE TISSUE
10- Muscle tissue. Histological organization and components of the muscle fiber. Skeletal, cardiac and smooth

muscle.
Block IV: NERVE TISSUE
11- Nervous tissue. Features and organization. Neuron, glia and synapse.
PRACTICAL SYLLABUS:
1- General concepts about the preparation, staining and observation of samples and the optical microscope.
2- Lining and glandular epithelial tissue
3- Connective tissue itself
4- Adipose tissue
5- Cartilaginous tissue
6- Bone tissue
7- Blood
8- Lymphatic tissue
9- Muscle tissue
10- Nervous tissue

EDUCATION ACTIVITIES

The methodology of the Histology course will be as follows:
AF1) Presentation by the teacher of theoretical contents and discussion and interpretation of them with the students. Additionally, in person, self-evaluation, review and reinforcement exercises will be carried out both individually and together in the classroom. In the Virtual Classroom, students will find study material consisting of presentations (computer support), videos, abstracts, articles, links to web pages and additional teaching material. The student, through the Virtual Classroom, will also have access to the self-evaluation, review and reinforcement exercises that they have been able to carry out in person in the classroom. Exercises and open questions may also be offered on a regular basis, whose content will be directly related to the subject, as well as others with a more general content and which will help the student to relate Histology to other subjects of the degree.
AF3) Among the face-to-face activities, personal and/or group tutoring classes are included for the resolution of doubts at the agreed time between teacher and student (s).
AF4) Conducting practical sessions based on the study of histological preparations in the laboratory using an optical microscope and through the student's autonomous work using virtual microscopy (whose material will be provided by the teacher well in advance). The students, working in a cooperative format, will learn how to analyze these preparations and will prepare a laboratory notebook in which they reflect their work of observing and identifying cells, tissues and structures in the organs provided to them in these histological preparations. This laboratory notebook can be completed using digital resources through virtual microscopy: students will learn how to use it and will jointly carry out the analysis and identification of these preparations.
AF5) Formative evaluation through group cooperative work of the student in which the level of learning of the practical work carried out in the laboratory and autonomously by the student is verified thanks to the material provided and the use of virtual microscopy.
The teachers of the subject do not authorize the publication, by the student, of the material provided by the teachers of the subject in the virtual classroom, or by any other means.

DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK
60 Horas	90 Horas

LEARNING RESULTS

Know the structural organization of the main tissues in the human body, and their levels of organization in the formation of organs and systems.

Recognize by microscopic observation the different cell types and their basic components.

SPECIFIC LEARNING RESULTS

(RA 1) Use the specific laboratory material of a Histology laboratory, that is, the correct manipulation of both the optical and virtual microscopes

(RA 2) Identify and distinguish the different tissues that are part of human organs and systems through the microscopic observation of histological preparations

(RA 3) Inferring the functionality of tissues based on their morphology and integrating the concepts learned in previous subjects such as cell biology, physiology and anatomy.

(RA 4) List the different types of tissues that a human organism is composed of. Classify subtypes and describe their components.

(RA 5) Recognize the different organs based on histological sections: presence and structural arrangement of the tissues of which they are composed as well as their assignment to their corresponding system/apparatus

LEARNING APPRAISAL SYSTEM

The evaluation system will be as follows:
1) ORDINARY evaluation system
- Evaluation of the theoretical content of the subject through oral or written tests with development, short answer or test-type questions: 50% (corresponding to the evaluation of learning outcomes RA3 to RA6). A minimum score of 5 on this exam (in a range of 0 to 10) will be required to average the rest of the grades in the subject. And, under no circumstances, can the subject be considered passed if a minimum score of 5 points (range from 0 to 10) is not obtained in that theoretical part of the subject.
- Evaluation of practical microscopy work: 40% (corresponding to the evaluation of learning outcomes RA1 to RA3 and RA5, RA6). It will be evaluated by:
a) carrying out a group practice exam, once these have been completed, in which the help provided by the laboratory practice book (20%) can be used and
b) taking a written or oral exam at the end of the course (20%). A minimum score of 5 on this exam (in a range of 0 to 10) will be required to average the rest of the grades in the subject.
ATTENDANCE AT PRACTICAL LABORATORY SESSIONS (INCLUDING THE DAY OF THE GROUP EXAM) IS MANDATORY TO PASS THE SUBJECT. The unjustified absence from any of these sessions will be a sufficient reason for the student not to pass the course in the Ordinary Call. Under certain circumstances, the existing Regulations will be applicable to allow passing the subject in the Extraordinary Call (consult conditions with the

teacher of the subject).
It will be necessary to obtain a minimum score of 5 (grade range from 0 to 10) in the joint evaluation of practical work (both exams) in order to average with the rest of the grades.
- Carrying out exercises, practical cases or evaluation tests in class or in the virtual classroom: 10% (corresponding to the evaluation of learning outcomes RA4 and RA6).
If you have not passed the subject in the first call, the grades of the approved parts will be saved until the extraordinary call.
2) ALTERNATIVE evaluation system
This system is intended for repeat students who do not take advantage of the ordinary evaluation system because they are unable to attend classes on a regular basis. Students in second enrollment (or subsequent enrollment) should contact the teacher to request to take advantage of this system. The alternative evaluation will consist of a final exam (60%) and the qualification of the practical part (40%). As for the evaluation of the practices of the course, it will be the same as in the first call, and this grade will be saved if it is approved during the next academic year. In cases of third enrollment or higher, the completion of the internship and its corresponding evaluation will have to be repeated again.
Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with those established in the Evaluation Regulations and the University's Coexistence Regulations.

ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:
a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.
b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.
c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website(https://www.ufv.es/gestion-de-la-informacion_biblioteca/).
d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.
2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the Guide for the Responsible Use of Artificial Intelligence in Studies at UFV. Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.
3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

BIBLIOGRAPHY AND OTHER RESOURCES

Basic

Ross, Michael H. Histology: text and atlas: correlation with cellular and molecular biology/7th ed. Philadelphia:Wolters Kluwer, 2015.

Kierszenbaum, Abraham L. Histology and Cell Biology [Electronic Resource]/4th ed. Madrid:Elsevier, 2016.

(Kierszenbaum, Abraham L. Histology and Cell Biology [Electronic Resource]/4th ed. Madrid:Elsevier, 2016. , ||Barbara Young, Geraldine ODowd, Phillip Woodford. Wheater [Electronic resource]: functional histology/6th ed. Madrid: Elsevier, 2014.)

Additional

Annemarie Brüel... [et al.]. Geneser histology/Madrid: Panamericana, 2015.

Gartner, Leslie P. Histology text [Electronic Resource]/4th ed. Madrid: Elsevier, 2017.

Welsch, Ulrich. Sobotta: histology/3rd ed. Mexico City: Editorial Médica Panamericana, 2014.
(Welsch, Ulrich. Sobotta: histology/3rd ed. Mexico City: Editorial Médica Panamericana, 2014. , ||Ovalle, William K. Netter [Electronic Resource] :Essential Histology/Madrid: Elsevier, 2021.)