COURSE DATA

Data Subject	
Code	34444
Name	Special histology
Cycle	Grade
ECTS Credits	4.5
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
1204 - Degree in Medicine	Faculty of Medicine and Odontology	2	First term

Subject-matter

Degree	Subject-matter	Character
1204 - Degree in Medicine	2 - Human anatomy II	Basic Training

Coordination

Name	Department
SANCHO-TELLO VALLS, MARIA	285 - Pathology

SUMMARY

The program of the subject Special Histology involves the study in depth of the organisation and structure of tissues and organs that form the human body in the health state, taking into account that in the subject of General Histology, coursed during the first year of the degree, the microscope structures of the basic tissues (epithelial, conjunctive, muscular and nervous) that form the organs are studied. Thus, in this subject a detailed study of the structural characteristics of the different organs and systems is made: central and peripheral nervous, respiratory, circulatory, hematolymphoid, endocrine, digestive, urinary, genital systems, tegumentary and sense organs.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

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

Other requirements

General histology, cell biology, biochemistry, physiology and human anatomy.

OUTCOMES

1204 - Degree in Medicine

- Understand and recognise the structure and normal function of the human body, at the following levels: molecular, tissue, organic, and of systems, in each phase of human life and in both sexes.
- Understand and recognise the effects of growth, development and aging which affect individuals and their social environment.
- Know how to use the sources of clinical and biomedical information available, and value them critically in order to obtain, organise, interpret and communicate scientific and sanitary information.
- Know how to use IT in clinical, therapeutic and preventive activities, and those of research.
- In the professional practise, take a point of view which is critical, creative, constructive and research-oriented.
- Be able to formulate hypothesis, gather information and evaluate it critically in order to solve problems by following the scientific method.
- Establish a good interpersonal communication which may allow professionals show empathy and talk to the patients efficiently,as well as to their relatives, the media and other professionals.
- Proper organisation and planning of the workload and timing in professional activities.
- Team-working skills and engaging with other people in the same line of work or different.
- Criticism and self-criticism skills.
- Capacity for communicating with professional circles from other domains.
- Acknowledge diversity and multiculturality.
- Consideration of ethics as a fundamental value in the professional practise.
- Working capacity to function in an international context.
- Knows the cell structure and its function. Implication of biomolecules. Knows the metabolism, its regulation and metabolic integration.
- Knows the procedures in cell communication and the function of excitable cell membranes.
- Knows the procedures which take place in the cell cycle. Cell differentiation and proliferation.
- Knows the morphology, structure and function of skin, blood, organs and body systems: circulatory, digestive, locomotor, reproductive, excretory and respiratory systems; endocrine system, immune system, central and peripheral nervous systems.

- Knows the processes of growth, maturation and aging of the different organs and systems. Homeostasis. Adaptation to the environment.
- Handles material and the use of basic laboratory techniques.
- Recognises the morphology and structure of tissue, organs and systems through macroscopic and microscopic methods, and image techniques.

LEARNING OUTCOMES

1. Knowledge on concepts and structural characteristics of the different types of organs and systems. Morphological analysis of all their kinds.
2. Developing the ability to identify the structure of morphological organisations on images, which are theoretically described.
3. Acquiring skills to develop abilities for diagnosis at a microscopic level.

DESCRIPTION OF CONTENTS

1. THEORY

1. Brain. Cerebellum.
2. Spinal cord. Meningeal layers. Spinal ganglion. Autonomic nervous system. Autonomic ganglion. Peripheral nerve.
3. Sensory and motor nerve endings.
4. Respiratory system. Upper airways and olfactory system. Paranasal sinuses. Lung. Pulmonary spaces. Pulmonary alveolus. Pleura.
5. Cardio-circulatory system.
6. Lymphoid system. Timo. Bone marrow. Nodular and diffuse lymphoid tissue. Mucosa-associated lymphoid tissue.
7. Lymph node. Spleen.
8. Endocrine system. Hypophysis. Epiphysis.
9. Thyroid. Parathyroid. Diffuse neuroendocrine system.
10. Adrenal gland.
11. Oral cavity. Oral mucosa. Tongue. Teeth. Salivary glands.
12. General structure of the digestive tract. Pharynx. Esophagus. Stomach.
13. Small and large intestine. Appendix. Recto-anal canal. Pancreas.
14. Liver and biliary tract.
15. Kidney. Renal parenchyma. Nephron.
16. Renal vascularisation and juxtaglomerular apparatus. Renal interstitium. Urinary tract.
17. Genital system. Testicle. Spermatic ducts. Prostate. Male external genitals.
18. Ovary. Ovarian cycle. Fallopian tube.
19. Uterus. Endometrial cycle. Cervix. Vagina. Vaginal cycle. Female external genitals.
20. External tegumentary system. Epidermis. Dermis. Skin appendages. Mammary gland.
21. Eyeball.

