

## **Surgery and Anaesthetics**

Code: 102675  
ECTS Credits: 8

**2024/2025**

Degree	Type	Year
2502445 Veterinary Medicine	OB	3

### **Contact**

Name: Javier Moll Sanchez

Email: xavier.moll@uab.cat

### **Teachers**

Felix Angel Garcia Arnas

María Teresa Peña Giménez

Marta Prades Robles

David Prandi Chevalier

Jaime Miguel Martorell Monserrat

Cristina Costa Farré

Marta Leiva Repiso

Anna Maria Andaluz Martinez

### **Teaching groups languages**

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

### **Prerequisites**

There are no official prerequisites to take the subject, although it is advisable that students have taken and passed Morphology I, Morphology II and Structure and Function of the Nervous System and Physiology.

### **Objectives and Contextualisation**

The subject of General Surgery and Anesthesia is a compulsory third year subject that introduces to students for the first time in the study of surgical treatment diseases and in anesthesiology. It is essential and basic for subsequent clinical studies. He teaches the basics of asepsis, wound treatment, skin reconstruction and the handling of surgical equipment as well as different suturing techniques. In addition, it lays the foundations for clinical anesthesia and analgesia in different animal species and the fluid therapy techniques common in the surgical patient.

The training objectives of the subject are:

- Have knowledge of pathophysiology applied to surgical diseases
- Know and be able to respect the concept of asepsis and sterile area in the operating room.
- To know in a theoretical and practical way the most commonly used suturing techniques and materials.
- Recognize and know how to use basic surgical instruments appropriately.
- Be able to use the usual anesthetics and anesthesia machine.
- Be able to monitor an anesthetized animal.
- Be able to use the most common skin reconstructive surgery techniques.
- Know the basics of fluid therapy and be able to apply it to the clinical situations explained.

## Competences

- Apply scientific method to professional practice, including medicine
- Attend to emergencies and perform first aid in veterinary science.
- Collect, preserve and issue all types of samples with the corresponding report.
- Comunicar la informació obtinguda durant l'exercici professional de manera fluïda, 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 general bases of medical and surgical treatments.
- Make clinical records and accurate and complete clinical exploration of animals.
- Perform the most common medical and surgical treatments of animals.
- Prescribe and dispense medicines correctly and responsibly in accordance with legislation, and ensure that the medicines and waste are stored and eliminated properly.
- Properly apply the principles of sterilisation of surgical equipment and the principles of surgical asepsis.
- Safely perform sedations and regional and general anaesthesia, and evaluate and control the pain.
- Treat and handle animals in a safe and humanitarian manner, and instruct other people to properly employ these techniques.
- Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

## Learning Outcomes

1. "Choose the most suitable suture materials for each intervention; type of material and thickness and type of needle."
2. Apply any measures needed to restrain animals: protecting the veterinarian without causing them injury or stress, and be aware of the risks involved in handling animals.
3. Apply haemostasis and drainage techniques.
4. Apply scientific method to professional practice, including medicine
5. Communicate information obtained during professional exercise in a fluid manner, orally and in writing, with other colleagues, authorities and society in general.
6. Define the bases for the treatment of wounds and their complications.
7. Describe the methods for administering hospital nutrition.
8. Distinguish the bases of fluidotherapy and apply them to the explained clinical situations.
9. Employ the most common reconstructive surgery techniques.
10. Explain the cardiopulmonary resuscitation techniques to be applied to anaesthetic complications.
11. Explain the methods of disinfection and sterilisation and their limitations.
12. Explain the surgical pathology of different systems of the organism.
13. Identify biopsy techniques applicable for obtaining samples from different organs and tissues, as well as knowing their limitations, complications and methods to preserve samples and enable later analysis.
14. Identify the anaesthetic particularities of different animal species.
15. Identify the limitations on the use and prescription of some anaesthetic and/or analgesic agents.
16. Interpret the principles for the manipulation of tissue and surgical dissection, as well as the concept of atraumatic surgery.

17. Monitor animals during anaesthesia.
18. Perform pre-anaesthesia estimations of surgical patients.
19. Perform the most frequent suture techniques, as well as knotting techniques with suture materials.
20. Properly recognise, order, pass, take and use general surgical instruments.
21. Properly use and wear a cap, mask and gaiters without losing the sterility of the surgical gown and gloves (open and closed techniques).
22. Recognise the generalities of post-operation cures applicable to any type of surgery.
23. Respect the concept of asepsis and sterile area in the operating theatre.
24. Secure animals before examinations, treatment or sample taking, causing the minimum possible stress.
25. Show knowledge of pathophysiology applied to surgical diseases.
26. Use anaesthesia apparatus.
27. Use anaesthetics and analgesics.
28. Work effectively in single or multidisciplinary teams and show respect, appreciation and sensitivity for the work of others.

