COURSE DATA

DATA SUBJECT

Code: 36831
Name: Histology
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1106 - Degree in Biology	Facultat de Ciències Biològiques	2	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1106 - Degree in Biology	Biología Celular y Tisular	COMPULSORY

COORDINATION

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SUMMARY

The subject Histology maintains a close connection with another subject, Cell Biology, where the student studied the cell as a structural and functional unit of living matter. In this course, the student studies two levels of higher biological organization: the cellular groupings that constitute animal and plant tissues, and the groupings of tissues that constitute organs. The study is approached from a morphological and functional perspective.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

No enrollment restrictions have been specified with other subjects in the curriculum, although it is recommended to have passed the subject of Cellular Biology in the previous year.

COMPETENCES / LEARNING OUTCOMES

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Be able to integrate knowledge of the structure and function of cells, tissues and animal and plant organs.

Be able to integrate the biological processes of energy production and cell signalling mechanisms.

Design and conduct experiments by using scientific techniques and instruments appropriately and complying with laboratory safety regulations.

Know how to obtain, process and analyse material of biological origin by applying histological techniques for light and electron microscopy.

Organise, plan and manage information in a manner that allows the individual to analyse, synthesise and develop critical reasoning that can be applied to solve problems, make decisions and carry out work.

Students must be able to apply their knowledge to their work or vocation in a professional manner and have acquired the competences required for the preparation and defence of arguments and for problem solving in their field of study.

Students must have developed the learning skills needed to undertake further study with a high degree of autonomy.

Use scientific language, both oral and written, and be able to adapt the register to the target audience and/or readers. Use the most common foreign languages in each discipline as a vehicle for communication in a globalised system.

DESCRIPTION OF CONTENTS

1. Plant Histology: Meristems and mature tissues

Primary and secondary meristems. Dermal tissues: epidermis and periderm. Parenchyma, collenchyma and sclerenchyma. Secretory tissues. Vascular tissues: xylem and phloem.

2. Plant organography

The leaf. The root. The stem.

3. Animal Histology: Epithelial tissue

The epithelial cell. Basal lamina. Lining epithelia and glandular epithelia.

4. Animal Histology: Connective tissue

Mesenchyme. Components of connective tissue cells and extracellular matrix. Adipose tissue.

5. Animal Histology: Skeletal tissues

Notochord. Cartilage. Cellular components and cartilage matrix. Cartilage histogenesis. Types of cartilage. Bone tissue: bone matrix and cell components. The osteon. Histogenesis, growth and remodelling of bone.

6. Animal Histology: Blood and lymph

Cell types. Haematopoiesis. Lymphocytes and immune system.

7. Animal Histology: Muscle tissue

Histogenesis. Skeletal muscle. Structure of the sarcomere. Motor unit: neuromuscular junction. Cardiac muscle. Smooth muscle.

8. Animal Histology: Nervous Tissue

Histogenesis. Structure of neurons: soma, dendrites and axon. Synapses. Glial cells: astrocytes, oligodendrocytes, Schwann cells and microglia.

9. Animal organography I. Vascular system

Capillaries, arteries and veins. The heart. Lymphatic vessels.

10. Animal organography II. Hematopoietic and lymphoid organs

Bone marrow. Spleen Thymus.

11. Animal organography III. Outer integument

Dermis and epidermis in vertebrates. Integumentary specializations in vertebrates. Sweat, sebaceous and mammary glands.

12. Animal organography IV. Digestive system

Mouth and oral organs. Esophagus, stomach, small and large intestine. Adnexal glands of the digestive tract: salivary glands, pancreas, liver.

13. Animal organography V. Respiratory apparatus

The trachea The lung.

14. Animal organography VI. Excretory apparatus

Structure of the kidney. Ureter. Urinary bladder

15. Animal organography VII. Reproductive system

Testicle Ducts and accessory glands. Ovary. Oviducts. Uterus

16. Animal organography VIII. Endocrine system

Pituitary and hypothalamic pituitary system. Epiphysis Thyroid and parathyroid. Endocrine pancreas. Adrenal capsule.

17. Animal organography IX. Sensory receptors

Chemoreceptors. Mechanoreceptors. The inner ear. The retina.

18. Animal organography X. Nervous system

Peripheral nervous system of vertebrates. Central nervous system of vertebrates: structure of the spinal cord, cerebellar and cerebral cortex.

19. Practical sessions

Plant tissues: dermal, ground and vascular.
Epithelial tissue. Epidermis and its appendages.
Connective tissue.
Adipose tissue.
Muscle tissue.
Skeletal tissues: cartilage and bone.

