

Animal Histology

Code: 107542
ECTS Credits: 3

2025/2026

Degree	Type	Year
Microbiology	OB	1

Contact

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Teaching groups languages

You can view this information at the [end](#) of this document.

Prerequisites

Sufficient knowledge of Biology during secondary school.

Erasmus students should consider that lessons are taught in Català.

Objectives and Contextualisation

This first-year mandatory course introduces students to the fundamentals of vertebrate tissue organization. Animal Histology focuses on studying the various cell types and their interrelationships, which constitute animal tissues and their correlation with integrative tissue function.

The specific objectives of this course are:

- To identify the different tissues present in animals.
- To master basic terminology to express concepts and accurately describe cellular structures properly.
- To recognize the diversity of animal cells.
- To name cytophysiological characteristics that define different animal tissues.

Learning Outcomes

1. CM05 (Competence) Evaluate the global dynamics of natural systems at different scales of analysis to provide innovative responses to societal demands and care for the environment.
2. CM06 (Competence) Integrate knowledge and skills from the field of biology, working individually and in groups, to prepare and present in writing or orally and publicly a scientific work.
3. KM08 (Knowledge) Define the structure, organization and functioning of the different types of cells, tissues and physiological systems in living organisms.
4. SM07 (Skill) Characterise the tissues of living organisms attending to the morphology, micro- and ultramicroscopic structure and cytophysiology of their components.

Content

The course content is structured into the following nine topics:

- Topic 1. Concept of animal tissue. Cellular and extracellular components. Intercellular relationships: communication and coordination. Maintenance of tissue integrity. Classification of animal tissues.
- Topic 2. Epithelial tissue. Differentiation of the surface of the epithelial cell. Cellular polarity and intercellular junctions. Basal lamina. Lining epitheliums: structural and physiological characteristics. Types of coating epithelia. Glandular epithelia: types of secretory cells. Classification and general properties of the exocrine glands. Integrative functions of the endocrine glands.
- Topic 3. Connective tissue. Extracellular matrix: fibers and fundamental substance. Fixed and free cells of connective tissue. Fibroblast and fibrogenesis. Mastocytes, plasmocytes, macrophages and mononuclear phagocytic system. Varieties of connective tissue. Epithelial-conjunctive relations.
- Topic 4. Adipose tissue. The adipocyte. Unilocular and multilocular adipose tissue: structure, function and distribution. Nervous and endocrine regulation.
- Topic 5. Cartilaginous tissue. Cartilaginous matrix. Chondrocyte. Varieties of the cartilaginous tissue: hyaline, elastic and fibrous. Histo-physiology and involutive processes.
- Topic 6. Bone tissue. Architectural organization of the bone. Bone matrix Osteoblasts-osteocytes: structure and function. Osteoclast and bone resorption. Histo-physiology. Varieties of bone tissue: laminar and non-laminar. Osteonas, interstitial and circumferential systems. Osteogenesis: intramembranous and endochondral ossification. Bone remodeling.
- Topic 7. Blood. Blood plasma and formed elements. Erythrocyte: structure and function. Thrombocytes and platelets: blood coagulation. Leukocytes. Granulocytes: neutrophils, eosinophils and basophils. Agranulocytes: monocytes and lymphocytes.
- Topic 8. Muscle tissue. Varieties of muscle tissue. Histo-architecture of skeletal muscle. Striated muscle fiber. Contractile device. Myofibrils and sarcomeres. Cytophysiology of muscle contraction. Cardiac muscle fiber. Intercalary discs. Smooth muscle fiber: contraction mechanism.
- Topic 9. Nervous tissue. Neuron: morpho-functional regionalization. Axonic flow. Structural bases of the generation and propagation of the nervous impulse. Interneuronal synapse Neuroglia.

Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Lectures	18	0.72	CM05, KM08, SM07, CM05
Seminars	4	0.16	CM05, CM06, CM05
Type: Supervised			
Tutoring	1	0.04	CM05, KM08, SM07, CM05
Type: Autonomous			
Bibliography	2	0.08	CM05, CM06, KM08, SM07, CM05

Oral presentation	6	0.24	CM06, CM06
Preparation for written work	6	0.24	CM06, CM06
Reading	5	0.2	CM05, KM08, SM07, CM05
Study	30	1.2	CM05, KM08, SM07, CM05

The subject will be taught following the guidelines imposed by the Convergence process towards the creation of a European Higher Education Area (EHEA), endorsed by the Bologna Declaration (1999). This implies a more active participation of students in their learning process, which translates into greater participation of students in class, and more interaction among students and with the teacher. In addition to classroom-based (lectures) methodology, the learning process is completed through remote activities during the school term which translates into an important weight of the final grade of the subject. Teaching methodology and modalities are described as follows:

Master Classes

The theoretical content of the program will be delivered in 18 lectures. The theoretical classes will be complemented by the visualization of cartoons and videos related to the topics covered in class. The teacher's presentations will be available in * pdf format in Moodle.