## Content

### *Theoretical contents:*

#### BLOCK 1: ANESTHESIA (15 hours)

The theoretical contents of this block will be taught during the first semester in face-to-face format.

Topic 1: Pre-anaesthetic assessment. Patient preparation.

Topic 2: Anaesthetic premedication.

Topic 3: Pain I: Pain pathways. Opioid painkillers.

Topic 4: Pain II: NSAIDs. Postoperative analgesia. Neuroleptanalgesia.

Topic 5: Concept of general anaesthesia. Injectable anaesthetic agents.

Topic 6: Maintenance of general anaesthesia. Inhalation anaesthesia.

Topic 7: Ventilation - General concepts. Spontaneous ventilation, physiology. Mechanical ventilation  
Complications mechanical ventilation. Neuromuscular relaxants.

Topic 8: Monitoring I (respiratory).

Topic 9: Monitoring II (cardiovascular).

Topic 10: Anaesthetic complications. Cardiopulmonary resuscitation.

Topic 11: Loco-regional anaesthesia.

Topic 12: Anaesthetic considerations in dogs and cats.

Topic 13: Anaesthetic considerations in small mammals.

Topic 14: Anaesthetic considerations in ruminants and pigs.

Topic 15: Anaesthetic considerations in horses.

#### BLOC 2: GENERAL SURGERY (15 hours)

The theoretical contents of this block will be taught during the second semester in face-to-face format.

Topic 16: Introduction. Principles of surgical asepsis. Sterilization and disinfection. Asepsis in the operating room, equipment and staff. Preparation of the surgical patient.

Topic 17: Surgical material. Types and use. Tissue manipulation. Surgical dissection. Classification of surgical interventions.

Topic 18: Haemostasis. Drains.

Topic 19: Sutures I: Generalities and indications. Instrumental. Suture materials. Techniques, indications.

Topic 20: Sutures II: Types of sutures. Practical applications. Complications of sutures.

Topic 21: Trauma: phases of healing. Types of wounds. Thermal and electrical burns. Bite wounds. Treatment protocols.

Topic 22: Bandages.

Topic 23: Biopsy taking. Oncological surgery (resection of tumours, margins...). Cryosurgery and laser techniques. Principles and indications.

Topic 24: Postoperative management of surgical patients: generalities, complications and their treatment. Surgical infections. Choice of antibiotic.

Topic 25: Feeding (enteral-parenteral nutrition).

Topic 26: Cutaneous reconstructive surgery I (tension lines, pendants).

Topic 27: Cutaneous reconstructive surgery II (flaps, grafts).

Topic 28: Fluid therapy I.

Topic 29: Fluid therapy II.

Topic 30: Fluid therapy III.

*Practical contents:*

- GENERAL SURGERY INTERNSHIP (LABORATORY): internships of 2 hours each.
  - PRACTICE 1: Surgical block. Asepsis. Behaviour in the operating room. Instrumental.
  - PRACTICE 2: Sutures I. Approximation and eversion.
  - PRACTICE 3: Sutures II. Inversion sutures. Empty viscera.
  - PRACTICE 4: Skin reconstruction.
  - PRACTICE 5: Biopsies. Placement of drains. Feeding tubes. Catheters.
  - PRACTICE 6: Wound care. Bandages.
- ANESTHESIA PRACTICES: 4 hours face-to-face workshops + anaesthesia in OHE (4 hours) + Module (20 hours).
- ANESTHESIA WORKSHOPS (LABORATORY): Workshop of two hours each. These workshops will be taught in face-to-face format.
  - WORKSHOP 1: Routes of administration, IV line placement, infusion pump operation, blood draw, continuous infusions.

- WORKSHOP 2: Operation of the anaesthesia machine and systems, endotracheal intubation, oxygen administration with a tube or mask.

- ANESTHESIA PRACTICES [ANESTHESIA MODULE 1 WEEK AT FHCV (20 HOURS)] in small groups.
- ANESTHESIA PRACTICE IN OHE (4H) in small groups.

*Self-learning:*

Material uploaded to the virtual campus before the internship (It is mandatory to consult it before coming to the internship) + activities related to the theoretical classes.