Blood. Hematopoietic and lymphoid organs.
Nervous Tissue.
The excretory system.
The respiratory system.
Endocrine organs. Digestive tube and glands.
Male reproductive system and female reproductive system.
Sense organs.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Tutorials	3,00
Theory	37,00
Laboratory	20,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	8,00
Independent study and work	82,00
Preparation of lessons	0,00
Preparation for assessment activities	0,00
Resolution of case studies	0,00
Total hours	**90,00**

TEACHING METHODOLOGY

The acquisition of the necessary knowledge by the student will be based on four basic pillars:

1. Theoretical lectures.

For approximately one hour, the teacher conveys to the student the knowledge of the subject with the support of teaching material suitable for each subject. In addition, student participation will be encouraged through questions or topics that spark debate.

The Aula Virtual platform will be used to provide the student with all the teaching material.

Here, tutorials are included for monitoring the students' level of learning. These are one-hour sessions to solve problems or deal with a topic of interest.

2. Laboratory classes.

In laboratory sessions lasting two hours, the student will analyse different preparations and photographs of optical and electron microscopy, guided by the teacher. The objective is for the student to recognize the different tissues and organs present in a collection of preparations processed with basic histological techniques.

3. Interdisciplinary Work: conducting and presenting a seminar (interdisciplinary seminar).

The activities of the subject are completed and complemented with the transversal activity "Interdisciplinary Seminars" directly focused on the work on competences. This is a cross-disciplinary activity common to all subjects in the second year of the degree in Biology (Histology, Evolutionary Processes and Mechanisms, Zoology II, Botany II, Biochemistry, Genetics, Paleontology, Developmental Biology, and Biostatistics). It consists of the preparation and presentation, by a working group (3 students), of a seminar, which will consist of a written text and an oral presentation. The activity is compulsory for all students enrolled in the second year, except for those who have done it before. Each working group prepares a seminar on a topic proposed by the teachers of the participating subjects. The assignment of each group to the subjects will be done by lottery. Each interdisciplinary work will thus be linked to the corresponding subject of the draw. A tutor will be assigned to each of the projects, who will supervise the completion of the project and supervise its presentation. To this end, a series of regular meetings will be held with the tutor throughout the course. A co-tutor will also be assigned, who will review the final version of the work submitted. Each paper will be presented orally by all members of the group for 30 minutes. The presentation will be attended by all students on the course, as attendance is compulsory, and by two lecturers: the tutor and a second lecturer. Both the students and the teachers will participate in the selection of the works that, due to their quality and originality, will be presented in the Biology Congress, held jointly between the first and second year of the Biology degree.

4. Student's off-site work.

Should be considered as all the work that the student engaged in the preparation of the course regardless of attendance at lectures, laboratory, seminars, tutorials and exams.

Are considered: a) the hours of study each week to be spent to expand and consolidate the knowledge acquired in class, b) the additional work that the teacher can plan for the student to perform throughout the semester as a complement to theoretical and practical sessions (eg. answering questionnaires).

EVALUATION

It will be considered the knowledge gained in theory, practice, and interdisciplinary activity. The course is divided into two "blocks of assessment" independent: theoretical and practical block (90%) and interdisciplinary activity block (10%). The evaluation of other activities (lectures, discussion of articles and current affairs ...), link, if appropriate, the evaluation of theoretical and practical block. If other activities are proposed to be carried out throughout the course, the activities will have a value of 10% in the final grade and the theoretical and practical block 80%.

Theoretical and laboratory block:

To assess knowledge of theory and practice block, the student will make two written exams: one theoretical and one practical, featuring a variety of question types or exercises. Optionally, an oral interview or additional questionnaire may be convened to confirm the qualifications rate.

To pass this block, students must earn a minimum of 5 points out of 10 in both examinations independently. When both tests are passed, the final mark for the block will be 80% of the theory mark and 20% of the practice mark.

If any of the two tests did not obtain a minimum of 5 out of 10, will be discontinued completely theoretical and laboratory block and therefore the course is suspended.

If only one of the two exams has been failed, the grade of the passed part will be saved for the next session of the same course. No grade is saved for the following course and, as a consequence, students who have not passed the subject must repeat the laboratory classes in subsequent registrations.

Interdisciplinary activity block:

The grade obtained in the interdisciplinary work will account for 10% of the grade for the subject. The tutor and an assistant lecturer (cotutor) will participate in the grading and will take into account both the oral presentation of the work and the written text. In these assessments, the relative weight of the tutor's and co-tutor's marks will be 60% and 40%, respectively. The evaluation of this activity will take into account both the scientific content and the way in which it has been presented, especially the ability to communicate and transmit ideas and concepts. The works selected for presentation at the Biology Congress will receive an extra mark, corresponding to 10% of the mark for the activity.

In the event of failing the course, the grade for the interdisciplinary work will be saved for the following year.

In the event that the interdisciplinary work (of a compulsory nature) is not carried out, this subject will be failed if it is the subject linked to this interdisciplinary work, regardless of the grade obtained in the rest of the subject.

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Basic references

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