22. Ear.

2. PRACTICES

LABORATORY PRACTICES

1. Organs of the nervous, respiratory and circulatory systems.
2. Lymphoid and endocrine organs.
3. Organs of the digestive and urinary systems.
4. Genital organs and senses.
5. Practical exam.

SEMINARS

1. Organs of the nervous, respiratory and hemolymphoid systems.
2. Organs of the endocrine and digestive systems.
3. Genitourinary organs, skin and senses organs.

DIAGNOSIS WORK-ORIENTED TURORED GROUPS

Identification of histological structures in a collection of microphotographic laminas (optic and electronic microscope).

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	25,00	100
Laboratory practices	10,00	100
Seminars	6,00	100
Tutorials	4,00	100
Development of group work	10,00	0
Development of individual work	10,00	0
Study and independent work	14,00	0
Readings supplementary material	2,00	0
Preparation of evaluation activities	14,00	0
Preparing lectures	10,00	0
Preparation of practical classes and problem	7,50	0
TOTAL	**112,50**	

TEACHING METHODOLOGY

In this subject 22.5 hours of theory lessons and 20 hours of practice lessons are combined. In the theory credits, the professor exposes the content, methods and techniques required for the development of the knowledge and skills that students must acquire. In the practice lessons, activities of laboratory of microscopy are carried out, where visualization of histological preparations of the different organs of our organism is performed. The training activities include the diagnosis of histological images, as well as the presentation of thematic seminars by the students, in order to develop the ability to work with the new information, communication and bibliographical research technologies.

Theory Lessons

They consist on the explanation of a topic by the teacher during 50-55 minutes. Through these lessons, both verbal and iconographic information is provided to a large number of students, saving times and resources, emphasizing the important aspects of the subject and deepening into the concepts of more difficult assimilation. In addition, in our discipline we can take advantage of the projection of histological images to try to make the students describe the images, thus facilitating their active participation. In order to make easier the follow-up of the speech during the lesson, the teacher can provide the students with a summary of the class, which is uploaded to Aula Virtual before the lesson.

Practice Lessons

The practices provide the student with a direct contact with the reality of the discipline, allowing them to learn the basic histological techniques and applying and developing the knowledge acquired in theory teaching, thus being useful at the same time to reinforce it. In our discipline, practice teaching acquires a major importance, given the morphological character of our subject, which requires a great visual learning. Therefore, the visualization of microscopy preparations and the handling of microscopy images, illustrations, diagrams and/or photographs help to understand the subject just as it does the text of a book or the theory lesson.

Within the practice teaching, there are various activities carried out in this subject: microscopy practices, thematic seminars and supervised work groups and guided diagnosis.

Microscopy practices

They constitute a teaching element of first order in our discipline since they allow the autonomous personal observation, although supervised, of the histological tissues and organs using the microscope. The microscopy practices are carried out in groups of 40 students, supervised by several teachers, which allows a more personalized and smoother teacher-student relationship. Each student has a microscope and a tray with the preparations that will be studied in each practice.

The teacher observes with the microscope the same preparation that the students will observe, and projects images of it, while explaining the characteristics and objectives of each histological preparation, providing the students with practical advice on how to approach them. Then the students observe the preparation in their microscope, consulting the teachers all the aspects that they consider, as well as the difficulties and curiosities that these preparations may cause them. Voluntarily (however, this might be assessed), students develop a personal notebook of practices, where they reflect their observations, considering the usefulness of the activity itself and the possible future use that can be made of this notebook as a complement of the theory lessons.

There are four microscopy practices, two-hours long each, which are carried out after the subject matter in each of the sessions has been exposed in the theory lessons.