It is recommended that students print this material and take it to class, to use it as support when taking notes. Although it is not essential to extend the contents of classes, students are advised to consult the books recommended in the Bibliography section regularly to consolidate and clarify, if necessary, the contents explained in class. Some of these theory classes will follow an inverted class pattern where students will have to prepare a material before class to debate in the classroom. Attendance to the inverted class is mandatory.

Seminars

Scheduled seminars are designed for students to work in small groups, and acquire skills of group work and critical thinking. Students will be divided into groups of 4 to 6 to work on a specific topic of the program proposed by the teacher for the subsequent oral presentation and collective discussion. Thus, the follow-up of the seminars will imply an active role of the students in the exposed topics. The organization of the working groups and the distribution of the topics to be discussed will be carried out during the first seminar. In the remaining seminars some groups of students, chosen at random, having prepared the proposed subject, will deliver it in writing to the teacher. The same groups of students will orally present the topic to the rest of the class, with the available means in the classroom. In the seminars, the use of Artificial Intelligence (AI) technologies is permitted as an integral part of the development of the assignment, if final result reflects a significant contribution by the student in terms of analysis and personal reflection. The student must clearly identify which parts were generated using such technology, specify the tools used, and include a critical reflection on how these tools influenced the process and the final outcome of the activity. Lack of transparency in the use of AI will be considered a violation of academic standards and may result in a penalty in the activity grade, or more severe sanctions in serious cases.

For the preparation of the seminars, the students should use the appropriate bibliography, as well as the scientific papers related to the topics.

Attendance at seminars is mandatory. In case of missing class for cause not justified there will be a penalty in the note of the seminars.

Tutorials

Tutorials will be held individually in the faculty office (by appointment). Tutorials should be used to clarify concepts, consolidate acquired knowledge, and facilitate study. They can also be used to resolve any doubts students have about seminar preparation and to improve group dynamics.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continous Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Inverted class	10%	1	0.04	CM05, KM08, SM07
Seminars	20%	0	0	CM06, KM08, SM07
Written test I	35%	1	0.04	CM05, KM08, SM07
Written test II	35%	1	0.04	CM05, KM08, SM07

The evaluation of students' academic performance considers whether they have acquired a level of knowledge, skills, and critical maturity in line with the objectives previously established in the course program. This evaluation process involves assessing the information assimilated, its understanding, and the ability to relate and integrate it with other knowledge, determining whether students are capable of understanding and applying the explained methodologies and techniques, and finally, determining if they can solve experimental problems.

The evaluation of competencies in this subject will be organized into two pathways: (1) Continuous Evaluation and (2) Unique Evaluation.

(1) Continuous Evaluation

Continuous assessment will be conducted through two written exams, a written and an oral assignment, and specific evaluations conducted by the students themselves. The continuous evaluation system is organized into four parts, each of which is evaluated independently and carries a specific weight in the final grade of the subject:

- Inverted Class (10% of the overall grade): During this activity, students will have to answer a questionnaire that will be evaluated and will represent 10% of the mark of the subject.
- First Written Exam (35% of the overall grade): This evaluation assesses the knowledge acquired by each student through a multiple-choice test. This first written exam will cover the first half of the Animal Histology program. Students who score below 4 out of 10 on this exam will not be able to combine it with the grade from the second exam, seminars and the inverted class and will therefore have to take the final make-up exam.
- Second Written Exam (35% of the overall grade): This evaluation individually assesses the knowledge acquired by each student through a multiple-choice test. This second written exam will cover the second half of the Animal Histology program. Students who score below 4 out of 10 on this exam will not be able to combine it with the grade from the first exam, seminars and inverted class and will therefore have to take the final make-up exam.
- Seminars(20% ofthe overall grade): This component assesses the analytical and synthesis skills of the students in each group, as well as their group work and oral presentation skills. The seminars will be evaluated as follows:

Oral presentation	55%	The teacher evaluates (out of 10) the skills of each group of students in the presentation of the work
Report	25%	The teacher evaluates (out of 10) the report delivered by the students on the day of the seminar
Inter-group evaluation	20%	Each group of students evaluates (out of 10) the groups that perform the oral presentation. This evaluation will be carried out in each seminar
TOTAL	100%	

Attendance at seminars is mandatory. In case of missing a seminar without justification, there will be a penalty in the grade:

- absence 1 session = reduction of 20% of the grade.
- absence 2 sessions = reduction of 40% of the grade.
- absence ≥ 3 sessions = reduction of 80% of the grade

To pass the Animal Histology, it is mandatory to obtain a final grade, after the weighting of all the sections (written tests + seminars), equal or superior to 5 points (out of a total of 10).

