Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: No
Some groups entirely in Spanish: No

Contact

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Teachers

Vicente Aige Gil
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Prerequisites

There are no official prerequisites, although it is convenient that the student has passed the subjects of Morphology I and Structure and Function of the Nervous System, which are taught in the second semester of the first year of the Veterinary Degree. The contents of Morphology II are complemented with those of the subject of Physiology, which is taught simultaneously in the second year of the degree.

Objectives and Contextualisation

Morphology II is a basic subject of the second year of the Veterinary Degree that contributes to getting the student to know the structure, organization, and function of the organs, apparatuses, and systems that compose the animal organism, both throughout the development of the individual as in his adult stage. In particular, the subject of Morphology II focuses on the study of the circulatory system and the respiratory, digestive, urinary and genital apparatuses, in addition to the endocrine glands. It is explained from the development of the different organs until its anatomy in the adult. The subjects of Morphology I, Structure and Function of the Nervous System and Physiology complement the contents of the structure and function of the set of apparatuses and systems of the body of the animal.
The formative objectives of the subject are:

- To understand the development of the circulatory system, the respiratory, digestive and urogenital apparatuses, and the endocrine glands, the basic concepts of the mechanisms that control their embryonic development as well as the etiology and the meaning of developmental anomalies.

- To understand the form, the macroscopic structure, the disposition and function of the organs that make up the circulatory system, the respiratory, digestive and urogenital apparatuses, and the endocrine glands, in the different species of veterinary interest.

- To understand the microscopic structure of the different organs that compose the circulatory system, the respiratory, digestive and urogenital systems, and the endocrine glands, in the different species of veterinary interest.

- To use the embryological, histological and anatomical terminology correctly and appropriately.
- To use embryological, anatomical and histological knowledge as a basis for the study of other preclinical and clinical subjects. This knowledge will form the basis for the correct understanding of physiology and pathology.

- To access and to use critically information sources on embryology, anatomy, and histology in an autonomously and adequately.

Competences

- Comunicar la informació obtinguda durant l'exercici professional de manera fluida, oralment i per escrit, amb altres col·legues, autoritats i la societat en general.
- Demonstrate knowledge and understanding of structural and functional disorders of the animal organism.
- Demonstrate knowledge and understanding of the structure and functions of healthy animals.
- Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

Learning Outcomes

1. Communicate information obtained during professional exercise in a fluid manner, orally and in writing, with other colleagues, authorities and society in general.
2. Construct different animal organs by selecting and relating basic tissues.
3. Describe changes to tissue components of organs and relate them with the functionality of the organ.
4. Explain the basic concepts of the mechanisms that control the embryonic processes.
5. Explain the etiology and meaning of developmental anomalies.
6. Microscopically identify animal tissues and organs.
7. Recognise and explain the form, structure, layout and relationships of the organs, apparatus and systems of animals of veterinary interest.
8. Recognise and explain the origin and organisation of the structure of animals during their development.
9. Relate the composition and the structure of tissues with their functions.
10. Use anatomical and embryologic knowledge to solve problems of a veterinary nature.
11. Use the correct and suitable embryologic and anatomical terminology.
12. Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

Content
The learning process of the contents of the subject needs an integrated boarding
throughout the attendance to masterclasses and practical sessions, as well as self-learning.

The theoretical and practical contents are detailed below:

Circulatory System


• Adult heart. Pericardium. The microscopic structure of the heart: fibrous and membranous structures, myocardium. Cardiac morphology. Compartments, openings, and valves. Relationships of the heart inside the thorax. Microscopic structure.

• Vascularization and innervation of the heart. Conducting autonomic system of the heart.


• Lymphatic organs. Nodules and lymphatic vessels. Lymphatic centers. Thoracic duct, spleen, and thymus: development, morphology and microscopic structure; Comparative anatomy.

General splanchnology


• Vascularization of the head. Lymphatic centers. Motor and sensory innervation of the head.

Endocrine glands

• Thyroid and parathyroid: morphology, microscopic structure, anatomical relationships; vascularization and innervation.

