Course Guide 2018/2019

Histology

Histología

Bachelor in Dentistry

Mode: On Campus

Index

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Histology

Module: **Biomedical Sciences.**

Subject: **Biology.**

Level: **Basic.**

No. of Credits: **6 ECTS.**

Academic Session: **1st Course – 2nd Semester.**

Course Professors: **Fernando Cánovas García, Severiano Rey Nodar** and **Inmaculada Conesa Fuente.**

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Professor coordinating the Module: **Sonia Sánchez Bautista.**

Brief Description

Histology is a theoretical and practical subject which (as its name implies: "*histo*" meaning tissue and "*logy*" meaning study) analyzes the microscopic structure of the various tissues, and its dependent relationship with their role, and its organization to form organs and systems that constitute the human anatomy. The concepts learned in this course, along with anatomical, physiological, and biochemical knowledge, will allow students to correctly recognize structures and their normal functional state as a basis to further evaluate abnormal structures and functions in future clinical practice.

Prerequisites

None.

Objectives

1. To analyze the normal organization of cells, tissues, and organs of the human being and to correlate their structure with their function.
2. To recognize the importance of the study of histological morphological functionality within the scope of its study, applying it later in the preclinical field during the study of the career, and finally in professional practice.
3. To analyze the normal organization of cells, tissues, and organs of the human being and to correlate their structure with their function.

4. To recognize the importance of the study of histological morphological functionality within the scope of its study, applying it later in the preclinical field during the study of the career, and finally in professional practice.

Competencies and Learning Outcomes

Basic competencies

MECES1: Students have demonstrated that they possess and understand the knowledge in an area of study that starts from the basis of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the forefront of their field of study.
MECES2: Students know how to apply their knowledge to their work or vocation in a professional manner and they possess the skills that are usually demonstrated through the elaboration and defense of arguments and through problem-solving within their area of study.
MECES3: Students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include a reflection on relevant issues of a social, scientific, or ethical nature.
MECES4: Students can transmit information, ideas, problems, and solutions to a specialized and non-specialized public.
MECES5: Students have developed the learning skills necessary to undertake later studies with a high degree of autonomy.

General competencies

G11: To understand the basic biomedical sciences on which Dentistry is based to ensure correct oral and dental care.
G12: To understand and recognize the structure and normal function of the stomatognathic apparatus at the molecular, cellular, tissue and organ levels in the different stages of life.

Interdisciplinary competencies

CT3: The ability to work as a team and to interact with other people in the same or different professional field.

Specific competencies

CBM1: To understand the biomedical sciences on which Dentistry is based to ensure correct oral and dental care. Among these, appropriate subject matter should include:

- Embryology, anatomy, histology and physiology of the human body.
- Genetics, biochemistry, molecular and cellular biology.
- Microbiology and immunology.

CBM2: To know the morphology and function of the stomatognathic apparatus, including specific appropriate subject matters of embryology, anatomy, histology, and physiology.

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Methodology

Methodology	Hours	Hours of Classroom Work	Hours of Non-Classroom Work
Classroom based Classes	30	60 hours (40 %)	
Academic Tutorials	6		
Practicums	15		
Seminars	6		
Classroom Evaluations	3		
Personal Study	63		90 hours (60 %)
On-line Tutorials	9		
Resolution of Exercises and Practical Cases	9		
Project Completion and Oral Presentations	9		
TOTAL	150	60	90

Syllabus

Theoretical instructional program

1. Introduction to Histology. Histological methods and techniques: general study methods of oral tissues. Optical microscopy. Electron microscopy. Techniques for soft tissues. Techniques for hard tissues. Concepts and classifications of tissues. The cell and the tissue.
2. Epithelial tissue. Glandular epithelia.
3. Connective tissue. Structure and components. Basal membrane.
4. Adipose tissue. The structure of adipose tissue. The adipocyte. Types of adipose tissue.
5. Bone tissue. Histological types. Cartilaginous tissue and its types.
6. Ossification. Types of ossification. The normal process of ossification.
7. Blood and blood vessels. Blood: Blood cells. Formation of blood cells: erythropoiesis, granulopoiesis, monopoiesis, lymphopoiesis, and thrombopoiesis. Bone marrow. The circulatory system: arteries, veins, capillaries.
8. Muscular tissue. Types of muscle: smooth muscle, striated muscle, cardiac muscle.
9. Nerve tissue. Glia. Nerve fiber. The central nervous system. The autonomic nervous system. The peripheral nervous system.
10. Formation, renovation, and aging of tissues. Tissue engineering. Types of tissue engineering: by cellular transfer, by induction, by elaboration of constructs. Guided tissue regeneration. Utilities and indications.