(2) Unique evaluation

The single assessment will be conducted through a written exam covering the entire syllabus. The seminars are mandatory and follow the same rules and evaluations as explained in the continuous evaluation. The unique evaluation system is organized into three sections, each evaluated independently and contributing a specific weight to the final grade of the course:

- Written Exam (70% of the total grade): This section evaluates the individual knowledge acquired by each student through a multiple-choice exam. This written exam will cover the entire syllabus. Students who score below 4 out of 10 on this exam will not be able to combine this score with the second exam, seminar and inverted class scores, and therefore, will have to take the final recovery exam.
- Seminars (20% of the total grade)
- Inverted class (10% of the global grade)

General Considerations for the Course

A student will receive a "Non-evaluated" grade if they do not attend any of the written exams or do not complete either the oral presentation or the written seminar work.

Students with a score below 5.0 out of 10 will not pass the course. Students who pass the seminars (20% of the course grade) but not the written exams can retain their seminar grade for up to two additional enrollments (three enrollments in total) and will not be required to attend them again.

NB: This text has not been proofreading by a native English, so in case of any doubt or incongruity, the information provided in the Catalan/Spanish version will prevail.

Bibliography

Books

- Fawcett, D.W.: Tratado de Histología (ed. Interamericana-McGraw Hill).
- Gartner, L.P. Hiatt, J.L.: Texto Atlas De Histología, (ed. McGraw Hill).
- Geneser, F.: Histologia (ed. Panamericana).
- Krstic, R.V.: Los tejidos del hombre y de los mamíferos (ed. McGraw Hill).
- Krstic, R.V.: Human Microscopic Anatomy (ed. Springer-Verlag).
- Ross, M.H. y Pawlina, W: Histología. Texto y atlas color con biología celular y molecular (ed. Panamericana).
- Stevens, A. y Lowe, J.: Histología Humana. (ed. Elsevier).
- Welsch. U.: Sobotta Welsch Histología. (ed. Panamericana).

Atlases

- Boya, J.: Atlas de Histología y Organografía microscópica (ed. Panamericana).
- Cross, P.C. y Mercer, K.L.: Cell and tissue ultrastructure. A functional perspective (ed. Freeman and Company).
- Eroschenko, V.P.: Di Fiore's atlas of Histology (ed. Lea and Febiger).
- Gartner, L.P. y Hiatt, J.L.: Atlas color de Histología (ed. Panamericana).
- Kühnel, W.: Atlas color de Citología e Histología (ed. Panamericana).
- Stanley, L.E. y Magney, J.E.: Coloratlas Histología (ed. Mosby).
- Young, B. y Heath, J.W.: Histología funcional (Wheater) (ed. Churchill Livingstone).

Digital atlases

- <http://www.histologyguide.com/>
- <http://histologyatlas.wisc.edu/>
- <https://patologi.com/atlas%20cytologi%20histologi.pdf>
- <http://www.histology-world.com/>
- <https://www.anatomyatlases.org/>
- <https://www.ouhsc.edu/histology/>
- <https://histology.medicine.umich.edu/>
- <https://histologylab.cml.columbia.edu/HistologyLabManual.pdf>

Digital books

- <https://onlinelibrary-wiley-com.are.uab.cat/doi/book/10.1002/3527604669>
- <https://onlinelibrary-wiley-com.are.uab.cat/doi/book/10.1002/9781118789568>

<https://www.visualhistology.com/text-atlas-book/free-online-histology-text-atlas/>

<https://allmedicalpdfs.com/download-wheaters-functional-histology-pdf-6th-edition-latest/>

<https://www.kasem.info/links/text-books>

<https://www.pdfdrive.com/human-histology-books.html>

Relevant literature

Krstic, R.V.: Los tejidos del hombre y de los mamíferos (ed. McGraw Hill).

Krstic, R.V.: Human Microscopic Anatomy (ed. Springer-Verlag).

Ross, M.H. y Pawlina, W: Histología. Texto y atlas color con biología celular y molecular (ed. Panamericana).

<https://www.pdfdrive.com/human-histology-books.html>

Software

The computer software used in Animal Histology is "Microsoft PowerPoint" and "Adobe Acrobat Reader". The digital tool "Wooclap" will also be used.

Groups and Languages

Please note that this information is provisional until 30 November 2025. You can check it through this [link](#). To consult the language you will need to enter the CODE of the subject.

Name	Group	Language	Semester	Turn
(SEM) Seminars	711	Catalan/Spanish	first semester	morning-mixed
(SEM) Seminars	712	Catalan/Spanish	first semester	morning-mixed
(TE) Theory	71	Catalan/Spanish	first semester	afternoon