Thematic seminars

The seminar is based on the exposition by a group of students (generally 4 or 5) of a topic which covers complementary aspects to the theory lessons and the practice lessons of microscopy, covering also subjects in which there has not been an in-depth study of the theory lessons, either a histological structure itself or considering modifications and normal variants of these structures. Related to this last point, it is emphasized that they should search for information regarding possible age variations or, from the point of view of gender perspective, potential differences depending on the sex of the individual. In addition, they must dedicate a part of the presentation (about at least 20% of it) to presenting and explaining at least one research paper, published in a scientific journal in English, related to that histological structure or to Tissue Engineering studies performed on it. The structure of the seminars differs radically from the theory lessons, since the students are the speakers and therefore the active actors in the exchange of knowledge and, where appropriate, the discussion of what has been shown, always with the aim of stimulating participation and critical approaches. The students, as has been indicated previously, in groups of 4 or 5, prepare a topic related to subject of study (proposed by the teachers) and expose it to their classmates and two teachers, who will asses it. In this practice activity the self-learning is encouraged, as well as the ability to work in teams, the critical search for contrasted information, communication skills and the defense of ideas. Although tutored and guided by the teacher, the students are those who have the initiative.

The seminars are held in groups of 40 students (those who correspond to a group of practices) and are developed in three sessions of two hours each, in which the 9 topics selected by the teachers from all the topics in the theory syllabus (3 in each session), are exposed, chosen in a balanced way considering the syllabus and the moment which they should be both prepared and exposed. The presentation must be adjusted to 30 minutes, so that each student has an average of 6-7 minutes to present his/her part.

Apart from assessing the work done by each group of students (through an individual assessment of each of its components), the assessment of this practice activity includes five questions related to the topics discussed in the thematic seminars.

Supervised work groups and guided diagnosis

This practice work is developed in 3 sessions of 80 minutes each. In them, two different activities are carried out. The first one consists in supervising the groups with respect to the topic of the seminar that they will present, indicating them the aspects that they must address or look for information of, where they can find that information and how to select it, helping them realize that their task must really be a group work and not a sum of individual works, etc.

The second activity consists on an guided diagnosis of various histological images. The students are provided with a series of images in advance, which they must analyze and interpret based on the knowledge acquired in the theory lessons and the other practice activities, through searching and comparing them with images from books and histological atlases, etc. The histological images are obtained from preparations observed both with light and electron microscopy, with various staining techniques, both conventional and more specific, and immunohistochemistry, with the aim that the student can differentiate the different aspects of tissue structure and assess how the image obtained from the histological structure varies depending on the technique used for its preparation and in its observation. During the three sessions all the images are studied in depth, and they should preferably be described and

analyzed by the students, since this activity should be a participatory one, which requires that the student perform, prior to the sessions, the analysis and study of them.

EVALUATION

The final mark will be established by the joint evaluation of activities and written and oral tests performed in relation to the theoretical and practical content. The content of the written test will be the same for all groups.

Theoretical assessment

It will be the 60% of the final mark. It will carried out by a written test about the content of the theoretical program and it will aim to evaluate the acquisition of knowledge:

- 4 points: 40 multiple choice test (5 possible answers, 1 true/4 false). Assessment criteria: 0,1 points/right answer; 0,025 points will be subtracted by each wrong answer.
- 2 points: 4 written questions of limited extension. Assessment criteria: from 0 to 0,5 points/question.

Practical assessment

It will be the 40% of the final mark. It will be carried out by evaluating the observation and analysis of preparations and microscopic images, the presentation of thematic seminars and the continuous assessment of the participation on the different activities. The acquisition of skills related with the general and specific competencies will be evaluated:

- 1 point: recognition of 5 histological structures of the preparations studied in the practices of microscopy (0,2 points/structure), by a *compulsory* practical exam.
- Up to 1 point: exposition of a thematic seminar.
- Up to 0,5 points: continuous assessment by the elaboration of a notebook of practices.
- 1 point: diagnosis of 20 structures from the microphotographic laminas (0,05 points/structure; 5 possible answers, 1 true/4 false). Assessment criteria: 0,05 points/right answer; 0,0125 points will be subtracted by each wrong answer.
- 0,5 points: 5 multiple choice test referring to the thematic seminars (0,1 point/problem; 5 possible answers, 1 true/4 false). Assessment criteria: 0,1 points/right answer; 0,025 points will be subtracted by each wrong answer.

The subject will be passed with a mark equal to or greater than 5, as long as it is achieved at least 3 points in the theoretical part and 2 points in the practical one.

To qualify for the Honors it is compulsory that the student has presented the laboratory notebook and that this one has been favorably qualified.

Attendance to practical sessions is mandatory. Unjustified non-attendance to more than 20% of the sessions will make it impossible to pass the course.

Students are reminded of the importance of carrying out evaluation surveys on all the teaching staff of the degree subjects.

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