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11. The tooth and periodontium.
12. General and oral histogenesis.
13. Oral mucosa. Histological structure of the oral mucosa. Structural units that make up the oral cavity. Histological structure of the lips, cheeks, mouth floor, soft palate, hard palate, and oral mucosa. The lymphatic buccopharyngeal ring. The immune system: innate and acquired immunity. Antigens and antibodies. Histological structure of the palatine, pharyngeal, and lingual tonsils.
14. Odontogenesis.
15. Enamel and amelogenesis. Enamel. Histological structure of enamel. Basic and secondary structural units. Surface enamel coverings. Amelogenesis. The life cycle of ameloblasts. Formation and maturation of matrix.
16. Dentin-pulp complex. Structure, formation, and maturation. Pulp. Structural components of pulp: cells, fibers, fundamental amorphous substance. Areas of pulp. Dentin. Histological structure of dentin: basic and secondary structural units. Dentinogenesis: development of the dentin-pulp complex. The life cycle of odontoblasts. Formation of mantle, circumpulpar, and radicular dentin.
17. Periodontal insertion and protection. Structural components of cementum: cells and fiber. Types of cementum. The gums and the dentogingival junction. Histological structure of the gums. Histological structure of the dentogingival junction.
18. Periodontal ligament and alveolar bone. Cementogenesis and periodontogenesis. Structure of the periodontal ligament: cells, fibers, fundamental amorphous substance. Histological structure of the alveolar bone.
19. Joints and their types. Synovial joints. The temporomandibular joint: joint surfaces, joint disc, synovial membrane, synovial fluid and joint capsule.
20. Salivary glands. Minor salivary glands. Major salivary glands: Parotid gland, submaxillary gland and sublingual gland. Characteristics and differences of each one. Tongue: histological structure of the tongue. Lingual papillae. Taste corpuscles.
21. Dental eruption and dental movements. General mechanisms of dental eruption. Replacement of primary dentition. Differential characteristics between primary and permanent teeth.
22. Surface tooth covering.
23. Oral changes related to age.

Practical instructional program

The practicums will be held in the Practicum Room of the Histology laboratory of the University or in the computer room of the University in order to use the computer program Civagenius for a more interactive class with the students.

Virtually pre-scanned preparations of normal tissues of the different organs and systems that are explained in the theoretical classes will be uploaded, which will be referred to in the practicums discussed above. With a specific password, students will have access from their own computer or from the computer in the practicum room to those histological preparations that can be viewed as with a conventional microscope thanks to a computer program available for this purpose. The program includes a tool in which you can point and write text in the virtual preparations to make learning more interactive.

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General objectives:

- To develop in the student the necessary competencies to recognize the structure and characteristics of the different organs and systems that make up the human body.
- To analyze the special characteristics that the same sample shows with different coloring techniques.
- To understand and recognize the different tissue structures that make up a histological preparation.

Microscope Practicums (5 sessions of 3 hours each):

1. Epithelial tissue. Types of epithelia. Types of glands.
2. Connective tissue: adipose, muscular, nerve, cardiac, and osteocartilaginous.
3. The mouth. tongue. Salivary glands. Buccopharyngeal lymphatic ring. Synovial joint.
4. The tooth. The pulp, dentin, and enamel.
5. The periodontium: the cementum, periodontal ligament, and alveolar bone. The gums and the dentogingival junction.

Thematic seminars (3 sessions of 2 hours each).