• Adrenal glands: development, morphology, microscopic structure, anatomical relationships; vascularization and innervation. Other endocrine tissues.
Respiratory apparatus


Digestive tract


• Oral cavity. Lips, gums, hard palate, and soft palate. Microscopic structure. Intrinsic and extrinsic muscles of the tongue; vascularization and innervation.


• Salivary glands. Classification, morphology, microscopic structure and anatomical relationships. Vascularization and innervation. Comparative anatomy.

• Pharynx. Parts, microscopic structure, anatomical relationships, vascularization, and innervation. Tonsils and other lymphoid formations.

• Derivatives of the caudal portion of the anterior primitive intestine. Esophagus: development, microscopic structure, parts, relationships, vascularization and innervation, comparative anatomy. Abdominal cavity. Peritoneum: development, microscopic structure and disposition; greater omentum and minor omentum, omental bursa and omental orifice.


• The stomach of ruminants. Development, morphology, microscopic structure and anatomical relationships. Vascularization and innervation.


• Vascularization, lymphocenters and intestinal innervation. Comparative anatomy.

Urogenital apparatus

• Development of the gonads and genital ducts. Undifferentiated period and evolution in the male and female. Congenital malformations.
• Mammary glands: development and comparative anatomy. Description of the breast of the cow: morphology and microscopic structure. Vascularization and innervation.

Birds
• Anatomy of birds. Comparative osteology. Organs of the body cavity. Microscopic structure

Methodology

The methodology used during the teaching and learning process is based on the student efficiency analysing the information that our team made available through different means. The main role of the teacher is to help the student, not only giving information, but also directing and supervising the learning process. The course is based on the following activities:

Masterclasses: The student acquires the scientific knowledge of the discipline. The student must complete this knowledge with the personal and autonomous study of the topics explained.
Practical sessions: Practical sessions approach the theoretical models to reality and reinforce, complete and allow applying the knowledge acquired in masterclasses. At the beginning of the course, the student will receive a practical guide describing the contents studied in each session. In practical sessions, the students grouped in small groups will study dissections, bones, preparations of isolated organs, models, x-rays, histological preparations, etc. Throughout the observation of these specimens, the student will acquire a three-dimensional concept of the structural disposition, required to understand, for example, the relationships among the different organs inside the body cavities, or the distribution of vessels and nerves. In practical sessions, the student will also develop manual dexterity and skills, such as curiosity and observation.

Collaborative learning: During the practical dissection sessions, students will work in small groups to dissect the head and body cavities. As part of this learning, and if enough cadavers are available to carry out the practices, the possibility of evaluating the quality and detail of the different dissections made by the group will be considered.

The student's learning will be monitored through different evaluative tests in continuous assessment, including dissection and microscopy. These tests will evaluate the understanding of practical sessions and the integration of theoretical contents acquired in master classes. The student will also be examined in 5 synthesis tests during the semester.

The materials used in the subject will be available on the Moodle platform.

Activities

<table>
<thead>
<tr>
<th>Title</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type: Directed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laboratorial sessions (including collaborative learning)</td>
<td>78</td>
<td>3.12</td>
<td>1, 3, 6, 8, 7, 12, 11</td>
</tr>
<tr>
<td>Master classes</td>
<td>38</td>
<td>1.52</td>
<td>2, 3, 4, 5, 6, 8, 7, 9, 10, 11</td>
</tr>
<tr>
<td><strong>Type: Supervised</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presentation of the subject</td>
<td>1</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td><strong>Type: Autonomous</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autonomous learning</td>
<td>102</td>
<td>4.08</td>
<td>2, 4, 6, 8, 7, 9, 12, 10, 11</td>
</tr>
</tbody>
</table>

Assessment

The evaluation will be performed continuously along the course, for the better monitoring of the teaching and learning processes, encourage the continuous effort during the semester and verify that the competences assigned to the subject are achieved. The student's final grade will be calculated from the average of all his partial grades. The course will be approved with a final grade of 5 or higher.