## Activities and Methodology

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Autoaprendizaje	24	0.96	4, 5, 10, 15, 14, 17, 23, 24, 28, 21, 27, 26
Practical teaching	12	0.48	1, 3, 6, 9, 11, 13, 16, 19, 22, 20, 23, 21
Practical teaching. Anesthesia practices (practice laboratory)	4	0.16	10, 17, 28, 26
Theoretical teaching.	30	1.2	1, 3, 6, 25, 7, 8, 9, 11, 12, 10, 15, 14, 13, 16, 17, 19, 22, 20, 23, 24, 21, 27, 26
Type: Autonomous			
Practical teaching	40	1.6	8, 15, 14, 17, 27, 26
Theoretical teaching	86	3.44	1, 3, 6, 25, 7, 8, 9, 11, 12, 10, 15, 14, 13, 16, 17, 19, 22, 20, 23, 21, 27, 26

Learning will be taught in a combined way, with theoretical teaching given in the form of master classes and practical teaching. In this way, the bases will be provided that the students will have to expand with the reading and consultation of the appropriate bibliography. This teaching will also be the basis for students to be able to solve clinical cases in an appropriate way.

The teaching material used in the subject will be available on the Virtual Campus platform - moodle classrooms.

### **Theoretical teaching. Classes.**

The master classes will be taught with the help of power point diagrams so that students can follow the explanations. Due to the importance of the practical content of this subject, the presentations will often be accompanied by videos.

The necessary and basic information will be given so that, later, the knowledge and learning can be completed with the consultation of appropriate texts.

### **Practical teaching.**

The practical sessions serve to apply and fix the knowledge that students have acquired in theory, also allowing them to develop the ability to observe and the ability to integrate knowledge.

General surgery and anaesthesiology practices (laboratory).

The practical classes will consist of 2-hour sessions in the laboratory and will be carried out on biological models or cadavers.

*Anaesthesia:* these are workshops aimed at making students aware of the basic procedures before interacting and performing them on a live animal.

*Surgery:* First of all, the techniques of asepsis and behaviour in the operating room (practice 1) and suturing techniques (practices 2 and 3) will be taught. Subsequently, plastic surgery (practice 4), basic surgical procedures (practice 5) and wound and bandage care (practice 6) will be carried out.

Anaesthesia (module) and OHE practices.

In the practices at the HCV, patients who have to undergo sedation or general anaesthesia will be treated directly (either to be operated on or to perform other complementary tests or procedures). In these practices you will learn the main anaesthetic techniques and the correct monitoring in the different animal species (especially dogs and cats) as well as the postoperative care to be provided to surgically treated animals.

### **Self-learning work.**

Students will develop and solve cases, discussing them among classmates and teachers. With regard to cases of anaesthesia, the daily cases that exist during the week of the module will be discussed.

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
Evaluation of anesthesia practices (10%) and continuous evaluation of master classes (10%)	20%	1	0.04	4, 5, 7, 15, 14, 13, 17, 28, 27, 26
Partial written test - Block 1 (the note will include the continuous assessment of the topics taught by David Prandi).	30%	1	0.04	10, 15, 14, 17, 24, 27, 26
Partial written test - Block 2	30%	1	0.04	1, 3, 2, 6, 9, 11, 13, 16, 19, 18, 22, 20, 23, 28, 21
Practical test	30% of the final grade	1	0.04	1, 3, 6, 25, 7, 8, 9, 11, 12, 13, 16, 19, 22, 20, 23, 21

This subject does not provide for the single assessment system.

The assessment will take place throughout the academic year, which will allow the teaching and learning process to be monitored, encourage continuous effort throughout the semester and verify whether the competences assigned to the subject in the curriculum are achieved.

In order to be able to add up or obtain the final grade, it is necessary to have independently passed both the practical exam and the two theoretical exams. Likewise, attendance at internships and self-learning is mandatory. Practices and self-learning are also mandatory for repeating students without exception. As indicated below, unjustified absence from the practices or failure to carry out self-learning implies failing the subject.

Written exams. There will be two partial written exams (one for block 1 and one for block 2). The written exams will account for 60% of the final grade of the subject (the two exams have the same weight, that is, each exam will represent 30% of the final grade). A minimum grade of 5 points out of 10 will be required in each of these exams to be able to average the other grades and pass the subject. The written exams will allow to evaluate the integration of theoretical knowledge with that acquired in the practical sessions of the subject, the ability to relate concepts and analysis and, in short, show the final maturity of the students.