The thematic seminars are aimed at developing a critical, creative perspective, with a focus on foundation training for research. These help develop the ability to collect information and assess it critically to try to solve problems by following the scientific method. The seminars also seek to develop the ability to work with new information, communication, bibliographic and iconographic search technologies and to acquire foundation training for research. Students will actively participate in the preparation and presentation of a topic. The students will form groups and, after adequate bibliographic and iconographic research, will present the topics on the syllabus of the subject or other related material. They will be held in the classrooms of the course.

Relationship to Other Courses of the Study Plan

Human Physiology. Pathological Anatomy. Cellular Biology. Human Anatomy and Embryology.

Grading System

For the June/September Sessions:

1. **Theoretical exams (60%):** Exams (or evaluative tests) will be carried out with theoretical-practical questions and resolution of assumptions that include the contents of the material studied.

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2. **Practical exams (30%):** The practicums and/or seminars will be evaluated through different grading systems (practical exercises, completion and exhibition of projects, clinical cases, etc.…) that include the practical content worked on.

3. **Academic tutorials (10%):** The student's participation will be evaluated though different means such as forums, chats, videoconferences, self-evaluations, activities proposed by the professor, and/or debates.

The student shall pass the subject when the weighted average is equal to or greater than 5 points and all the parts that make up the grading system have been passed, with an overall weight equal to or greater than 20%.

If the student has less than 5 in any of the parts with a weight equal to or greater than 20%, the subject will be suspended, and the student must retake the part(s) in the next session within the same academic year. The suspended part(s) in official sessions (February/June) will be saved for successive sessions that are held in the same academic year.

In the event that the subject is not passed in the September session, the passed parts will not count for successive academic years.

The grading system (RD 1.125/2003. of September 5) shall be the following:

0-4.9 Suspended (SS)

5.0-6.9 Passed (AP)

7.0-8.9 Excellent (NT)

9.0-10 Outstanding (SB)

Honorable mention may be granted to students who have earned a grade equal to or greater than 9.0. This number may not exceed 5% of the total number of students enrolled in a subject in the corresponding academic year, unless the number of students enrolled is less than 20, in which case only a single honorable mention may be granted.

Bibliography and Reference Sources

Basic Bibliography

- Gómez de Ferraris ME, Campos Muñoz A. Histología, Embriología e Ingeniería tisular Bucodental. [*Histology, Embryology, and Oral Tissue Engineering*.] Panamericana. 3ª edición. 2009.

Additional Bibliography

- Gartner LP. Histología básica. [*Basic Histology*.] Elsevier. 2011.

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- Stacy E. Mills. Histology for Pathologists. 4th Ed. (Revised Edition), WoltersKuwer, Lippincott Williams & Wilkins, 2012.
- Kierszenbaum y Tres. Histología y Biología celular. Introducción a la anatomía patológica. 3a ed. [*Histology and Cellular Biology. An Introduction to Pathological Anatomy. 3rd Ed*.] Elsevier-Saunder, 2012.

Related Websites

- https://histo.life.illinois.edu/histo/index.php
- http://histologyatlas.wisc.edu/archive/uw/histo.htm
- http://www.histology-world.com/contents/contents.htm#techniques

Study Recommendations

It is recommended to study the subject on a daily, continuous, and orderly basis, in order to keep up with the classes and seminars.

Teaching Materials

A lab coat is worn in the practicums working with microscopes. Access keys to the computer program Civagenius that allow for observation of histological preparations previously scanned from a computer or tablet as it were a microscope.

Tutorials

Brief Description

In academic tutorials, the focus will be to work on Decree No. 359/2009, of October 30th, which establishes and regulates the educational response to the diversity of students in the Autonomous Community of the Region of Murcia.

The activities that are carried out in the Academic Tutorials on this subject are:

- Personal orientation on the contents of the subject and the grading systems.
- Consolidation of knowledge, abilities, skills and attitudes of group work, and oral and written communication.
- Planning and promoting student learning through the provision of bibliographic and documentary sources.
- Advice on how to approach the activities of the practical seminars.

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The University also has a Special Body of Tutors that conducts personal tutoring with students enrolled in the degree. The personal tutor accompanies the students throughout the university phase. You can check the following link:

http://www.ucam.edu/servicios/tutorias/preguntas-frecuentes/que-es-tutoria

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