Continuous evaluation of the practices:
- Attendance at practical sessions will be controlled.
- There will be 5 controls or evaluation tests throughout the semester. Two controls about Anatomy, two controls about histology and one about the integrated practice.
- The realization of these controls is mandatory.
- A minimum score of 4.5 points out of 10 is required in the two Histology controls. Depending on the availability of cadavers, the quality of the dissections performed by each group of students could be positively evaluated.

- The marks obtained in these tests will represent 10% of the final grade of the subject (also for students repeating the course).

Practical exams: To achieve the aim that the student integrates the contents of the different practical blocks, two practical oral eliminatory examinations will be carried out, before each of the two scheduled partials.

- The first exam will include the circulatory system, the general splanchnology and the respiratory apparatus. It will be carried out using isolated organs and the dissections of the head and the thoracic cavity.

- The second exam will include the digestive tract, the urinary apparatus and the genital apparatus. Similarly, using isolated organs of the different species and the dissections of the abdominal and pelvic cavities.

- The two exams will be performed in the dissection room, on the specimens used during the practical sessions. These two practical exams will represent 45% of the final grade of the subject.

- The fluid, orderly and reasoned exposure of the answers will be positively valued.
- The two exams are eliminatory, so you will need a minimum score of 4.5 points out of 10 in both exams to be able to take the theoretical exams, as well as to be able to do the rest of the grades and be able to pass the course.

Written evaluations: There will be two multiple-choice partial examinations. Both will be carried out after the practical exams and will include the same devices and systems as the practical ones.

- These exams will worth 45% of the final grade of the subject.
- The grade will be weighted in relation to the number of theoretical classes taught. A minimum grade of 4.5 points out of 10 will be required in each of these exams to be able to make the average with the rest of the grades and be able to pass the subject. The theoretical examinations will allow evaluating the integration of the theoretical knowledge with those acquired in the practical sessions and the ability to analyze and relate concepts.

Students who do not pass any of the practical or theoretical exams will have the opportunity to retrieve them during the exam recovery period at the end of the semester.

Not presented students: The student who has not been made any partial exam, including theoretical or practical ones, will be considered as Not Presented. The student who made one partial exam but not further exams will be considered Failed.

Assessment Activities

<table>
<thead>
<tr>
<th>Title</th>
<th>Weighting</th>
<th>Hours</th>
<th>ECTS</th>
<th>Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual controls along the course on microscopy and dissection</td>
<td>10%</td>
<td>0</td>
<td>0</td>
<td>6, 7, 12, 11</td>
</tr>
<tr>
<td>Oral practical exams (two partial exams) in the dissection</td>
<td>45%</td>
<td>2</td>
<td>0.08</td>
<td>1, 7, 11</td>
</tr>
</tbody>
</table>
Written examinations (two partial exams) | 45% | 4 | 0.16 | 2, 3, 4, 5, 6, 8, 7, 9, 10, 11

Bibliography

Textbooks of Anatomy


Textbooks of Embryology


Textbooks of Histology


Atlas of Anatomy


Atlas of Histology


Cd's of Histology

- Digital Microscopy Lab (DML): Histologia Bàsica i Organografia Microscòpica (Natura-Project)

- Weather's Functional Histology, 4ª Ed. (B. Young i J.H. Heath)

- Texto Atlas de Histología, 2ª Ed., (L.P. Gartner i J.L. Hiatt)

- Color Textbook of Histology 3ª Ed. (Gartner L.P. y Hiatt J.L. Saunders/Elsevier Ed.

- El microscopi virtual a Histología sobre bases biomoleculares, (Genesser)

- Di Fiore's Atlas of Histology, 12ª Ed. (V.P. Eroschenko, Lippincott Williams & Wilkins)

Links to webs of Anatomy


- Atlas de anatomía de especies silvestres de la Amazonia peruana http://atlasanatomiaamazonia.uab.cat/

- Web de neuroanatomia: www.neuroanatomyofthedog.com


Links to webs of Histology

- [http://zyx.freeservers.com/histo/histo.htm](http://zyx.freeservers.com/histo/histo.htm). Histology World It is a website where you can find all kinds of information related to Histology: books, journals, publications, collections, laboratories, etc. as well as links to all other websites.