***Students who have not carried out any of the practices of the subject or the self-learning activities will not be able to take the theoretical exams.***

Practical exam: a practical exam will be held. This exam will account for 20% of the final grade of the subject. The exam assesses the acquisition of knowledge and skills. In the exam the following grades can be obtained:

- Failed = has not reached the minimum skills. The subject will be suspended.
- 0.1- 2 points on the final grade: depending on the skills you have acquired.

***Students with unjustified absences in the practices of the general surgery block will not be able to take the practical exam*** and will have the subject failed.

Anaesthesia practices: attendance at all practices is mandatory to pass the subject (also for repeating students without exception). Anaesthesia practices account for 10% of the final grade.

During the OHE and module practices, students will have to know and know how to do all the points explained during workshops 1 and 2 as well as the theory. Lack of knowledge of these points will imply a score of 0 in this part of the grade.

Self-study work: 10% of the final grade. Self-study work is compulsory and includes:

- Preparation of laboratory practices independently with the material deposited by the teaching staff before attending the practice. During the practice, self-learning will be valued. Those who do not carry out the indicated self-learning will not be able to attend the practice and it will be recorded as not carried out.
- The topics of block 2 (general surgery) taught by David Prandi will include COMPULSORY self-study activities. Failure to carry out these activities implies not being able to take the theoretical exam of the general surgery block.

Students who do not pass the practical exam or any of the two partial written exams will have the opportunity to recover them during the end-of-semester exam period.

Practice controls and self-study assignments are not recoverable and failure to complete these parts implies failing the subject.

Anyone who has taken a midterm exam and then does not take any more exams will be considered as failed.

Students who have completed less than 15% of the assessable activities of the subject will be considered non-assessable.

## Bibliography

### ANESTHESIA

Analgesia and anesthesia for the ill or injured dog and cat. (2018) Mathews KA, Sinclair M, Steele AM, Grubb T.

BSAVA manual of canine and feline anaesthesia and analgesia. 3th ed. (2016) Duke-Novakovski T, de Vries M, Seymour C.

Canine and feline anesthesia and co-existing disease. 2nd ed. (2022) Johnson RA, Snyder LBC, Schroeder CA.

Equine anesthesia: monitoring and emergency therapy. 2nd ed. (2008) Muir WW, Hubbell JA.

Farm animal anesthesia: cattle, small ruminants, camelids, and pigs. 2nd ed. (2022) Lin H, Passler T, Clark-Price S.

Feline anesthesia and pain management. (2018) Steagall PVM, Robertson SA, Taylor P.

Handbook of small animal regional anesthesia and analgesia techniques. (2016) Lerche P, Aarnes T, Covey-Crump G, Martinez-Taboada F.

Veterinary anaesthesia. 11th ed. (2014) Clarke KW, Trim CM, Hall LW.

Veterinary anesthesia and analgesia, the fifth edition of Lumb and Jones. 5h ed. (2015) Grimm KA, Lamont LA, Tranquilli WJ, Greene SA, Robertson SA.

Veterinary anesthetic and monitoring equipment. (2018) Cooley KG, Johnson RA.

Zoo animal and wildlife immobilization and anesthesia. 2nd ed. (2014) West G, Heard D, Caulkett N.

### SURGERY

Atlas de anatomía del perro y del gato. 2a ed. (2002) Ruberte J, Sautet J, Navarro M, Carretero A, Pons J.

Atlas of small animal wound management and reconstructive surgery. 4th ed. (2018) Pavletic MM.

BSAVA Manual of canine and feline abdominal surgery (20216) Williams, J, Niles, J.

BSAVA manual of canine and feline oncology. (2011) Dobson JM, Lascelles BDX.

BSAVA manual of canine and feline surgical principles: A Foundation Manual. (2012) Baines S, Lipscomb V, Hutchinson T.

BSAVA manual of canine and feline wound management and reconstruction. 2nd ed. (2009) Williams JM.

Small animal soft tissue surgery. 2nd ed. (2023) Monnet E.

### Software

Not necessary



## Language list

Name	Group	Language	Semester	Turn
(PLAB) Practical laboratories	1	Catalan/Spanish	annual	morning-mixed
(PLAB) Practical laboratories	2	Catalan/Spanish	annual	morning-mixed
(PLAB) Practical laboratories	3	Catalan/Spanish	annual	morning-mixed
(PLAB) Practical laboratories	4	Catalan/Spanish	annual	morning-mixed
(PLAB) Practical laboratories	5	Catalan/Spanish	annual	morning-mixed
(PLAB) Practical laboratories	6	Catalan/Spanish	annual	morning-mixed
(TE) Theory	1	Catalan/Spanish	annual	afternoon
(TE) Theory	2	Catalan/Spanish	annual	afternoon